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PEOPLE'S REPUBLIC OF BENIN
MINISTRY OF PLANNING, STATISTICS AND ECONOMIC ANALYSIS

VOLUME 6
AGRO-ECONOMIC DATA
ATACORA

**SOCIO-ECONOMIC PROJECT FOR THE
DEVELOPMENT
OF
ONCHO-FREE AREAS**

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PEOPLE'S REPUBLIC OF BENIN

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VOLUME 6: AGRO-ECONOMIC DATA

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VOLUME 6

ATACORA

AGRO-ECONOMIC DATA

I. INTRODUCTION

The data presented in this document are the raw results of the agricultural-economic survey conducted between April 1981 and April 1982 in the province of ATACORA in the context of the Socio-economic Study Project for the Development of Areas Free of Onchocerciasis (ATACORA/BORGOU).

The purpose of this survey is to determine the main components of the structures of agricultural family farms. To do that, the following will be identified:

- The make-up of agricultural households,
- The characteristics of the heads of farms,
- The physical features of the farms,
- Agricultural work and labor force utilization,
- Non-agricultural activities,
- Tools and agricultural equipment: farm loans,
- Livestock inventory and animal husbandry management methods,
- Cultivation practices,
- Crop products,
- Main crop surfaces and yields.

The sample on which our survey was conducted was made up on two levels: the villages, and the agricultural households. We selected 60 villages at random in the province and then 12 agricultural households in each village. The essence of our survey base was made up of the results of the 1979 national census. For further details on the methodology employed, please refer to Volume 1.

II. CONCEPTS AND DEFINITIONS

To facilitate the unambiguous interpretation of survey results, we will begin with a presentation of the definitions and the concepts relating to the statistical units employed in this study.

Household

A household is a group of persons generally comprising a man (family head), his wife or wives and his children who work, live, and take their meals together. In the developing countries, such as the People's Republic of Benin, the family may extend to friends or other relatives (brothers, sisters, cousins, etc.). The household may also be reduced to a single person (unmarried person without children and without collateral relatives) or two persons (a couple without children and without collateral relatives).

Agricultural Farm

According to the recommendations of the United Nations Organization for Food and Agriculture (F.A.O.), "a farm is any land used entirely or partly for agricultural production and which is considered an economic unit operated by a single

person or a person accompanied by other persons regardless of the ownership title, the legal system, the size, or the specific location".

Head of Farm

This is a person who takes care of the development of the farm and makes current decisions regarding farm management. For family farms in general, the farm head is often also the head of household.

Persons Active in Agriculture

We considered any person from the age of 15 on up, who exercises an agricultural activity, regardless of whether it is full-time or part-time, to be a person active in agriculture.

Family Manpower

These are members of the household who work on the farm. The family manpower comprises the father (farm head), the wife or wives of the farm head, his children, as well as other relatives or other person (visitors) who help the farm head during operations on the farm without any compensation, be it in money or in kind.

Wage Labor

This is the manpower that is paid directly in money by the farm head and who furthermore may or may not receive payment in kind, such as meals, etc.

Mutual Aid

This is a form of work organization constituted by an association of young farm workers. The work is done by turns on the fields of each of the association's members. Any members who benefit from this aid must, in turn, put in an equivalent number of working days.

Field

A field is a piece of land belonging to a single owner, included in the same farm and bordered either by a road, a branch channel, or by the field of another farm.

Plot

This is a part of the field with a single crop or combination of crops. In the case of shrub or perennial crops, a plot shall be part of the plantation with trees in the same age bracket.

Concept of Proportional Surface

Difficulties are generally encountered in the evaluation of crop surfaces when it comes to the conversion of surface areas covered by mixed crops into fewer crops. In this document we tried partly to get around the problem by using the so-called "proportional surface" method. This method consists of calculating the percentage in the number of feet of each crop with relation to the total number of feet of mixed crops contained in a crop density square. According to the nature of crops, this square must be sufficiently large to contain at least 30 feet of each kind. We determine the surface pertaining to each crop by means of the distribution of the mixed-crop surface in proportion to each crop.

Ways of Farm Acquisition

The land constituting the entire farm can come from several possible origins. In the context of our study, we selected the following origins:

- Loan
 - Inheritance
 - Purchase
 - Custom-based allocation
 - Metayage (share cropping)
 - Rent
 - Mixed
 - Part-owner.
-
- Loan: when all of the farmland was temporarily ceded to the farmer without any kind of recompense.
 - Inheritance: when all of the farmland was received according to a legacy by any relative.
 - Purchase: when all of the farmland was acquired in return for payment in cash (money) or in kind.
 - Custom-based allocation: when all of the farmland was given either by the village chief or by the farmland head, according to the region's custom.
 - Metayage (share cropping): when all of the land belongs to another person to whom the farmer must each year turn over a portion of his harvest.
 - Renting: When all of the farmland was temporarily ceded to the farmer without any kind of recompense.

- Mixed: When all of the land is covered by several of the following categories: loan, custom-based allocation, sharecropping, renting.
- Part-owner: When the farmer is the owner of at least a portion of the farm.

III. DATA ANALYSIS

A. General Information on Population of Agricultural households

1. Farm Population

To keep track of population growth, we made a census of the people in the households surveyed at the beginning and the end of the survey.

As we can see in Table 1, we detect a drop in the household population at the end of the survey. This drop is quite noticeable among the active and partly in the category of children between 7 and 14 years of age.

We thus record a drop of 4.4% compared to the initial population at the start of the survey. This imbalance undoubtedly is an indication of a certain flight from the farm among the active population.

An agricultural household comprises an average of 8.2 persons. This average size varies from one district to the next and also according to nationalities. It is 5.9 in the district of BOUKOUMBE and it varies up to

13.2 in the district of KOUANDE. Looking at the nationalities, the DENDI and BARIBA groups are the strongest population segments, respectively, with 11.9 and 11.4 persons per household. The OTAMMARI group, one of the dominant nationalities in the province, has an average size of 6.6 individuals per household.

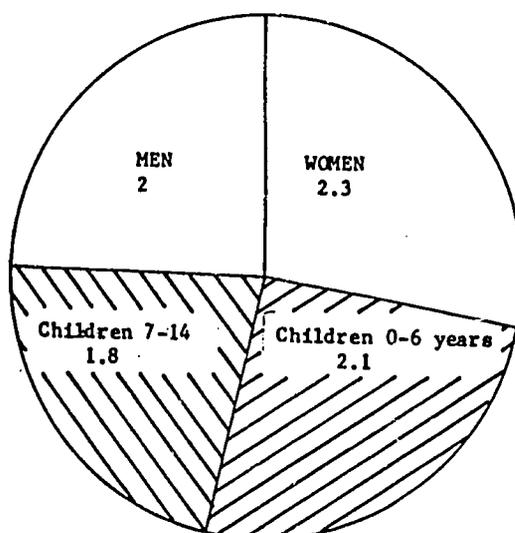
2. Makeup of Agricultural Households

The following tables sum up the characteristics relating to the farm population by districts, by nationalities and at the province level.

MAKEUP OF FARM HOUSEHOLDS
(AVERAGES BY DISTRICT)

DISTRICTS	MEN		WOMEN		FARM WORKERS		CHILDREN (7-14 yrs)		CHILDREN (0-6 yrs)		MEAN AVERAGE	
	1981	1982	1981	1982	1981	1982	1981	1982	1981	1982	1981	1982
BASSILA	1.9	1.9	2.7	2.7	4.6	4.6	2.5	2.4	2.6	2.7	9.6	9.7
BOUKOUMBE	1.8	1.6	1.7	1.8	3.5	3.4	1.1	1.1	1.4	1.4	5.9	5.9
COBLY	1.8	1.6	2.3	2.3	4.1	3.9	1.3	1.4	2.6	3.0	8.0	8.3
COPARGO	2.0	1.9	2.2	2.0	4.2	3.9	1.6	1.7	1.9	2.0	7.7	7.6
DJOUGOU URBAIN	2.0	1.8	2.4	2.3	4.4	4.1	1.8	1.8	1.7	2.0	7.9	7.9
DJOUGOU RURAL	2.5	2.0	3.1	2.3	5.6	4.3	2.2	1.7	2.6	2.2	10.4	8.1
KEROU	3.4	2.8	3.4	3.6	6.8	6.4	2.4	2.4	3.4	3.5	12.5	12.4
KOUANDE	3.3	2.7	3.3	3.1	6.6	5.8	3.5	3.4	3.1	3.5	13.2	12.8
MATERI	1.3	1.3	1.9	1.8	3.1	3.1	1.3	1.4	2.1	2.0	6.7	6.6
NATITINGOU	1.4	1.3	1.8	1.6	3.2	2.9	1.5	1.5	1.6	1.6	6.4	6.1
OUAKE	2.0	2.0	2.6	2.5	4.6	4.5	2.0	1.9	2.1	2.4	8.8	8.9
PEHUNCO	1.8	1.6	2.4	2.2	4.2	3.8	1.4	1.4	2.0	2.2	7.5	7.4
TANGUIETA	1.7	1.8	1.8	1.7	3.5	3.5	1.7	2.0	2.0	2.1	7.1	7.4
TOUCOUN-TOUNA	1.9	1.6	2.3	2.0	4.2	3.6	1.4	1.3	1.8	1.8	7.4	6.7
PROVINCE ATACORA	2.0	1.8	2.3	2.2	4.3	4.0	1.8	1.7	2.1	2.1	8.2	7.8

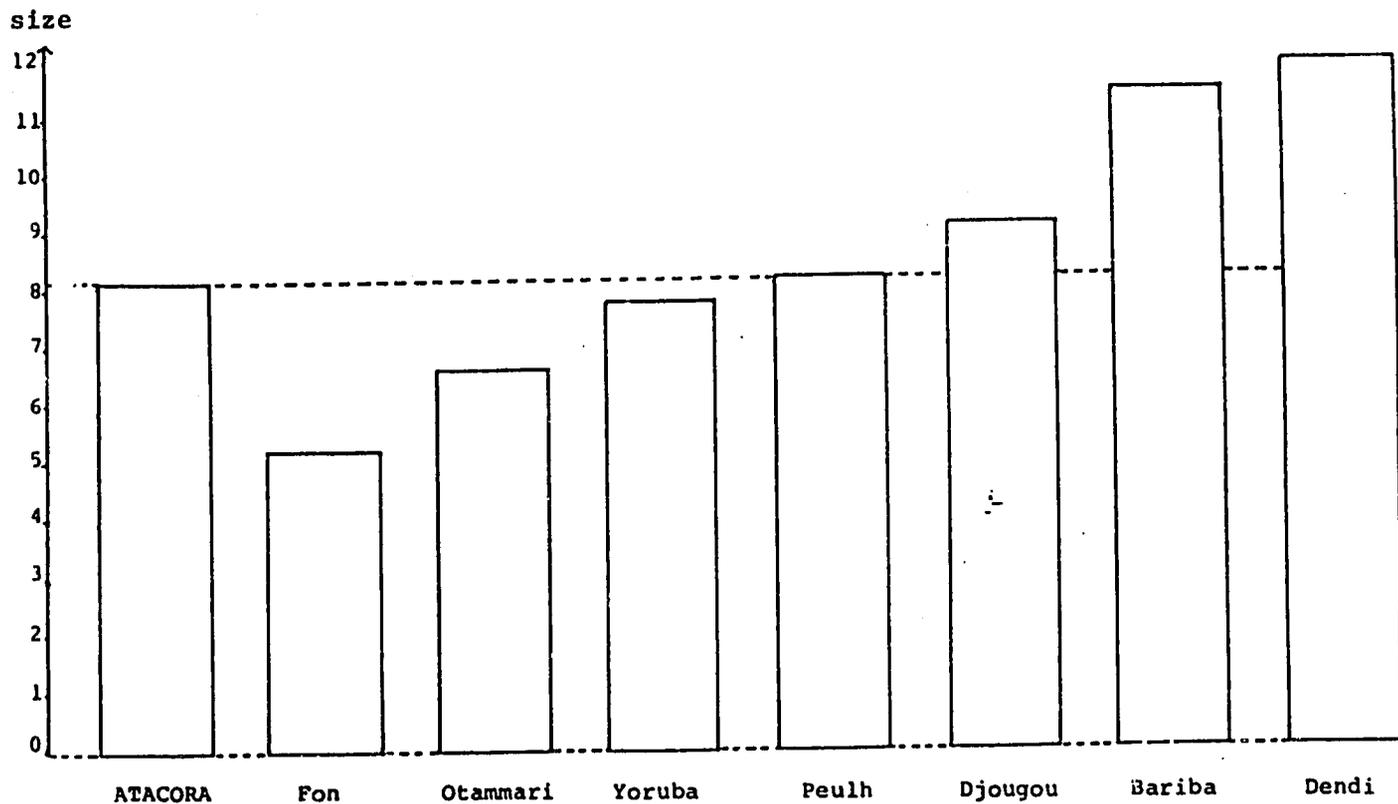
**GRAPHIC ILLUSTRATION OF THE AVERAGE MAKEUP
OF FARM HOUSEHOLDS**



**MAKEUP OF FARM HOUSEHOLDS
(AVERAGES BY NATIONALITIES)**

NATIONALITIES	MEN		WOMEN		FARM WORKERS		CHILDREN (7-14 yrs)		CHILDREN (0-6 yrs)		MEAN AVERAGE	
	1981	1982	1981	1982	1981	1982	1981	1982	1981	1982	1981	1982
FON	1.2	1.2	1.5	1.3	2.7	2.5	0.8	0.8	1.7	2.2	5.2	5.5
BARIBA	3.3	2.8	3.3	3.0	6.6	5.8	2.2	2.1	2.6	2.8	11.4	10.6
DENDI	2.6	2.0	3.0	2.9	5.6	4.9	3.3	3.2	3.0	3.4	11.9	11.6
DJOUGOU	2.2	1.9	2.7	2.3	4.9	4.2	2.0	1.8	2.2	2.2	9.1	8.2
PEULH	1.8	1.7	2.4	2.4	5.2	4.1	2.0	2.0	2.1	2.4	8.2	8.6
OTAMMARI	1.6	1.5	1.9	1.8	3.5	3.3	1.3	1.4	1.8	1.8	6.6	6.5
YORUBA	1.5	1.4	1.9	1.8	3.4	3.2	2.3	2.0	2.1	2.2	7.8	7.4
MISC.	3.4	3.5	4.6	4.6	8.0	8.1	3.3	3.4	3.8	3.8	15.1	15.3
PROVINCE ATACORA	2.0	1.8	2.3	2.2	4.3	4.0	1.8	1.7	2.1	2.2	8.2	7.8

AVERAGE SIZE OF HOUSEHOLDS BY MAIN NATIONALITIES



The population is distributed as follows by age groups:

47.3% of population in households surveyed are under the age of 15. We note the predominance of women (15 years and over) over men (15 years and over). This difference however is not significant since we record a per-household average of 2.3 women against 2.0 men in the same age group (15 years and over). With the exception of the districts of KEROU and KOUANDE, where the men and women are found in equal proportions, there are more women than men in the other districts.

3. Active Population

Referring to our definition of active individuals in agriculture, we find that persons (men and women) of 15 years and over represent 50.1% of the population residing in the households surveyed. Here we have an average of 4.3 active individuals per farm household on the provincial level. This average varies from one district to the next and also according to nationalities: it is 3.1 active individuals in the district of MATERI and it varies up to 6.6 in the district of KOUANDE. The BARIBAS and DENDI groups reveal the strongest averages, with respectively 6.6 and 5.6 active individuals per household. We can thus say that the labor supply varies with the family group's makeup. In other terms, it is the large-size households that have the highest per-household active individual averages. It must however be noted that the children (boys and girls between 7 and 14) participate or are liable to participate in agricultural activities at one time or another throughout the year and this age group accounts for 21.5% of the population. Pending the availability of more detailed studies on the determination of man equivalent coefficients of the labor force as relating to children in this same age group, we can, tentatively, note that the essential part of the per household labor force potential is made up of 71.6% of the resident population.

4. Other Population Data

a. Population's Water Supply

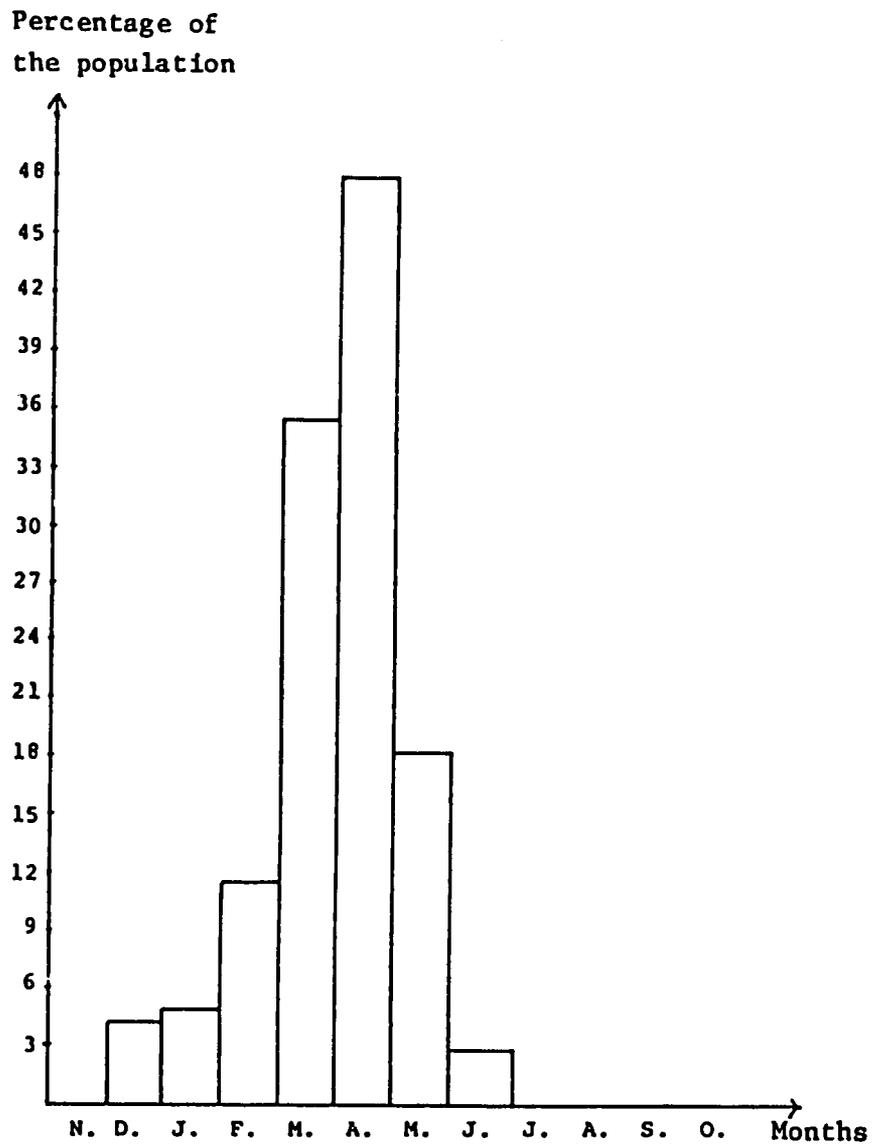
Generally speaking, the water supply problem exists throughout the province. More than half of the

households surveyed declared that they do not have enough water throughout the year (Table 12). The problem does not come up with the same degree of seriousness from one district to the next. Thus, on the basis of the percentage of households that get enough water or do not get enough water, we divided the districts into three categories:

- (1) the districts where more than half of the households surveyed get enough water throughout the year, are the districts of KEROU, PEHUNCO, KOUANDE, COPARGO and TANGUIETA.
- (2) the districts where more than half of the households do not get enough water, are the districts of MATERI, DJOUGOU RURAL, BASSILA, COBLY and DJOUGOU URBAIN, and NATITINGOU.
- (3) the districts where the water problem is serious and where less than 30% of the households surveyed get enough water are the districts of BOUKOUMBE, TOUCOUNTOUNA, and OUAKE.

The households surveyed suffer from a water shortage, especially during the period between December and May; this period furthermore coincides with the period of the dry season (Table 13). Apart from some districts, most of the water supply is of rainfall origin. The population is very sensitive to the water problem, especially during the months of March and April, as we can see in the following graph.

**PERCENTAGE OF HOUSEHOLDS EXPERIENCING WATER SHORTAGE
PER MONTHS**



b. Distance between Home and Watering Point

Most of the households surveyed are near the watering point. About 86% are less than 1 km from the watering point and the average distance to be covered is 0.700 km. There are only a few cases where the distance is more than 1 km (Table 31) We do not note any significant difference between the districts. However, the districts of BOUKOUMBE and MATERI show the largest percentages of households located more than 1 km away (34.2 and 50.7%, respectively).

c. Distance between Home and Closest Periodic Market

The markets are located in the immediate vicinity of the homes in more than half of the households surveyed (60.3%). The average distance to be covered is 2.2 km. In the districts of MATERI, TOUCOUNTOUNA, and TANGUIETA, the average distances are greater than the average for the province. In these districts, distances can vary from 7 to more than 10 km (Table 32).

d. Distance between Home and Health Center

A little more than 50% of the households are located in the immediate vicinity of the health centers; 22% of the households must cover a distance of between 1 and 3 km and 11% must cover a distance of more than 10 km. The average distance to be covered is 3 km. The situation is more serious in the districts of BOUKOUMBE and MATERI where a good part of the

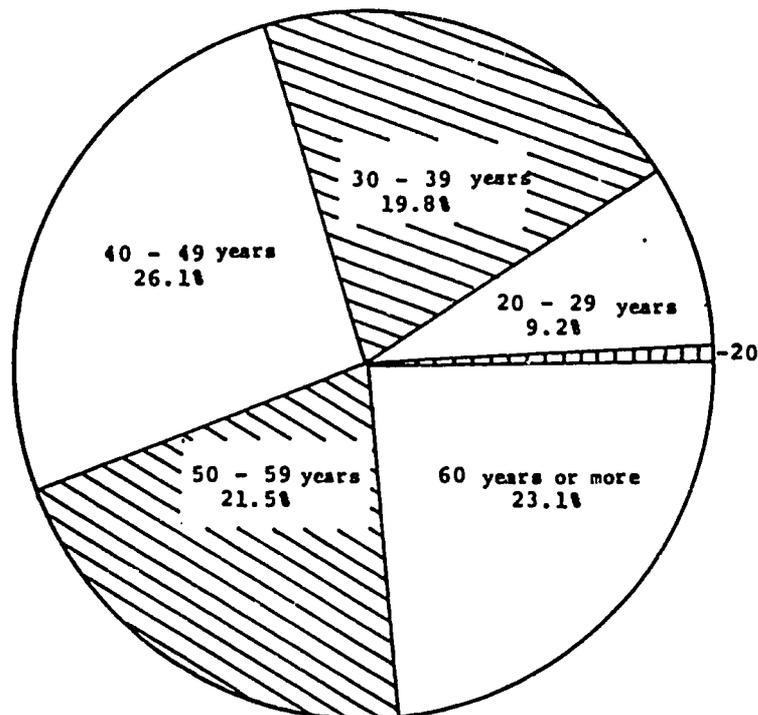
households surveyed (41 - 63%) must cover between 7 and more than 10 km before gaining access to a health center (Table 34).

B. Characteristics of Farm Household Heads

1. Age of Household Heads

The distribution of farm household heads by age groups (Table 6) shows the large share of age groups between 30 and 49 years and 50 years and over, in other words, 45.1% and 44.6%, respectively. The age group of less than 30 years is relatively small with a share of less than 10%. The mean and mode ages are, respectively, 48 years and 45 years. Among the 44.6% of household heads over the age of 50, 23%, or a little more than half, are over the age of 60.

**RELATIVE IMPORTANCE OF HOUSEHOLD HEADS
BY AGE GROUP**



Among the PEULH group we find the highest proportion of farm heads between the ages of 30 and 49 years (63%), followed by the OTAMMARI group (51.9%). The DJOUGOU group shows the highest percentage of individuals 50 years and over (56%), among whom more than 35% are 60 years and older. It is followed by the BARIBA group (51.8%), where 33.3% belong to the 60 years and over age group.

2. School Attendance and Education Level of Farm Household Heads

The majority of farm heads surveyed (93%) did not receive any formal education. Only 7% among them declared that they went to school, including a little more than 4% who attended school between 4 and 6 years. These percentages do not vary in an appreciable fashion and are not significant either from one district to the next, or from one nationality to the next (Table 7).

Concerning literacy, both in French and in national language, we find roughly the same percentage. Thus, 6% of the farm household heads know how to read and write in French and 5.4% know how to read and write in national languages. As in the case of school attendance, there are no significant differences either on the district level or on the nationality level (Tables 8 and 9).

3. Origins of Farm Heads

To determine the origin of farm heads, we used the criterion of birthplace when it differed from the district of current residence. As shown in Table 10, the majority of household heads surveyed was born in their

district of current residence (86.6%). There is no significant difference between the districts or between the nationalities. However, special mention must be made concerning the districts of TANGUIETA and TOUCOUNTOUNA where close to 42% of the farm household heads in each of these districts come from other districts in the province. The two districts thus show the highest percentages of non-natives and can be considered as receiving districts.

The districts of KOUANDE, BOUKOUMBE, and OUAKE show the highest percentages of locally born individuals and certainly constitute areas where immigration is lowest.

Looking at the nationalities, it is the YORUBA and the PEULH who show the highest degree of mobility. Concerning the FON nationality and the nationalities grouped under the term "OTHERS" (miscellaneous), we cannot deduce anything from the high percentage of non-natives in view of the very small number of observation data.

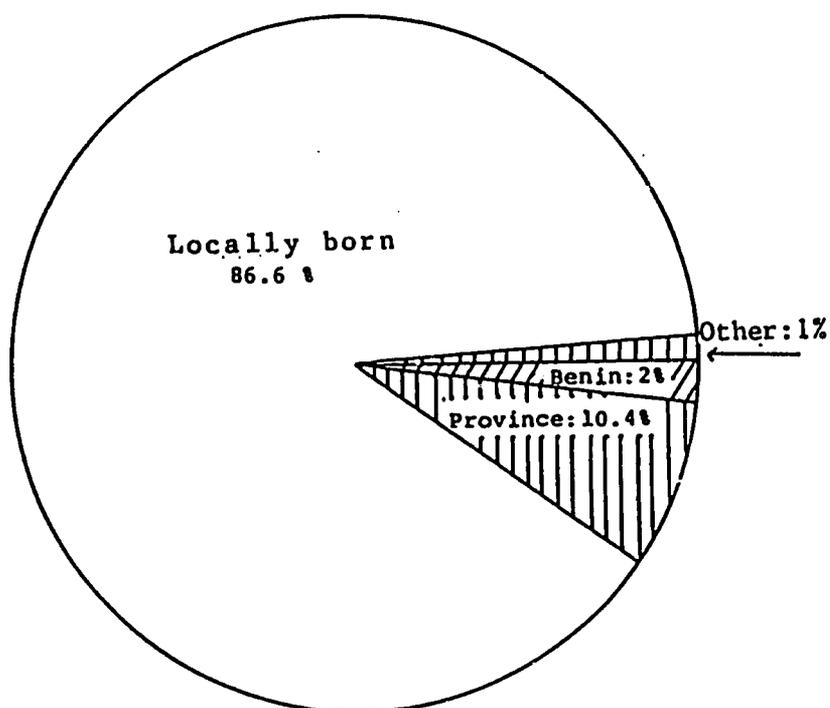
DISTRIBUTION OF FARM HEADS ACCORDING TO ORIGIN
BY DISTRICT

DISTRICTS	ORIGINS (%)				TOTAL
	LOCAL	PROVINCE	OTHER REGION OF BENIN	OTHER	
BASSILA (N = 46)	78.3	13.0	8.7	0.0	100.0
BOUKOUMBE (N = 95)	98.9	1.1	0.0	0.0	100.0
COBLY (N = 36)	72.2	16.7	2.8	8.3	100.0
COPARGO (N = 48)	93.8	6.3	0.0	0.0	100.0
DJOUGOU URB. (N = 23)	87.0	0.0	13.0	0.0	100.0
DJOUGOU RUR. (N = 84)	82.1	15.5	2.4	0.0	100.0
KEROU (N = 24)	95.8	0.0	0.0	4.2	100.0
KOUANDE (N = 35)	100.0	0.0	0.0	0.0	100.0
MATERI (N = 71)	90.1	7.0	0.0	2.8	100.0
NATITINGOU (N = 60)	83.3	13.3	3.3	0.0	100.0
OUAKE (N = 48)	97.9	0.0	0.0	2.1	100.0
PEHUNCO (N = 36)	94.4	5.6	0.0	0.0	100.0
TANGUIETA (N = 24)	54.2	41.7	4.2	0.0	100.0
TOUCOUNTOUNA (N = 36)	58.3	41.7	0.0	0.0	100.0
ATACORA (N = 666)	86.6	10.4	2.0	1.1	100.0

**DISTRIBUTION OF FARM HEADS ACCORDING TO ORIGIN
BY NATIONALITY**

NATIONALITIES	ORIGINS (%)				TOTAL
	LOCAL	PROVINCE	OTHER REGION OF BENIN	OTHER	
FON (N = 6)	66.7	16.7	16.7	0.0	100.0
BARIBA (N = 54)	92.6	1.9	5.6	0.0	100.0
DENDI (N = 25)	100.0	0.0	0.0	0.0	100.0
DJOUYOU (N = 176)	92.6	5.7	1.1	0.6	100.0
OTAMMARI (N = 316)	85.1	13.6	0.9	0.3	100.0
YORUBA (N = 31)	74.2	19.4	6.5	0.0	100.0
PEULH (N = 40)	77.5	15.0	5.0	2.5	100.0
MISC. (N = 17)	64.7	11.8	0.0	23.5	100.0
ATACORA (N = 665)	86.6	10.4	2.0	1.1	100.0

GRAPHIC REPRESENTATION OF THE ORIGIN OF
AGRICULTURAL HOUSEHOLDS, AT THE PROVINCE LEVEL



C. Physical Features of Agricultural Farms

Before presenting the survey's results on the physical features of the farm, we think that it is necessary to recall the methodology followed in the particular context of the calculation of surface areas and yields. This will facilitate the effort to combine the results of this survey and those of the surveys conducted earlier in the same zone.

The fields and plots were measured and density squares were laid out according to the methodology used by the Research and Planning Directorate of the Ministry of Rural Development and Cooperative Action.

The farm field inventory was prepared and in a schematic fashion by means of a sketch which makes it possible to identify these fields with relation to the farm head's residence. The survey of the fields and the measurement of surface areas involved are a part of the more delicate operations of the survey dealing with the structure of the farms, whose success depends on the farmer's goodwill and on the interviewer's degree of professional ability.

The farmer might not declare all of his fields, either out of distrust or because of the interviewer's poor conduct. It might also happen that the farmer, for reasons of a cultural nature, resists the idea of laying out a yield grid in this field. Due to lack of goodwill, the interviewer might fail to measure the fields that are somewhat further removed from the farmer's domicile. All of these are factors which can affect the validity of the survey results.

To minimize these errors it is necessary to have a team of conscientious controllers and dynamic supervisors. When we began this survey in March 1981, all arrangements had been made. The two regional supervisors left the survey to attend a training course in France, unfortunately, at the time when the measurement operations began. They were not replaced until 4 months later. During that period of 4 months, the controllers and interviewers were left to their own devices and supervision was no longer continuous as we wanted it to be. The results regarding the surface areas, which are presented in this document, are not devoid of such errors in the field in spite of the on-the-spot corrections which were made.

Contrary to the Research and Planning Directorate, we converted the mixed crop surface areas into single crop areas according to the proportional surface method which we explained in the paragraph dealing with definitions and concepts.

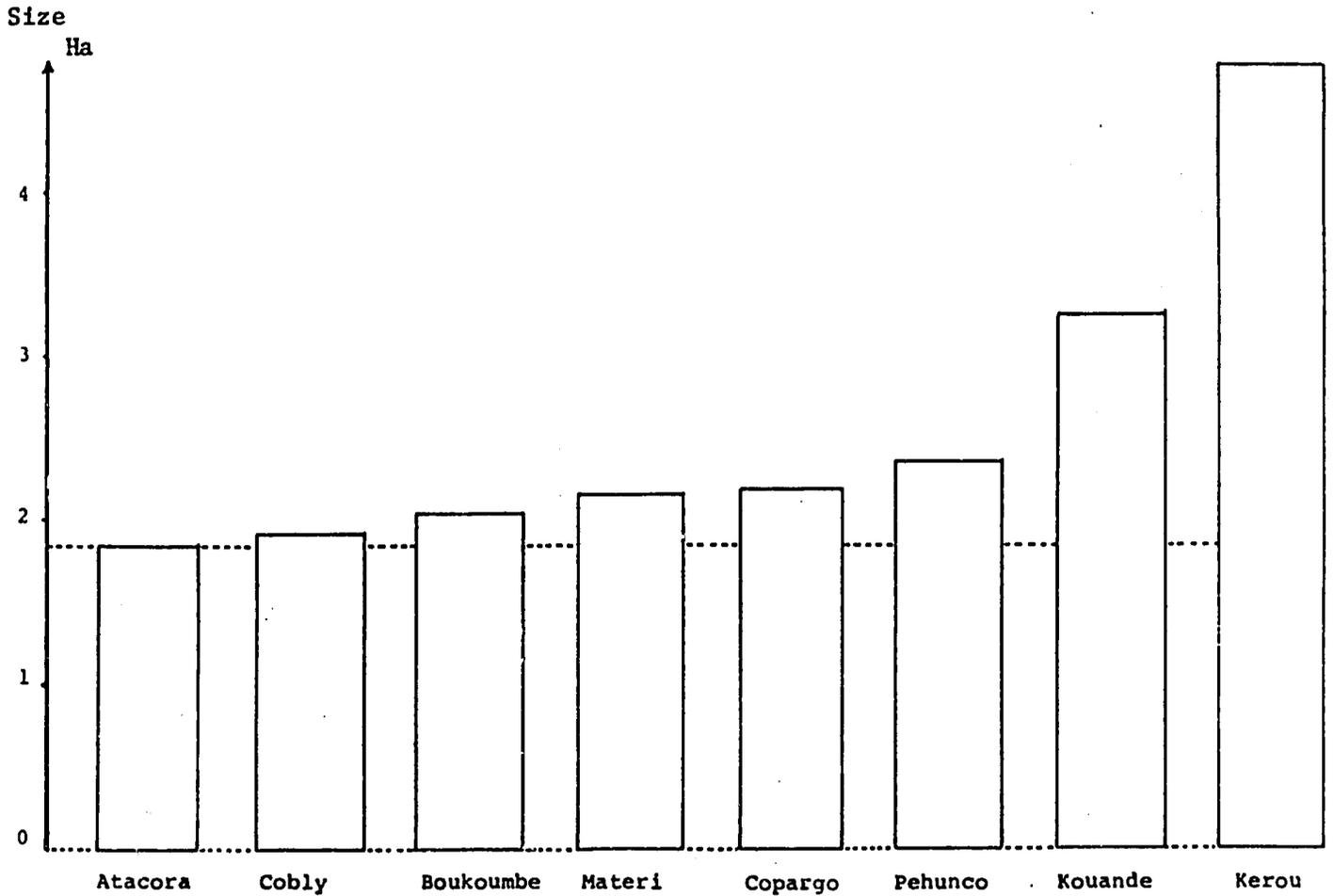
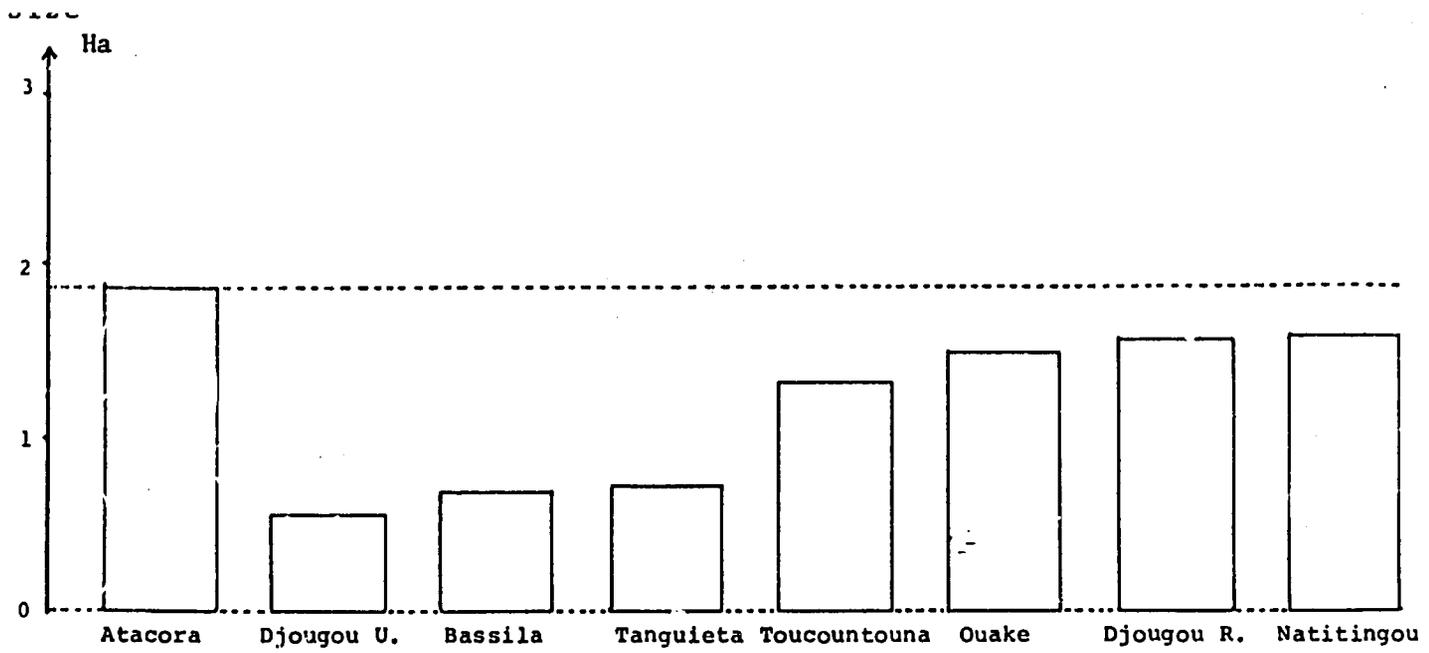
1. Distribution of Farms According to Their Dimension

Table 15 shows that 40.8% of the farms have a size smaller than or equal to 1 ha; therefore, close to 60% of the farms have a size in excess of 1 ha. The average size throughout the province is 1.70 ha.

DISTRIBUTION OF FARM DIMENSIONS, BY DISTRICT (Ha)

DISTRICT	MEAN	MEDIAN	RANGE
BASSILA	0.62	0.48	0.03 - 2.37
BOUKOUMBE	1.83	1.24	0.02 - 9.24
COBLY	1.74	1.54	0.08 - 5.98
COPARGO	2.00	1.95	0.42 - 6.62
DJOUGOU URBAIN	0.52	0.31	0.07 - 2.33
DJOUGOU RURAL	1.39	1.27	0.13 - 5.31
KEROU	4.29	3.55	0.71 - 8.79
KOUANDE	2.95	1.34	0.14 - 50.77
MATERI	1.97	1.85	0.12 - 4.86
NATITINGOU	1.42	1.06	0.10 - 6.66
OUAKE	1.34	0.66	0.11 - 11.42
PEHUNCO	2.14	2.02	0.14 - 5.61
TANGUIETA	0.64	0.59	0.05 - 1.99
TOUCOUNTOUNA	1.14	1.07	0.28 - 3.22
ATACORA	1.70	1.23	0.02 - 50.77

AVERAGE SIZE OF FARMS BY DISTRICTS



The districts of BASSILA, DJOUGOU URBAIN and TANGUIETA show an average surface area of less than 1 ha; in these districts more than 80% of the farms are smaller than or equal to 1 ha in size. The district of KEROU shows the highest percentage of farms covering more than 1 ha with an average surface of 4.29 ha.

DISTRIBUTION OF FARM DIMENSIONS, BY NATIONALITY (Ha)

NATIONALITY	MEAN	MEDIAN	RANGE
FON	1.50	1.34	0.27 - 3.89
BARIBA	2.60	2.24	0.14 - 8.79
DENDI	1.00	0.55	0.20 - 6.00
DJOUYOU	1.44	1.21	0.03 - 11.42
PEULH	2.70	1.30	0.34 - 50.70
OTAMMARI	1.72	1.31	0.02 - 9.24
YORUBA	0.68	0.49	0.16 - 2.37
OTHERS	1.08	0.75	0.12 - 2.66

Looking at the nationality breakdown, the DENDI and YORUBA nationalities own the smallest farms; more than 75% of the farms are smaller than 1 ha. Among the DJOUGOU, the average area is smaller than the average area for the province. The BARIBA and the PEULH show the highest proportion of farms whose size is in excess of 1 ha (85 and 70% of the farms, respectively). Among the OTAMMARI, who constitute the dominant nationality in the province, close to 60% of the farms cover more than 1 ha, with an average surface area identical to the average surface area for the province. Because of the very small number of field data, we cannot arrive at any conclusions regarding the FON nationality and the nationalities covered by the term "MISCELLANEOUS".

2. Distribution of Farm Dimension According to Farm Head's Age (Table 16)

Apart from the age group below 20 years (0.3%) represented only in farm types of less than 0.50 ha and including the category between 0.5 and 1 ha, we observe a disproportionate distribution of all of the farm categories among the other age groups.

The 30 - 39 age group is broken down into 46.7% for farms between 3.5 and 4 ha and 33% of farms between 4 and 5 ha. We also find the largest proportions of farms covering between 2.5 and 3 ha (43.2%) and between 3 and 3.5 ha (37.5%) in the 40 - 49 year age group. Looking at the age groups over 49, all of the size categories (apart from some isolated cases) appear to be distributed among these age groups in roughly homogeneous proportions.

In summary, there does not seem to be a significant relationship between the farm head's age and the farm's size. We note that the higher age groups show the largest proportions of large size farms.

3. Farm Size Distribution According to Household Size (Table 18)

Households comprising between six and ten residents are the majority in the province. They account for 42.9% of the farms and they show the highest proportions of farms between 1.5 and 5 ha.

We note the largest percentages of farms with a size of less than 0.05 - 1.5 ha in the household category with between one and five persons (35.2% of the farms). Households with more than ten persons share the highest proportions of farms of 5 ha and more.

We thus find that the proportion of large-size farms grows with the size of the households. With a few exceptions, these findings are also encountered on the district level and the nationality level. There is no significant difference between the districts and the nationalities.

Households of between one and five persons are in the majority in the districts of DJOUGOU URBAIN and NATITINGOU. In the district of KEROU, households with between 11 and 15 persons predominate. In the OTAMMARI group, households with between one and five persons are the majority.

4. Distribution of Farm Size According to Number of Persons Active in Agriculture (Table 19)

Farms with between three and four active individuals predominate (39.5%). They are represented in all size categories and show the highest proportions of farms with sizes between 1 and 4 ha. The highest percentages of farms covering 4 ha and more are distributed among farms with more than four active individuals.

Here again, the influence of household size and the number of active individuals reveals that the largest farms are to be found among farms with the largest number of persons active in agriculture.

There is no significant difference on the district and nationality levels. We note that farms with between one and two active individuals predominate in the districts of BASSILA and NATITINGOU. Farms with between seven and eight persons are in the majority in the district of KEROU.

5. Distribution of Farm Size According to Manner of Acquisition (Table 21)

The various origins of farmland observed in the province are as follows: inheritance, custom-based allocation free of charge, loan, sharecropping, and renting. According to Table 21, these origins can be broken down in the following manner:

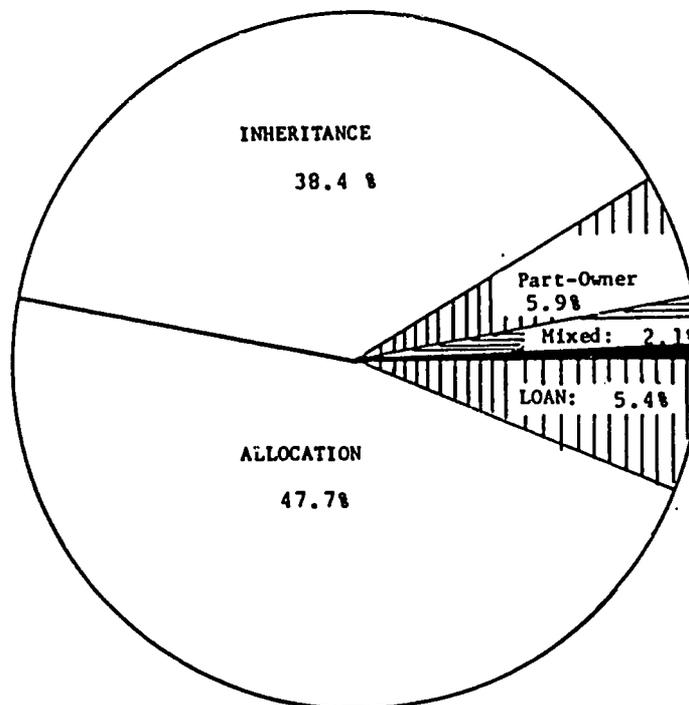
ALLOCATION	298 farms	or	47.7%
INHERITANCE	240 farms	or	38.4%
PART-OWNER	37 farms	or	5.9%
LOAN	34 farms	or	5.4%
MIXED	13 farms	or	2.1%
SHARECROPPING	2 farms	or	0.3%
RENTING	1 farm	or	0.2%

There is a very small proportion of temporary entitlements (13.9%). Among permanent rights (86.1%), custom-based allocation is the most frequent manner of acquisition (47.7%), followed by inheritance (38.4%).

Looking at the origin of farms according to their size category, we find that the various methods of acquisition now in existence are roughly represented in all of the size categories. Their percentage breakdown in each category does not seem to be related to the farm size.

With the exception of the districts of BOUKOUMBE, COBLY, MATERI and TOUCOUNTOUNA, where inheritance is the dominant form of acquisition, custom-based allocation is most frequent in the other districts. The graph below shows the relative importance of the mode of the farmland acquisition at a provincial level.

RELATIVE IMPORTANCE OF THE MODE
OF LAND ACQUISITION



6. Fields and Plots

a. Distribution of Fields and Plots by Size

The distribution of cultivated fields according to their size (Table 23) shows a concentration of fields in size categories of less than 0.20 ha and between 0.20 ha and 0.40 ha; we note a small proportion of fields with a size of 1 ha and more (15.3%).

DISTRIBUTION OF FIELDS ACCORDING TO SIZE
BY DISTRICT

DISTRICTS	Ha	0.2	0.4	0.6	0.8	1.0	1.5	2.0	3.0	4.0	5.0 +	TOTAL
	0.2	0.4	0.6	0.8	1.0	1.5	2.0	3.0	4.0	5.0		
BASSILA	33	15	22	3	2	3	0	0	0	0	0	78
	42.3	19.2	28.2	3.8	2.6	3.8	0.0	0.0	0.0	0.0	0.0	100%
BOUKOUMBE	100	45	48	23	20	29	16	6	3	2	1	293
	34.1	15.4	16.4	7.8	6.8	9.9	5.5	2.0	1.0	0.7	0.3	100%
COBLY	37	14	11	8	10	9	4	4	1	1	0	99
	37.4	14.1	11.1	8.1	10.1	9.1	4.0	4.0	1.0	1.0	0.0	100%
COPARGO	56	55	21	15	12	14	8	6	1	0	0	188
	29.8	29.3	11.2	8.0	6.4	7.4	4.3	3.2	0.5	0.0	0.0	100%

DJOUGOU URBAIN	32	9	4	2	1	0	0	0	0	0	2	50
	64.0	18.0	8.0	4.0	2.0	0.0	0.0	0.0	0.0	0.0	4.0	100%
DJOUGOU RURAL	29	33	25	18	15	15	3	2	0	0	1	141
	20.6	23.4	17.7	12.8	10.6	10.6	2.1	1.4	0.0	0.0	0.7	100%
KEROU	17	17	8	15	6	15	7	10	3	0	1	99
	17.2	17.2	8.1	15.2	6.1	15.2	7.1	10.1	3.0	0.0	1.0	100%
KOUANDE	8	8	3	6	2	11	7	7	0	0	0	52
	15.4	15.4	5.8	11.5	3.8	21.2	13.5	13.5	0.0	0.0	0.0	100%
MATERI	185	105	39	28	13	18	6	3	0	0	0	397
	46.6	26.4	9.8	7.1	3.3	4.5	1.5	0.8	0.0	0.0	0.0	100%
NATITINGOU	28	30	19	7	10	16	7	3	0	1	0	121
	23.1	24.8	15.7	5.8	8.3	13.2	5.8	2.5	0.0	0.8	0.0	100%
OUAKE	61	52	15	4	4	6	6	1	0	0	0	149
	40.9	34.9	10.1	2.7	2.7	4.0	4.0	0.7	0.0	0.0	0.0	100%
PEHUNCO	17	11	20	15	17	11	4	1	2	1	1	100
	17.0	11.0	20.0	15.0	17.0	11.0	4.0	1.0	2.0	1.0	1.0	100%
TANGUIETA	29	10	7	4	2	1	0	0	0	0	0	53
	54.7	18.9	13.2	7.5	3.8	1.9	0.0	0.0	0.0	0.0	0.0	100%

	9	17	18	6	10	6	2	1	0	0	1	70
TOUCOUN- TOUNA	12.9	24.3	25.7	8.6	14.3	8.6	2.9	1.4	0.0	0.0	1.4	100%

	641	421	260	154	124	154	70	44	10	7	7	1890
ATACORA	33.9	22.3	13.8	8.1	6.6	8.1	3.7	2.3	0.5	0.3	0.4	100%

**DISTRIBUTION OF FIELDS ACCORDING TO SIZE
BY NATIONALITY**

NATIONALITIES	Ha	0.2	0.4	0.6	0.8	1.0	1.5	2.0	3.0	4.0	5.0	TOTAL
	0.2	0.4	0.6	0.8	1.0	1.5	2.0	3.0	4.0	5.0	+	
FON	9	3	4	1	2	0	0	1	0	0	0	20
	45.0	15.0	20.0	5.0	10.0	0.0	0.0	5.0	0.0	0.0	0.0	100%
BARIBA	30	27	26	28	20	23	7	8	3	1	1	174
	17.2	15.5	14.9	16.1	11.5	13.2	4.0	4.6	1.7	0.6	0.6	100%
DENDI	33	12	3	4	1	2	2	2	0	0	2	61
	54.1	19.7	4.9	6.6	1.6	3.3	3.3	3.3	0.0	0.0	3.3	100%
DJOUGOU	137	129	61	35	29	31	17	7	1	0	0	447
	30.6	28.9	13.6	7.8	6.5	6.9	3.8	1.6	0.2	0.0	0.0	100%
PEULH	17	14	6	4	6	12	8	3	0	0	1	71
	23.9	19.7	8.5	5.6	8.5	16.9	11.3	4.2	0.0	0.0	1.4	100%

OTAMMARI	381	221	140	77	61	81	36	21	6	4	3	1031
	37.0	21.4	13.6	7.5	5.9	7.9	3.5	2.0	0.6	0.4	0.3	100%
YORUBA	24	12	16	2	0	3	0	0	0	0	0	57
	42.1	21.1	28.1	3.5	0.0	5.3	0.0	0.0	0.0	0.0	0.0	100%
MISC.	10	3	4	3	5	2	0	2	0	0	0	29
	34.5	10.3	13.8	10.3	17.2	6.9	0.0	6.9	0.0	0.0	0.0	100%
OVERALL	641	421	260	154	124	154	70	44	10	5	7	1890
	33.9	22.3	13.8	8.1	6.6	8.1	3.7	2.3	0.5	0.3	0.4	100%

**DISTRIBUTION OF PLOTS ACCORDING TO SIZE
BY DISTRICT**

DISTRICTS	Ha	0.2	0.4	0.6	0.8	1.0	1.5	2.0	3.0	4.0	5.0 +	TOTAL
	0.2	0.4	0.6	0.8	1.0	1.5	2.0	3.0	4.0	5.0		
BASSILA	47	17	23	3	2	1	0	0	0	0	0	93
	50.5	18.3	24.7	3.2	2.2	1.1	0.0	0.0	0.0	0.0	0.0	100%
BOUKOUMBE	299	95	56	37	30	27	7	3	0	0	0	554
	54.0	17.1	10.1	6.7	5.4	4.9	1.3	0.5	0.0	0.0	0.0	100%
COBLY	39	16	11	10	8	9	4	4	1	1	0	103
	37.9	15.5	10.7	9.7	7.8	8.7	3.9	3.9	1.0	1.0	0.0	100%

COPARGO	65	69	32	25	18	12	7	0	1	0	0	288
	28.5	30.3	14.0	11.0	7.9	5.3	3.1	0.0	0.0	0.0	0.0	100%
DJOUGOU URBAIN	34	10	3	2	1	0	0	0	0	0	2	52
	65.4	19.2	5.8	3.8	1.9	0.0	0.0	0.0	0.0	0.0	3.8	100%
DJOUGOU RURAL	54	50	30	21	13	20	0	0	0	0	0	188
	28.7	26.6	16.0	11.2	6.9	10.6	0.0	0.0	0.0	0.0	0.0	100%
KEROU	44	32	35	24	19	20	2	2	0	0	0	178
	24.7	18.0	19.7	13.5	10.7	11.2	1.1	1.1	0.0	0.0	0.0	100%
KOUANDE	58	55	28	8	3	1	3	1	0	0	0	157
	36.9	35.0	17.8	5.1	1.9	0.6	1.9	0.6	0.0	0.0	0.0	100%
MATERI	243	127	42	21	13	15	6	1	0	0	0	468
	51.9	27.1	9.0	4.5	2.8	3.2	1.3	0.2	0.0	0.0	0.0	100%
NATITINGOU	166	85	18	9	6	8	2	1	0	0	0	295
	56.3	28.8	6.1	3.1	2.0	2.7	0.7	0.3	0.0	0.0	0.0	100%
OUAKE	101	71	18	9	2	5	0	0	0	0	0	206
	49.0	34.5	8.7	1.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	100%
PEHUNCO	52	39	41	24	16	7	0	0	0	0	0	180
	28.9	21.7	22.8	13.3	8.9	3.9	0.0	0.0	0.0	0.0	0.6	100%

TANGUIETA	58	8	6	5	1	0	0	0	0	0	0	78
	74.4	10.3	7.7	6.4	1.3	0.0	0.0	0.0	0.0	0.0	0.0	100%
TOUCOUN- TOUNA	42	50	26	5	3	3	0	1	0	0	1	131
	32.1	38.2	19.8	3.8	2.3	2.3	0.0	0.0	0.0	0.0	0.8	100%
ATACORA	1302	724	369	203	135	128	31	13	1	1	4	2911
	44.7	24.9	12.7	7.0	4.6	4.4	1.1	0.4	0.0	0.0	0.1	100%

The plots are much more concentrated in the size category of less than 0.20 ha (44.7%) (Table 24).

DISTRIBUTION OF PLOTS ACCORDING TO SIZE BY NATIONALITY

NATIONALITIES	Ha	0.2	0.4	0.6	0.8	1.0	1.5	2.0	3.0	4.0	5.0 +	TOTAL
	0.2	0.4	0.6	0.8	1.0	1.5	2.0	3.0	4.0	5.0		
FON	10	3	4	1	2	2	0	0	0	0	0	22
	45.5	13.6	18.2	4.5	9.1	0.0	0.0	0.0	0.0	0.0	0.0	100%
BARIBA	89	78	56	40	28	16	1	2	0	0	1	311
	28.6	25.1	18.0	12.9	9.0	5.1	0.3	0.6	0.0	0.0	0.3	100%
DENDI	47	17	5	3	1	1	2	1	0	0	2	79
	59.5	21.5	6.3	3.8	1.3	1.3	2.5	1.3	0.0	0.0	2.5	100%

DJOUGOU	209	178	78	52	28	31	5	0	0	0	0	581
	36.0	30.6	13.4	9.0	4.8	5.3	0.9	0.0	0.0	0.0	0.0	100%
PEULH	57	46	30	7	6	7	3	0	0	0	0	156
	36.5	29.5	19.2	4.5	3.8	4.5	1.9	0.0	0.0	0.0	0.0	100%
OTAMMARI	843	385	174	95	65	68	20	8	1	1	1	1661
	50.8	23.2	10.5	5.7	3.9	4.1	1.2	0.5	0.1	0.1	0.1	100%
YORUBA	34	12	19	2	0	1	0	0	0	0	0	68
	50.0	17.6	27.9	2.9	0.0	1.5	0.0	0.0	0.0	0.0	0.0	100%
MISC.	13	5	3	3	5	2	0	2	0	0	0	33
	34.5	10.3	13.8	10.3	17.2	6.9	0.0	6.9	0.0	0.0	0.0	100%
OVERALL	1302	724	369	203	135	128	31	13	1	1	4	2911
	44.7	24.9	12.7	7.0	4.6	4.4	1.1	0.4	0.0	0.0	0.1	100%

According to Table 25, we have an average of 3 fields and 4.6 plots per farm or an average of 1.5 plots per field. The breakdown according to the number of fields per farm (Table 25) shows that the average farms of MATERI and KEROU are most heavily divided into plots while those of KOUANDE and BASSILA are less broken up. This same nationality study reveals that the farms of BARIBA and OTAMMARI groups appear to be most heavily broken up. On the other hand, they are less broken up among the PEULH group.

DISTRIBUTION OF AVERAGE NUMBER OF FIELDS AND PLOTS
BY FARM, BY DISTRICT

DISTRICTS	AVERAGE NUMBER OF FIELDS	AVERAGE NUMBER OF PLOTS	AVERAGE NUMBER OF PLOTS PER FARM
BASSILA	1.8	2.1	1.2
BOUKOUMBE	3.0	5.8	1.9
COBLY	2.7	2.8	1.0
COPARGO	3.9	4.9	1.2
DJOUGOU URBAIN	2.5	2.6	1.0
DJOUGOU RURAL	2.4	3.2	1.3
KEROU	4.3	7.7	1.8
KOUANDE	1.6	4.6	3.0
MATERI	5.6	6.6	1.2
NATITINGOU	2.0	5.2	2.6
OUAKE	3.2	5.5	1.4
PEHUNCO	2.8	5.0	1.8
TANGUIETA	2.3	3.4	1.5
TOUCOUNTOUNA	1.9	3.6	1.9
PROVINCE ATACORA	3.0	4.6	1.5

DISTRIBUTION OF AVERAGE NUMBER OF FIELDS AND PLOTS
PER FARM ACCORDING TO NATIONALITY

NATIONALITIES	AVERAGE NUMBER OF FIELDS	AVERAGE NUMBER OF PLOTS	AVERAGE NUMBER OF PLOTS PER FARM
LARIBA	3.3	6.0	1.8
DENDI	2.7	3.4	1.3
DJOUGOU	3.0	4.0	1.3
PEULH	1.8	3.9	2.2
OTAMMARI	3.3	3.3	1.6
YORUBA	2.0	2.3	1.2
PROVINCE ATACORA	3.0	4.6	1.5

According to Table 27, we find a concentration of high proportions of fields and plots among farms whose size is greater than 1 ha. We can then conclude that the large-sizes are most heavily broken up. There is a rather significant relationship between farm size and number of fields and the number of plots.

b. Distribution of Plots According to Crop Type (single crops or mixed crops)

The distribution of plots according to crop type (Table 26) shows a definitely high proportion of plots with single crops.

The categorization of plots according to their size shows that a little more than half of the plots with single crops are in the size category of less than 0.20 ha, while 33% of plots with mixed crops are in this category. It follows that 67% of mixed crop plots are distributed in size categories in excess of 0.20 ha. On the basis of this finding, we can conclude that the average surface of a mixed crop plot is probably greater than the average surface of a single crop plot. Table 28 confirms this finding since the calculation of average surfaces of single crop plots and mixed crop plots respectively gives us 0.325 ha and 0.4750 ha. It follows from this table also that 60% of cultivated surface areas contain single crops and that about 40% contain mixed crops.

7. Distribution of Distances between Home and Fields

The location of the fields with relation to the farmer's house is important from the viewpoint of gaining time. Several hours of walking or transportation effort during the manpower shortage can be saved. Table 30 shows the distribution of distances and walking times from the home to field.

We find that close to 63% of the fields on the average are less than 1 km from the residence of the farm heads. The average distance is 1.200 km. Only 5% of the fields are more than 5 km away, more than an hour's walk from the farmer's house. The average and modal distances are distributed as follows, by district:

DISTRICT	DISTANCE BETWEEN HOME AND FIELD (KM)	
	MEAN	MODE
BASSILA	3.3	6.0
BOUKOUMBE	1.3	0.0
COBLY	0.6	0.0
COPARGO	0.7	0.0
DJOUGOU URBAIN	2.6	0.3
DJOUGOU RURAL	0.9	0.5
KEROU	0.3	0.7
KOUANDE	0.7	0.3
MATERI	1.6	1.0
NATITINGOU	0.8	0.5
OUAKE	1.4	0.0
PEHUNCO	0.4	0.1
TANGUIETA	0.5	0.5
TOUCOUNTOUNA	1.3	0.0
PROVINCE ATACORA	1.2	0.0

D. Farm Work and Labor Force Utilization

In the traditional family farms, work is the most essential factor because of its primacy over the other means of production. Moreover, it represents the limiting factor in traditional agriculture since working the soil is based exclusively on human energy. Consequently, the study of work operations is of capital importance to the economy of agricultural production. The broad range of operations to be performed within the context of our survey did not enable us to grasp, in its lesser details, all of the aspects of the problem of utilizing the labor force available on the traditional farms. Hence, it seems highly desirable to contemplate a

complementary survey for an in-depth study of problems relating to the allocation of available manpower to the various crop cultivation operations.

1. Labor Sources

The manpower necessary to accomplish the various agricultural tasks can come from various origins according to the forms of production organization. We can thus identify, in line with the particular case involved, team labor, mutual aid labor, paid manpower, and family manpower.

a. Team Labor

Two forms of cooperative structures were established as part of the implementation of the agricultural collectivization policy in the People's Republic of Benin: the Revolutionary Groupments with Cooperative Inclination (G.R.V.C.) (Revolutionary Cooperative Group), and the Socialist type Experimental Cooperatives (C.A.E.T.S.) (Socialist Experimental Agricultural Co-op).

- The G.R.V.C. is not strictly a production cooperative but rather a service cooperative whose main purpose is to guarantee:
 - Primary collection of products from its members
 - Supplying members with materials according to production efforts
 - Purchase of collective equipment

- Establishments of crop blocks for the regrouping, in one and the same site, of the individual plots of each of the members with a view to making the work of the extension agents more effective.

According to Table 44, only 2% of the farm households surveyed joined a G.R.V.C.. This small proportion of G.R.V.C. membership must be related with the very small number of G.R.V.C. established in the province.

According to the annual harvest report (1981 - 1982) of CARDER-ATACORA, there are currently 100 G.R.V.C. with a total number of 1,755 members.

As currently conceived, the G.R.V.C. constitute a transition stage between the individual farm and the collective farm (the C.A.E.T.S.).

- The C.A.E.T.S. constitute real production cooperatives by virtue of the collective character of the appropriation of the means of production and the production processes.

Initially all means of production are snared in common but the distribution of the fruits of labor is based on each cooperative member's contribution in terms of material resources and labor supply.

In a second stage, there is total collectivization of all means of production (material resources and labor) but here remuneration is made only as a function of the work done according to the principle "to each according to his work".

As indicated in Table 40, out of the 644 farm households surveyed, there is only one household where at least one member belongs to a C.A.E.T.S.. This situation is also due to the slow development of the establishment of C.A.E.T.S. in the province. According to the CARDER farming year report, seven C.A.E.T.S. with a total of 164 members are currently in existence.

b. Mutual Aid Labor

Mutual aid is one of the manpower categories involved in farm work done by individual family farms. The farmers establish work groups in order to assist each other, by turns, in the accomplishment of cultivation operations and sometimes in construction work. This type of work does not require any expenditures in the form of cash; supplying meals remains the only expenditure for any member who receives the work group. About 43% of the farm households surveyed belong to a mutual aid group. With the exception of the urban district of DJOUGOU, where none of the households surveyed resorted to mutual aid, we find that the practice of mutual aid is very widespread in the province's other districts (Table 38).

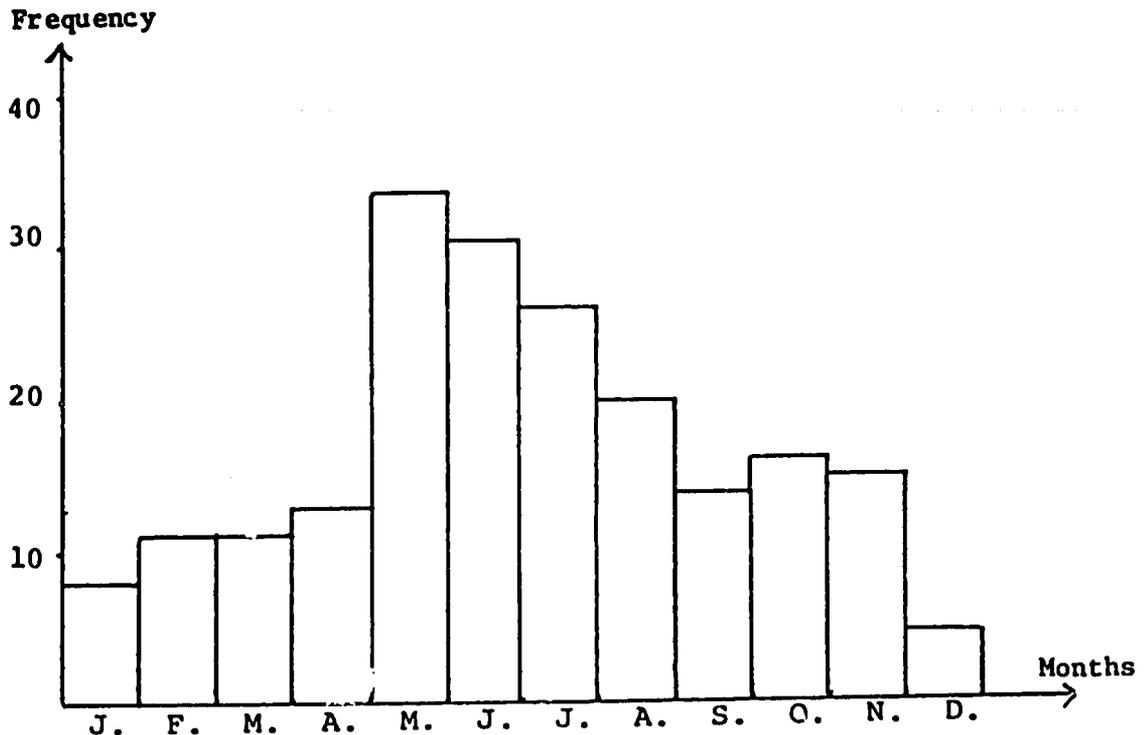
c. Salaried Manpower

Salaried manpower is very little used in the province; only 15% (Table 35) of the households surveyed declared that they had used paid labor. This small proportion of hired manpower employment does not necessarily mean that there is no specific

demand; but this is mainly because this manpower is not available and is becoming increasingly expensive when compared to the profitability of the crops. The low productivity of farm labor, miscellaneous social and family pressures, and the prospects of finding sufficient pay elsewhere, lead to major migration movements among the active population, such as the flight from the rural areas to the cities and emigration to neighboring countries.

According to Table 37, dealing with the distribution of manpower requirement, by months, there seems to be manpower shortage between May and August. This is the time of full farm employment during which certain work cannot be postponed but must be done. These operations include land reclamation, weeding, fertilizer, spreading, plant protection, etc. The peak period comes in the month of May and corresponds to the planting time as shown in the following graph.

**DISTRIBUTION OF MONTHS WITH LABOR PAUCITY
ACCORDING TO FARM HEADS HIRING LABOR**



d. Family Manpower

In traditional agriculture family manpower constitutes the main source of labor. As we indicated in the preceding chapter, the labor force of family origin consists of 4.3 active individuals (2.3 women and 2 men), on the average, per farm. To this we must add the activities of children of working age (7 - 14 years) who can help the household head on the farm at one time or another throughout the year. We have an average of 1.8 children in this age group, per farm.

It must, however, be emphasized that the consumption unit, represented by the family group does not always correspond to the production unit. In other words, it might happen that certain members of the household do not participate or participate only temporarily in agricultural activities.

2. Labor Force Utilization and Work Time Determination

There are three major manpower categories involved in agricultural work done on individual family farms:

- family manpower
- mutual aid
- salaried manpower.

The work time, devoted to each cultivation operation by manpower category, was recorded on a day-by-day basis with the help of interviews conducted in farm households. To reduce memory lapses, an interviewer visited each sample farm once or twice a week throughout the farming year.

Family manpower was subdivided into husband, wife, and child. Paid labor was measured in terms of the work day and the total labor consumption was determined after conversion of working days put in by the women and the children into man-days. To do that we arbitrarily adopted the following coefficients (pending the availability of much more detailed studies on the determination of man-equivalent coefficients).

<u>Type of worker</u>	<u>Age</u>	<u>Coefficient</u>
Men	15 yrs and over	1.00
Women	15 yrs and over	0.75
Children	7 - 14 yrs	0.50
Children	0 - 6 yrs	0.00

However, we attributed one man-equivalent to the woman for all operations having to do with cultivation, maintenance, and harvesting.

a. Labor Force Utilization

Cultivation operations require major manpower contributions; the existence of certain operations that cannot be postponed and the constraint of time lead to labor bottlenecks.

During the current stage of peasant agriculture most of the work is still manual. In most cases very few farmers are using teams of animals for crop cultivation. On the farms observed we recorded an average, per farm, of 4.1 work days with animal power and 2.1 work days with tractors throughout the farming year. This represents, respectively, 1% and 0.5% of the annual manpower needs of an average farm (Table 50). The labor supply, mostly of family origin keeps shrinking as a result of intensive emigration among the active population.

A study of Table 50 shows that more than 89% of the manpower needs are supplied by the family group; 10% will come from mutual aid and only 0.5% consists of salaried manpower.

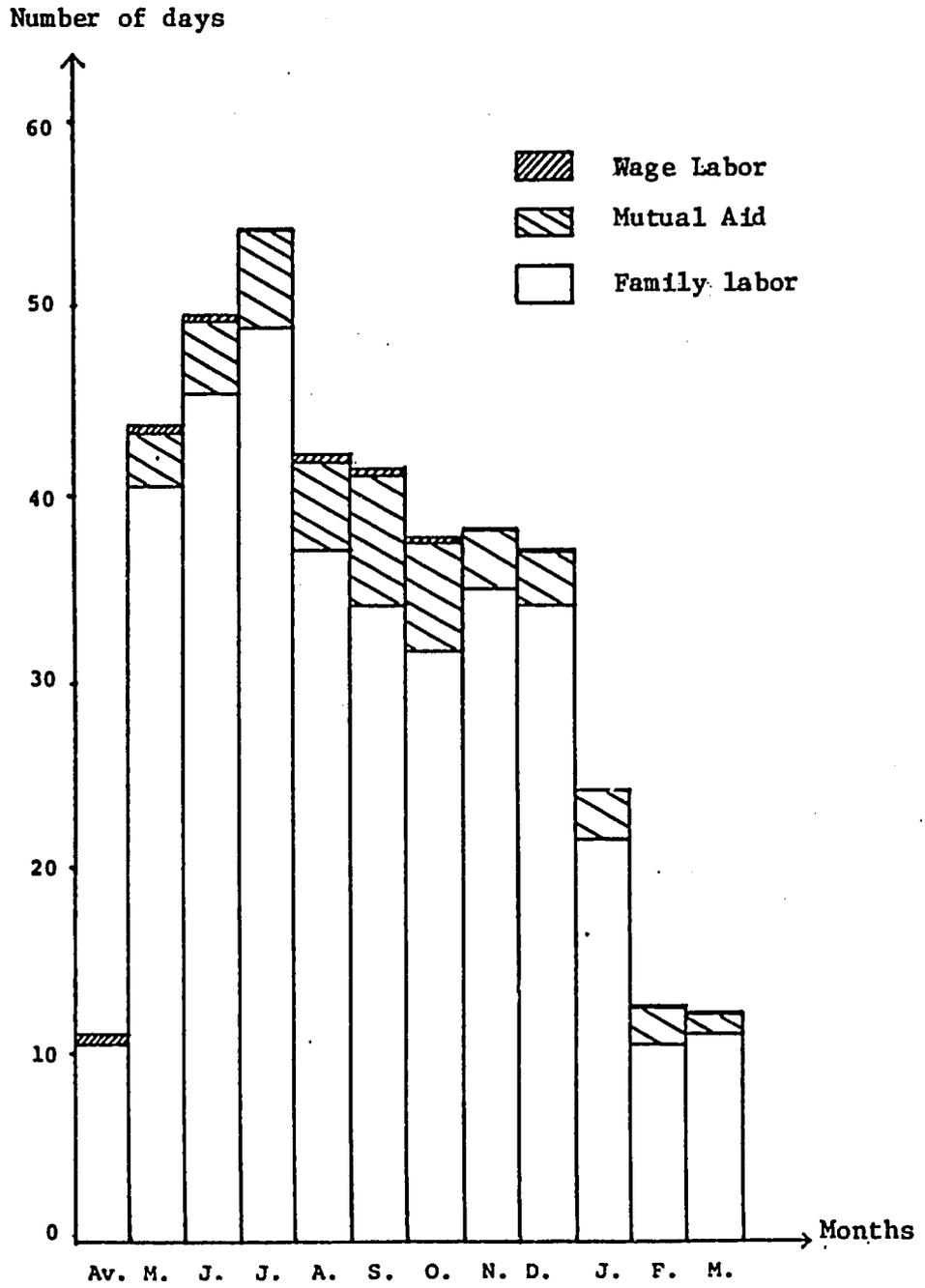
**MONTHLY DISTRIBUTION OF NUMBER OF WORK DAYS
BY TYPE OF MANPOWER
(MAN-DAYS PER HOUSEHOLD)**

MONTH	TRACTOR	TEAM	FAMILY	MUTUAL AID	SALARIED	TOTAL
JANUARY	0.0	0.5	21.7	2.4	0.0	24.6
	0.0	2.0	88.2	9.8	0.0	100.0%
FEBRUARY	0.0	0.0	10.6	1.9	0.1	12.6
	0.0	0.0	84.1	15.1	0.8	100.0%
MARCH	0.0	0.0	11.3	0.7	0.1	12.1
	0.0	0.0	93.4	5.8	0.8	100.0%
APRIL	0.0	0.6	10.6	0.4	0.0	11.6
	0.0	5.2	91.4	3.4	0.0	100.0%
MAY	0.0	0.2	40.7	2.5	0.3	43.7
	0.0	0.5	93.1	5.7	0.7	100.0%
JUNE	0.0	0.2	45.4	4.0	0.3	49.9
	0.0	0.4	91.0	8.0	0.6	100.0%
JULY	0.2	1.4	49.1	5.1	0.1	55.9
	0.4	2.5	87.8	9.1	0.2	100.0%

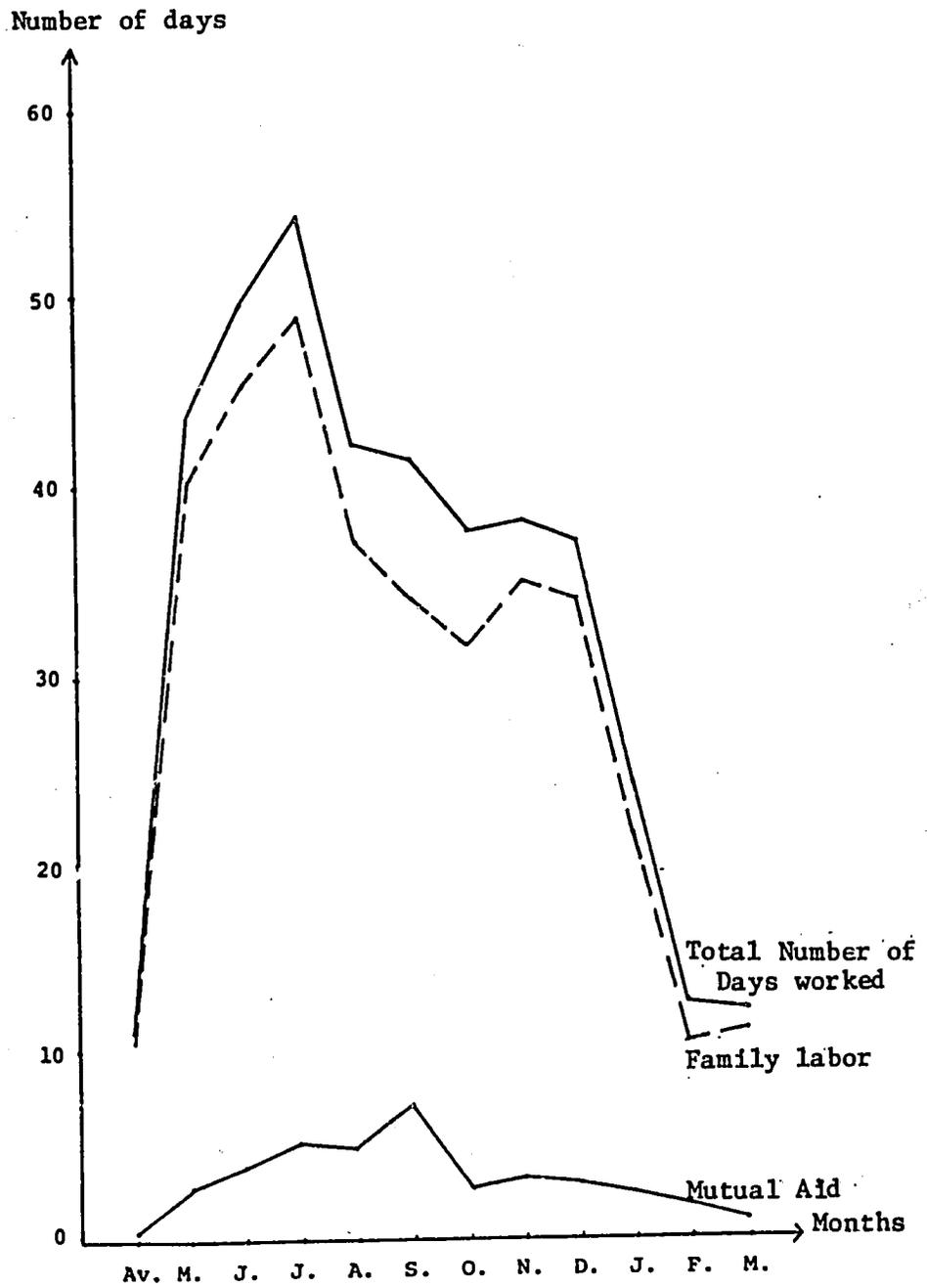
AUGUST	0.1	0.2	37	4.7	0.5	42.5
	0.2	0.5	87.0	11.1	1.2	100.0%
SEPTEMBER	1.5	0.0	33.9	7.4	0.3	43.1
	3.5	0.0	78.6	17.2	0.7	100.0%
OCTOBER	0.2	0.9	31.6	5.6	0.4	38.7
	0.5	2.3	81.6	14.5	1.0	100.0%
NOVEMBER	0.1	0.1	34.9	3.3	0.1	38.5
	0.2	0.2	90.7	8.7	0.2	100.0%
DECEMBER	0.0	0.0	33.9	3.0	0.1	37
	0.0	0.0	91.6	8.1	0.3	100.0%
ANNUAL	2.1	4.1	360.7	41.0	2.3	410.2
	0.5	1.0	88.0	10.0	0.5	100.0%

The family manpower reveals the following features regarding participation by household members in agricultural activities.

**MONTHLY DISTRIBUTION OF NUMBER OF WORK DAYS
BY TYPE OF MANPOWER**



GRAPHIC ILLUSTRATION OF NUMBER OF MAN-DAYS
BY TYPE OF MANPOWER



CATEGORIES	NUMBER OF MAN-DAYS	PERCENTAGE
MEN	190.0	52.9
CHILDREN	93.0	25.8
WOMEN	76.7	21.3
TOTAL	360.6	100.0

We find that women supply less than 25% of the family manpower; their participation rate is also less than that of the children (7 - 14 years). This percentage however appears low because certain para-agricultural and domestic activities are not taken into account here although they contribute to the survival of the farm and are women's work (processing of products, supply of water, wood, food, child care, etc.).

We find this same trend on the level of the district, with the exception of the districts of MATERI, COBLY and NATITINGOU which show female work contributions higher than the provincial average. Moreover, in the district of MATERI, this contribution is greater than that of men.

Overall, an average farm household spends 410 working days per year on the farm, including 366 working days put in by family manpower. Considering that on average there are two working men per farm household, we can estimate that one working man devotes 95 days per year to agricultural activities. Although we must use this figure with caution, it is nevertheless

true that it does represent an indicator for the seasonal under-employment problem on family farms.

This under-employment is inevitable since there are few non-agricultural employment possibilities in the rural areas.

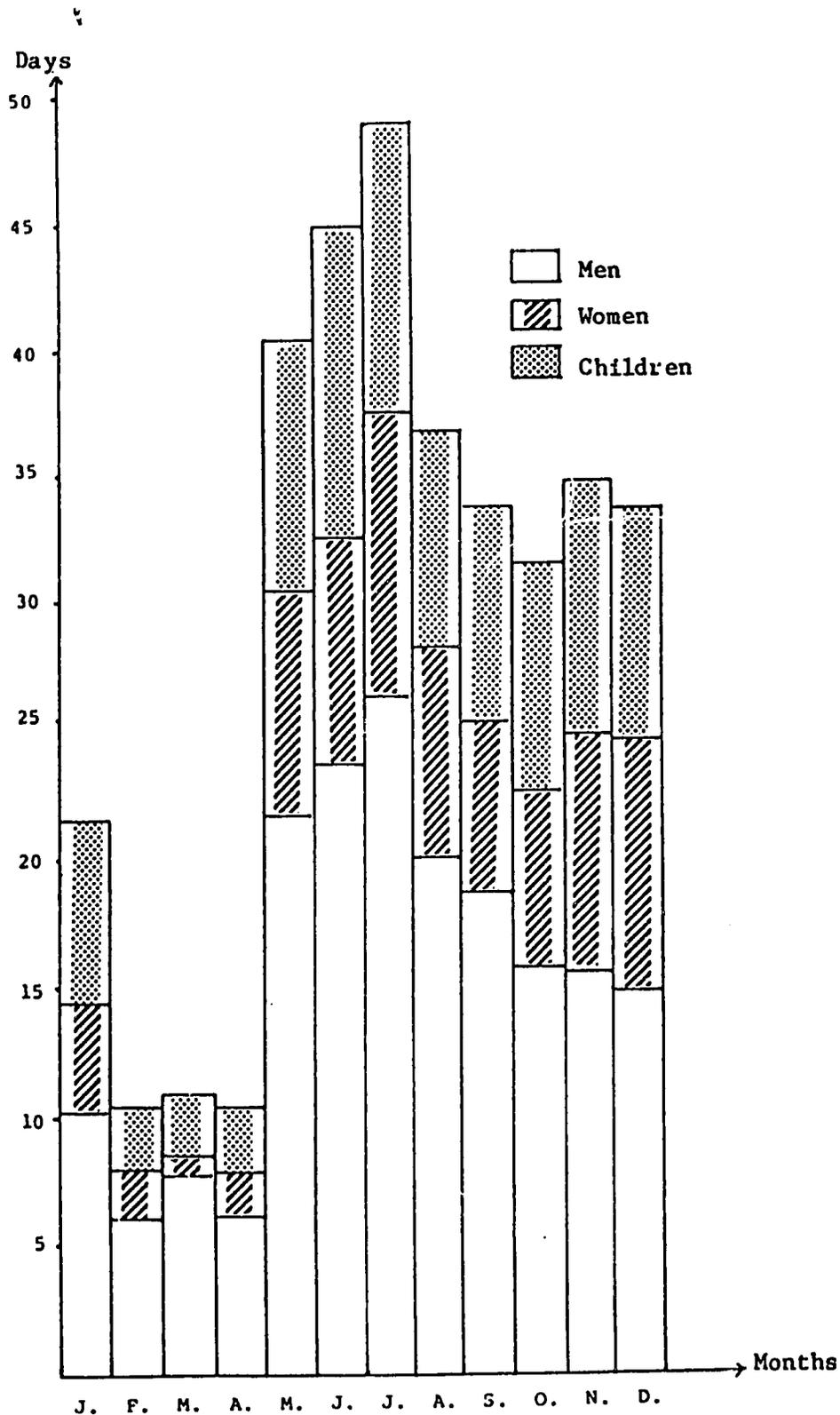
ANNUAL AVERAGES OF WORK DAYS
PUT IN BY FAMILY MANPOWER
BY CATEGORY AND BY DISTRICT

DISTRICTS	MEN	WOMEN	CHILDREN	TOTAL
BASSILA	100.1	18.6	75.1	193.8
	51.6	9.6	38.8	100.0%
BCUKOUMBE	115.5	79.2	86.4	281.1
	41.1	28.2	30.7	100.0%
COBLY	286.7	221.2	113.6	621.5
	46.1	35.6	12.3	100.0%
COPARGO	208.4	49.3	87.5	342.2
	60.9	14.4	25.7	100.0%
DJOUGOU URBAIN	110.5	32.7	99.0	242.2
	45.6	13.5	40.8	100.0%

DJOUGOU RURAL	224.0	54.3	82.0	• 360.3
	62.2	15.1	22.7	100.0%
KEROU	502.4	91.3	238.5	832.2
	60.4	11.0	28.6	100.0%
KOUANDE	181.8	24.3	142.9	349.0
	52.1	7.0	40.9	100.0%
MATERI	141.3	185.3	68.5	395.1
	35.8	46.9	17.3	100.0%
NATITINGOU	109.9	75.7	42.1	227.7
	48.3	33.2	18.5	100.0%
OUAKE	144.8	48.3	39.9	233.0
	62.1	20.7	17.2	100.0%
PEHUNCO	518.5	23.3	285.2	827.0
	62.7	2.8	34.5	100.0%
TANGUIETA	193.9	55.8	61.6	311.3
	62.3	17.9	19.8	100.0%

TOUCOUNTOUNA	132.1	65.4	36.4	233.9
	56.5	28.0	15.5	100.0%
<hr/>				
PROVINCE ATACORA	190.9	76.7	93.0	360.6
	52.9	21.3	25.8	100.0%
<hr/>				

MONTHLY DISTRIBUTION OF NUMBER OF WORK DAYS BY FAMILY MANPOWER, BY CATEGORY



b. Determination of Work Time

(1) Definition of Periods

Agricultural activities follow the rhythm of seasonal sequences. The crop season lasts about 4 - 6 months.

The graph, prepared on the basis of the distribution of agricultural households according to periods of agriculture work implementation (Table 52), enables us to define the periods within which we find the different cultivation operations. It is difficult to precisely indicate the dates for the start and end of each period. Data for a single year do not constitute a reliable basis. The definition of the dates that mark the beginning and end of each period requires a frequential analysis of rainfall over a long period of time. Nevertheless, we did define the periods on the basis of the statements made by the peasants and observations made in the field.

1st period: preparation of fields and seeding: April to June.

2nd period: maintenance of crops: June to August. Maintenance includes weeding, spreading fertilizer, treatments, earthing up and thinning.

3rd period: harvest: August to December.

4th period: dry season (December to early May). This is the slack season in farm activities. During that period of time however, the following post-harvest operations take place:

- storage
- threshing
- drainage
- winnowing
- repair and construction work
- work to clean fields to be cultivated and clearing work (toward the end of the dry season)
- miscellaneous non-agricultural activities, etc.

It should be noted that, regarding yam and manioc (cassava), field preparation and seeding operations come during the period between October and January; the harvesting starts roughly during the same period of time.

CROP CALENDAR

PRODUCTS	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY
A T A C O R A												
CORN		Land clearing	Plowing	Planting		Harvesting	Harvesting					
SORGHUM	Land clearing	Land clearing	Plowing	Planting					Harvesting	Harvesting		
MILLET		Land clearing	Plowing	Planting					Harvesting	Harvesting		
RICE	Land clearing	Land clearing	Plowing	Planting				Harvesting	Harvesting			
CASSAVA								Land clearing	Planting	Harvesting	Harvesting	Harvesting
YAM								Planting	Harvesting	Harvesting	Harvesting	Harvesting
COTTON		Land clearing	Plowing	Planting				Harvesting	Harvesting			
PEANUTS		Land clearing	Plowing						Harvesting	Harvesting		



The seasonal family farm manpower distribution shows critical periods during which we find manpower bottlenecks. In particular we note that the peak extends from May until July and coincides with the period of field preparation, cultivation and the start of weeding.

(2) Work Time per Cultivation Operation

A working day lasts between 5 and 6 hours for harvest work. This is far from the 8 hours observed in the public administration.

The working day varies according to the period of the season, and according to the age and sex (Tables 48 and 49). The recapitulations of average and modal durations of the working day per season, by sex and by age, can be presented as follows (in terms of hours and tenths of an hour).

PERIOD	MEN		WOMEN		CHILDREN	
	MEAN	MODE	MEAN	MODE	MEAN	MODE
PLANTING	5.5	6.0	5.0	6.0	3.9	4.0
HARVESTING	6.3	6.0	5.5	6.0	4.1	4.0
DRY SEASON	1.3	0.00	0.8	0.0	0.6	0.0

As we can see, the activities are reduced to a minimum on the farm during certain periods of the dry season.

Table 51 gives the distribution of work times per hectare, by crop and by operation, for the main crops observed. These average times are as follows, by crop and by operation: (in man-days).

CROPS	SOIL PREPARATION	PLANTING	WEEDING	HARVEST	DECORTICATION	TOTAL
CORN	13.0	15.7	13.5	16.3	-	58.5
SORGHUM	19.3	15.2	23.0	18.8	-	76.3
MILLET	19.7	15.0	20.7	18.3	-	73.7
RICE	22.2	22.6	27.5	23.7	12.5	108.5
FONIO	16.1	16.0	13.6	19.0	-	64.7
PEANUT	16.0	15.1	17.1	26.9	-	75.1
VOANDZOU	21.2	13.7	15.6	22.0	-	72.5
BEAN*	37.5	11.2	21.1	19.2	-	89.0
YAM	21.8	19.5	20.2	20.7	-	82.2
MANIOC	17.4	16.4	18.2	17.2	-	68.8
COTTON*	9.4	11.6	32.0	44.0	-	97

*Note: Data on these two crops is very small.

Collecting data on working times is delicate and requires much care. The figures presented above are not devoid of observational errors. Besides, the data collected during a particular year are specific only for that year because they are related to climatic conditions, to the soil structure, type of vegetation, and the physical condition of the workers.

This is why, in an effort to indicate certain guidance figures on manpower utilization on the

level of traditional farms, it seems important to conduct supplementary research on the following points:

- In-depth study of cultivation operations.
- Determination of days available and unavailable, month by month.
- Determination of optimum periods for each type of cultivation operation.
- Measurement of work time per cultivation operation and product, then by sex and by age, to indicate the man-equivalent coefficients.

E. Non-agricultural Activities

During the slack season in agricultural activities and during certain crop cultivation periods, agricultural households also engage in certain para-agricultural activities which contribute to an increase in their money income. These activities may involve small animal husbandry, crafts, commerce, the production of fire wood, hunting, gathering, etc.

The calculation shows that 53.2% of the households surveyed engaged in non-agricultural activities during the farming year. We record the following proportions, by nationality:

DENDI	88.0%
YORUBA	70.9%
PEULH	63.4%
DJOUYOU	63.5%

OTAMMARI	44.8%
BARIBA	33.3%

The DENDI and YORUBA present the highest proportion of households engaged in non-agricultural activities. They are known to be good at commerce. Relatively few BARIBA, only 33%, are engaged in activities other than agricultural activities.

Table 53 shows the distribution of agricultural households that engaged in non-agricultural activities according to the number of man-days devoted to these activities. We find that the average and modal durations are, respectively, 73.6 and 48 man-days per household. The distribution of average and modal times of non-agricultural activities broken down by nationality follows:

NATIONALITIES	MEAN	MODE
BARIBA	54.7	24
DENDI	115.8	91
PEULH	52.4	-
YORUBA	57.3	10
DJOUYOU	78.7	48
OTAMMARI	67.4	208

Tables 54 and 55 show the distribution of agricultural households according to the number of man-days devoted to non-agricultural activities and according to the size of the farm, and the size of the household. These tables show that there is a smaller relationship between the number of man-days

and the size of farm ($r = .09$), than between the number of man-days and the size of the household ($r = .11$). We see most households devoted to non-agricultural activities in farms of less than 0.5 ha, as shown in the following table.

SIZE OF THE FARM (hectares)		PROPORTION OF HOUSEHOLD (%)
less than	0.5	23.4
0.5	1.0	19.9
1.0	1.5	16.2
1.5	2.0	14.2
2.0	2.5	9.2
2.5	3.0	6.6
3.0	3.5	4.0
3.5	4.0	1.4
4.0	5.0	2.6
5.0	10.0	1.7
10	and over	0.6
TOTAL		100.0

This table shows clearly that when the size of the farm increases, members of the household devote less time outside.

SIZE OF HOUSEHOLD		PROPORTION OF HOUSEHOLD (%)
1	5	28.4
6	10	43.8
11	15	17.1
16	20	6.2
20	and over	4.5
TOTAL		100.0

We also observe the relation that exists between the size of the households and the proportion of the households who work outside, the larger the household the less they work outside.

Table 56 shows the distribution of agricultural households according to non-agricultural income. A study of this Table shows that the highest proportions of households engaged in non-agricultural activities can be found in the income brackets below 10,000 (24.5%) and 10,000 - 30,000 (25.5%). The average and modal incomes for all of the households are 56,536 F and 24,500 F per annum.

The average and median incomes generated by non-agricultural activities appears broken down by nationality (in terms of F. C.F.A. - Francs of the African Financial Community).

NATIONALITIES	MEAN	MEDIAN (F.C.F.A.)
BARIBA	60,616	31,900
PEULH	43,959	23,250
DENDI	133,454	935,000
DJOUYOU	61,839	35,700
OTAMMARI	38,836	12,405
YORUBA	50,069	14,300

For the DENDI, PEULH and YORUBA, these values have little significance as they are based on limited observations.

F. Farm Tools and Equipment - Loans

1. Farm Tools and Equipment

The material resources which the peasant devotes to this production are rather rudimentary equipment consisting of small agricultural implements (hoes, machetes, axes, sickles, etc.).

Animal traction is still little developed and the proportion of farmers engaged in animal-team crop cultivation is almost insignificant.

a. Small Material Implements

The Hoe

The hoe is used on all farms. There is an average of 4.4 hoes per farm (Table 57). The breakdown according to farm size shows that almost 60% of the hoes are to be found on farms in the size category of more than 1 ha (Table 58). The distribution according to the number of active individuals indicates that the highest proportion of hoes (37.5%) is found in farms with between 3 and 4 active individuals (Table 59).

The Machete

On the average there are 1.4 machete per farm (Table 57). The largest proportion of machetes is found in farms less than 2 ha in size (Table 58). We also find that farms with between three and four active individuals possess 40% of the machetes (Table 59).

The Sickle

The sickle is also used in the farms of ATACORA; there is an average of 1.5 sickles per farm.

The Ax

This is a tool which is important on the farms but which we did not record because it was not specified in our questionnaire. The survey results under Project UNDP/FAO/BEN/73/020 of 1977 counted 1.6 per farm.

b. Storage and Drying Facilities

The survey also looked into storage and drying equipment.

The granary is generally found on all farms; we counted 1.9 per farm.

The use of silo is not widespread; on all farms visited, we only counted 98 at the start of the survey. There are only a few peasants who have permanent drying areas.

c. Draft-team Crop Cultivation Equipment

The practice of draft-team crop cultivation has not yet been developed in the manner necessary in the province; for all the farms surveyed, we recorded only 25 plows, 72 draft oxen and five carts.

The inability to secure the loan or credit required for the procurement of equipment is undoubtedly a bottleneck in the development of draft-team crop cultivation on the individual farms.

2. Loan

Table 62 shows the percentage of farm households that applied for loans during the period covered by the survey; it thus appears that only 27 households, or 4.1% households surveyed, used loans for production purposes.

The very small number of field data undoubtedly does not enable us to come up with a relationship between the use of loans and:

- a) the farm's size (Table 63 B)
- b) the farm head's age (Table 63)
- c) the farm head's education level (Table 64).

Table 65 shows the distribution of households that did not use loans, broken down by category of reasons. Among the reasons given, the most important ones are as follows:

- no need for loan	40.7%
- does not know how to get it	25.5%
- much trouble	22.5%

It thus appears that 40.7% of the peasants who did not apply for a loan did not have any need for it; 25.5% did not know how to obtain loans; and 22.5% were discouraged by the conditions connected with the grant of a loan.

We encounter these same conditions on the level of the districts and the nationalities. However, we note that in certain districts and certain nationalities, the dominant reason differs from the reasons given for the province as a whole. Thus, "does not know how to get it" constitutes the main reason in the district of DJOUGOU (50%) as well as for the YORUBA (48.5%) and DENDI (45.8%) nationalities. "Much trouble" is the main reason cited in the districts of TANGUIETA (95.8%) and TOUCOUNTOUNA (53.3%).

These various findings partly derive from the situation prevailing on the level of institutional loan structures. At the start of each farming year, the CARDER grants the peasant a farm year loan in the form of production factors (seeds, fertilizers, draft-team crop cultivation equipment, etc.). However, the difficulties encountered

of cash repayment of these means of production apparently led the CARDER to restrict the granting of loans to individual farmers so as to give priority only to cooperative structures (farming year report, CARDER - ATACORA, 1981-1982).

Furthermore, the Regional Mutual Agricultural Loan Fund (C.R.C.A.M.) also grants only to cooperative structures.

It thus appears that the individual farmer's possibilities of getting a loan are poor if not entirely non-existent.

The restrictions connected with getting loans will impose severe limitations on technology transfer in a rural environment. The adoption of technical innovations (selected seeds, fertilizer, draft-team crop cultivation, etc.) constitutes financial commitments for the person who often does not want to take the risk of going into debt in this way. We think that the facilities provided in the procurement of these means of production should in part contribute to guaranteeing the upswing of technical innovation on the family farm level.

In summary, within the context of in-kind loan grants, special attention must be given both to the individual farmer and to cooperative structures because of the slow current development of the latter and because of the preponderance of individual farms.

G. Livestock and Animal Husbandry Management Method

1. Livestock

Livestock on the province level is mainly of the following species:

- beef cattle
- goats
- sheep
- hogs
- poultry

Donkeys and horses are rather rare.

a. Beef Cattle

According to Table 96, we find that 34.9% of the households surveyed have beef cattle with an average of 6.5 head for each of these farms and 2.3 for all of the households surveyed taken together.

We detect that highest proportions of farmers owning beef cattle are in the district of COBLY, BOUKOUMBE, KEROU and KOUANDE. Among the nationalities, the PEULH group has the highest percentage of households owning beef cattle (69.9%, Table 97) with an average of 21.9 head per owning household.

b. Goats

Among agricultural households surveyed, 55.6% own goats with an average of 5.1 goats per household, as against 2.8 goats for all the households owning goats

in the districts of COBLY, MATERI, BOUKOUMBE and TANGUIETA. The OTAMMARI nationality shows the highest percentage of farmers owning these animals (71.3%).

c. Sheep

We find that 38.6% of the households surveyed own sheep with an average of 5.7 animals per household as against 2.2 for all of the farms surveyed. The highest percentages of households owning these animals again are found in the districts of COBLY, MATERI, and TANGUIETA. The PEULH group shows the highest percentage of households for this species. In spite of the high percentage, we cannot deduce anything for the FON group and those groups categorized under the term "MISCELLANEOUS" because of the limited of field data.

d. Hogs

We find hogs among 33.1% of the agricultural households surveyed. Their average distribution comes to 4.1 animals for these households and 1.4 for all of the households surveyed. Once again, the districts of COBLY, MATERI and TANGUIETA as well as BOUKOUMBE have the highest percentages of households owning such animals.

e. Poultry

At first sight one might think that all agricultural households have poultry; but this is not the case since only 74% of the households surveyed have

poultry. Their average distribution shows 11.2 animals per household and 8.3 for all of the households surveyed. The districts where these animals are mostly found are MATERI, BOUKOUMBE, COBLY, NATITINGOU, COPARGO and TANGUIETA.

The proportions of households owning animals by species are summarized in the tables below, by district and by nationality.

For greater detail, the reader may refer to Table 96 and 97. The following data are indicated at the bottom of each of these Tables:

- (1) in the 1st row, the averages, by species, relative to the total number of households surveyed.
- (2) on the 2nd row, the averages, by species, relative to households owning such animals.

**PROPORTIONS OF FARMS OWNING ANIMALS
BY SPECIES, BY DISTRICT (%)**

DISTRICTS	BEEF CATTLE	GOATS	SHEEP	HOGS	POULTRY
BASSILA	8.7	34.8	34.8	2.2	52.2
BOUKOUMBE	54.7	81.1	47.4	65.3	93.7
COBLY	69.4	94.4	77.8	80.6	89.9
COPARGO	39.6	36.2	22.9	31.2	85.4
DJOUGOU URBAIN	4.3	26.1	17.4	0.0	30.4
DJOUGOU RURAL	31.3	38.6	34.9	1.2	65.1
KEROU	54.2	50.0	50.0	4.2	55.8
KOUANDE	51.4	34.3	37.1	0.0	68.6
MATERI	38.9	91.5	64.8	73.2	97.8
NATITINGOU	21.7	61.7	6.7	36.7	86.7
OUAKE	27.1	52.1	39.6	29.2	62.5
PEHUNCO	47.2	19.0	44.4	2.8	72.2
TANGUIETA	12.5	62.5	58.3	62.5	83.3
TOUCOUNTOUNA	2.8	13.9	0.0	19.4	36.1
PROVINCE ATACORA	34.9	55.6	38.6	33.1	73.8

**PROPORTIONS OF AGRICULTURAL HOUSEHOLDS OWNING ANIMALS
BY SPECIES ACCORDING TO NATIONALITY (%)**

NATIONALITIES	BEEF CATTLE	GOATS	SHEEP	HOGS	POULTRY
FON	33.3	66.7	33.3	50.00	83.3
BARIBA	37.7	33.7	24.5	1.9	40.4
DENDI	20.0	36.0	32.0	0.0	28.0
DJOUYOU	30.3	47.4	31.4	16.6	66.3
PEULH	65.9	14.6	58.5	0.0	95.1
OTAMMARI	36.9	71.3	42.3	57.1	83.6
YORUBA	6.9	22.6	25.8	0.0	32.3
MISC.	35.3	88.2	76.5	35.3	100.0
PROVINCE					
ATACORA	34.9	55.6	38.6	33.1	73.8

f. Distribution of Animals by Species According to Farm Size

A study of Table 98 shows that the farm size does not seem to influence the size of the livestock herd and more particularly beef cattle. This finding undoubtedly reflects the problem of integrating agriculture and animal husbandry into the traditional production system. We note that herd management is rarely mixed with farm management.

2. Animal Husbandry Management

Animal husbandry is a secondary activity for the farmers. The methods of managing animal herds differ according to the type of animal husbandry involved.

Goats and sheep are easy to maintain because they can find their fodder by themselves; they also get food waste from the agricultural household as well as harvest gleanings. The only constraints on keeping small animals continue to be the obligation to keep the animals in an enclosure or to tie them up during the crop cultivation period to prevent any damage to crops. During that period of time, the peasant is thus obligated to provide for their feeding. This is sometimes an annoyance for the peasant who is already heavily burdened by agricultural work. In view of these difficulties, some farmers get rid of a portion of their livestock by moving the animals into commercial channels.

While small animal management seems to be associated with farm management, the same is not true of large animals. In most cases, agricultural households entrust the keeping of beef cattle to PEULH stockmen in return for a certain remuneration. Depending upon the case involved, this remuneration can take several forms:

- supply of milk,
- sum of money, varying according to the size of the herd,
- gift of animals upon calving,
- percentage of sales price at time of commercial sale.

Here again, the fodder consists almost exclusively of natural pasturage. Only 5% of the households surveyed are purchasing fodder for animal husbandry purposes (Table 76). Among all nationalities, the PEULH group displays the greatest inclination toward animal fodder purchase; 37.5% of the PEULH households surveyed declared that they

purchased fodder for their herds. Among the districts, the highest percentage of households purchasing fodder for the animals (25%) is found in the district of KOUANDE.

Animal health is not the subject of any particular concern on the part of agricultural households. Table 77 shows that less than 7% of the households surveyed purchase veterinary products. Once again, the PEULH group shows the highest percentage of households purchasing veterinary products (35.9%).

H. Cultivation Practices Employed by Farmers

1. Fertilizer Use

Only 8% of the household surveyed declared that they used fertilizer during the farming year covered by the survey. There are very few peasants who manure their fields. This situation is reflected on the level of the districts and the nationalities which do not present any significant difference among each other (Table 66).

We find that there is no significant relationship between the practice of manuring and the size of the farm (Table 67) and the age of the farm head (Table 68). This practice does not seem to be related either to the farmer's education level (Table 69).

Table 70 shows the distribution of farmers who did not use fertilizer according to categories of reasons. Among all of the reasons given, we can classify in order of importance:

- Lack of money	45.2%
- Lack of need	23.7%
- Did not know how to obtain	13.7%
- Product not available	9.9%

It appears that fertilizer use is a financial investment for the peasant who perhaps does not want to accept the risk of this investment because of his limited financial resources. Certain peasants do not see the need for using chemical fertilizer since the practice of burning an area where land is not yet a limiting factor enables them to farm without chemical fertilizer.

Lack of money seems to be the dominant reason both on the district and the nationality levels with the exception of the districts of PEHUNCO, COPARGO and BASSILA, and then the PEULH and YORUBA groups for whom the lack of need is the main reason.

2. Attitude Toward Yields

More than half of the farmers surveyed, 58.8%, do not expect a good yield from their farms during the farming year investigated (Table 71). However, in certain districts and among certain nationalities, at least half of the peasants do expect good yields. They are as follows:

Districts of:

TOUCOUNTOUNA	50.0%
DJOUGOU RURAL	50.7%
KOUANDE	51.4%
BASSILA	62.2%
TANGUIETA	69.6%

DJOUGOU URBAIN	75.0%
PEHUNCO	77.8%

Nationalities:

MISC.	57.1%
FON	66.7%
PEULH	70.0%
DENDI	84.7%

An examination of Tables 72, 73, and 74 shows that there is no significant relationship between the achievement of good yields and:

- The farm's size,
- The number of active individuals,
- The farm head's age.

The districts and nationalities do not present any particular difference.

Several causes have been cited in an effort to explain the poor yields expected. The most essential ones are as follows, in order of importance:

The drought	38.8%
Lack of fertilizer	28.2%
Lack of manpower	13.5%
Diseases	11.4%

These findings are also reflected on the level of the districts which do not present any significant differences among each other.

3. Seed Varieties and Their Supply Sources

a. Cotton Varieties

Table 79 shows that 53.8% of the farms that grew cotton used the selected variety while 42.2% used the local variety.

It must be emphasized that the selected variety of cotton is distributed at the start of each farming year to farmers growing cotton. The 42.2% of the farmers who use the local variety indicated in this Table is probably a recording error.

b. Corn Varieties

Table 80 shows that 89.6% of the farmers who grew corn used the local variety and 10.4% used the selected variety.

The proportion of peasants by source of supply are as follows:

Selected Varieties

CARDER	8 farmers or	40%
On the farm	9 farmers or	45%
Neighbor's farm	1 farmer or	5%
Market	1 farmer or	5%
Miscellaneous	<u>1 farmer or</u>	<u>5%</u>
TOTAL	20 farmers or	100%

Local Varieties

On the farm	165 farmers or	95.4%
Neighbor's farm	5 farmers or	2.9%
Market	2 farmers or	1.1%
Miscellaneous	<u>1 farmer or</u>	<u>0.6%</u>
TOTAL	173 farmers or	100.0%

c. Peanut Varieties

According to Table 81, 29.3% of the peasant planted the selected variety and 70.7% planted the local variety.

The proportions of farmers who grew peanuts are distributed as follows according to supply sources:

CARDER	32 farmers or	74.4%
On the farm	5 farmers or	11.6%
Neighbor's farm	0 farmer or	0.0%
Market	6 farmers or	14.0%
Miscellaneous	<u>0 farmer or</u>	<u>0.0%</u>
TOTAL	43 farmers or	100.0%

Local Varieties

On the farm	86 farmers or	82.7%
Neighbor's farm	2 farmers or	1.9%
Market	13 farmers or	12.5%
Miscellaneous	<u>3 farmers or</u>	<u>2.9%</u>
TOTAL	104 farmers or	100.0%

d. Sorghum Varieties

In examining Table 82, we find that 95.3% of the farmers who grew sorghum used the local variety and 4.7% used a variety other than the local variety.

Here are the proportions of farmers by supply sources:

Local varieties

On the farm	515 farmers or	97.0%
Neighbor's farm	12 farmers or	2.2%
Market	3 farmers or	0.6%
Miscellaneous	1 farmer or	0.2%
CARDER	<u>0 farmer or</u>	<u>0.0%</u>
TOTAL	531 farmers or	100.0%

Variety other than local

On the farm	14 farmers or	53.6%
CARDER	9 farmers or	34.6%
Market	3 farmers or	11.5%
Neighbor's farm	0 farmer or	0.0%
Miscellaneous	<u>1 farmer or</u>	<u>0.2%</u>
TOTAL	27 farmers or	100.0%

e. Rice Varieties

Table 83 shows that 83.3% of the farmers who planted rice used the local variety and 16.7% used the selected variety.

Here is the distribution of farmers as a function of supply sources:

Selected varieties

CARDER	15 farmers or	51.7%
On the farm	10 farmers or	34.5%
Market	<u>4 farmers or</u>	<u>13.8%</u>
TOTAL	29 farmers or	100.0%

Local varieties

On the farm	131 farmers or	90.3%
Neighbor's farm	7 farmers or	4.2%
Market	6 farmers or	4.2%
Miscellaneous	<u>1 farmer or</u>	<u>0.7%</u>
TOTAL	145 farmers or	100.0%

f. "Miscellaneous" Varieties

We find that 93.7% of the peasants grew local varieties of seeds grouped under the term "miscellaneous", whereas 6.3% used selected varieties.

The supply sources are distributed as follows:

Local varieties

On the farm	489 farmers or	97.0%
Neighbor's farm	9 farmers or	1.8%
Market	3 farmers or	0.6%
Miscellaneous	<u>3 farmers or</u>	<u>0.6%</u>
TOTAL	504 farmers or	100.0%

Selected varieties

On the farm	21 farmers or	61.8%
CARDER	6 farmers or	17.6%
Market	4 farmers or	11.8%
Neighbor's farm	3 farmers or	8.8%
Miscellaneous	<u>0 farmers or</u>	<u>0.0%</u>
TOTAL	34 farmers or	100.0%

Apart from cotton, the majority of the peasants get their seeds from their own harvest. Besides, the use of local varieties is still a dominant practice.

4. Years of Cultivation and Duration of Fallow

Under the traditional system, the field is left fallow after 3 or 4 years of cultivation. Fallow period lasts 4 to 5 years.

The duration of cultivation is longest (6.2 and 5.2 years, respectively) in the districts of TANGUIETA and KEROU. The district of BASSILA presents the longest

duration of fallow or 11.5 years. Among the nationalities, it is the YORUBA group which practices the longest period of fallow with 15.2 years of fallow.

The recapitulative tables below show the distribution of average and modal durations of fallow, by district and by nationality.

DISTRIBUTION OF MEAN AND MODE OF YEARS OF CULTIVATION
AND MEAN AND MODE OF FALLOW DURATIONS
BY DISTRICT

DISTRICT	CROP DURATION		FALLOW DURATION	
	MEAN	MODE	MEAN	MODE
BASSILA	4.3	3.0	11.5	3.0
BOUKOUMBE	4.1	3.0	3.6	4.0
COBLY	4.9	5.0	5.8	5.0
COPARGO	2.9	3.0	6.4	8.0
DJOUGOU URBAIN	2.7	2.0	3.1	4.0
DJOUGOU RURAL	2.7	3.0	5.5	4.0
KEROU	5.2	5.0	6.6	3.0
KOUANDE	4.3	5.0	4.0	3.0
MATERI	4.8	5.0	4.2	5.0
NATITINGOU	3.4	3.0	4.4	4.0
QUAKE	3.0	3.0	4.4	5.0
PEHUNCO	3.2	3.0	3.8	3.0
TANGUIETA	6.2	6.0	5.1	3.0
TOUCOUNTOUNA	4.8	3.0	5.3	3.0
PROVINCE ATACORA	3.9	3.0	5.1	4.0

**DISTRIBUTION OF MEAN AND MODE OF YEARS OF CULTIVATION
AND MEAN AND MODE OF FALLOW DURATIONS
BY NATIONALITY**

NATIONALITIES	CROP DURATION		FALLOW DURATION	
	MEAN	MODE	MEAN	MODE
FON (n = 6)	3.5	3.0	6.3	5.0
BARIBA (n = 53)	3.4	3.0	4.2	3.0
DENDI (n = 25)	3.6	2.9	4.0	4.0
DJOUYOU (n = 174)	2.9	3.0	5.3	4.5
PEULH (n = 35)	3.4	3.0	3.9	3.0
OTAMMARI (n = 303)	4.6	3.0	4.6	4.0
YORUBA (n = 31)	4.7	4.0	15.2	20.0

5. Practice of Irrigation

Agriculture is practiced in the form of dry cultivation and there is almost no irrigation. A little more than 1% of the farmers interviewed stated that they practiced irrigation and this is done for the most part in the case of truck gardening crops.

I. Product Gathering

In the course of this survey, we also collected data on the gathering activities of agricultural households. These activities generally took place during the slack season in crop cultivation. Gathering involves several products, the most

important ones of which are shea tree nuts, nere seeds and baobab seeds.

Although gathering is not an exclusively female activity, it nevertheless remains a fact that processing and preparing these products continues to be women's work.

Tables 101, 103, and 105 show the distribution of farm households according to quantities of each production gathered.

1. Shea tree (*Butyrospermum paradoxum*)

The shea tree is a tree which is found in the Sudanese savannas. These trees are of economic importance; the farmers often keep them in place when they lay out their crop fields.

The product supplied by this tree is the shea nut which is an oil crop that gives us "shea butter".

During the harvest period, which extends from June until October, the women go through the forest to collect the fallen fruit.

2. Nere seeds (*Parika biglobosa*)

This is a tree in the same ecological zone as the shea tree. Its fruit is very important in the diet. The pulp which surrounds the seeds is edible. The processed seeds are the subject of commercial transactions.

3. Baobab seeds (*Adansonia digitata*)

This a tree of the Sahelian-Sudanese regions; it has many uses:

- the bark can be used to make ropes,
- the leaves are consumed as a vegetable when they are young.

The fruit, called "monkey bread", yield an edible flour-like and acidulous pulp. However, it is especially the seeds that are most in demand because they are also the subject of commercial transactions and they play a big role in nutrition during the interim period.

Below we present, for each of these products, the average quantities harvested, sold, and consumed locally, per household, and according to the nationalities (in terms of kg).

MEAN DISTRIBUTION OF QUANTITIES OF SHEA NUTS
(*Butyrospermum paradoxum*)
GATHERED, SOLD, AND LOCALLY CONSUMED
PER HOUSEHOLD AND PER NATIONALITY
(kg)

NATIONALITIES	GATHERED	SOLD	CONSUMED LOCALLY	STOCK
BARIBA	172.9	83.7	113.5	(-24.3)
DENDI	49.6	43.9	23.3	(-17.6)
DJOUYOU	135.0	116.4	71.4	(-52.1)
OTAMMARI	94.8	60.3	61.8	(-27.3)
PEULH	92.0	54.3	54.5	(-16.8)
ATACORA	112.0	77.6	69.5	(-35.1)

MEAN DISTRIBUTION OF QUANTITIES OF NERE SEEDS
(Parika Biglobosa)
GATHERED, SOLD, AND LOCALLY CONSUMED
BY HOUSEHOLD AND BY NATIONALITY
(kg)

NATIONALITIES	GATHERED	SOLD	LOCALLY CONSUMED	STOCK
BARIBA	95.3	48.6	69.1	(-22.4)
DENDI	70.0	46.7	29.4	(-6.1)
DJOUGOU	52.8	52.3	19.7	(-19.2)
OTAMMARI	79.1	35.4	66.1	(-22.4)
PEULH	66.1	38.4	50.3	(-22.6)
ATACORA	78.4	45.9	60.7	(-28.2)

MEAN DISTRIBUTION OF QUANTITY OF BAOBAB SEEDS
(Adansonia Digitata)
GATHERED, SOLD, AND LOCALLY CONSUMED
BY HOUSEHOLD AND BY NATIONALITY
(kg)

NATIONALITIES	GATHERED	SOLD	LOCALLY CONSUMED	STOCK
BARIBA	-	-	-	-
DENDI	-	-	-	-
DJOUGOU	14.5	-	7.8	-
OTAMMARI	77.6	57.0	65.5	-
PEULH	-	-	-	-
ATACORA	75.0	51.9	63.5	-

As we can see, the sum of quantities sold and consumed locally for each of these products is greater than the average quantity gathered during the farming year covered

by the survey. In the course of their statements, the households certainly should have reported stocks from the preceding year.

However, these statistics must not be taken literally as they have not been subjected to a systematic survey and since they were estimated on the basis of statements made by households surveyed. Furthermore, the very small number of field data persuades us not to draw any conclusions as to the districts.

J. Main Crops

The results on the seed plot densities and yields cannot be presented due to a number of difficulties encountered with the computer firm responsible for the analysis of this study. Much of the data have errors resulting from keypunching mistakes.

However, the main crops studied are presented according to surface area and proportion of farms achieving their yield.

The surface areas given are actual areas obtained after converting the mixed crop areas into single crop area using the proportional areas.

Sorghum

This is the main crop of the province covering 41.5% of the sampling area and is cultivated by 79.8% of households surveyed.

Millet

53.2% of households surveyed cultivate millet and cover 17.9% of the sampling area.

Yam

The yam covers 16.0% of the area studied and is produced by 76% of the households surveyed.

Fonio

It is produced by 12.7% of household surveyed and it covers 5.6% of the area studied.

Voandzou

22.3% of the surveyed households cultivate the voandzou and it uses 4.4% of the cultivated areas.

Corn

Corn covers 4% of the surveyed areas and it is cultivated by 22.2% of the households surveyed.

Bean

It is cultivated by 28.2% and covers 2.3% of the area.

Peanuts

13.9% of the households cultivate peanuts which cover 2.3% of the area.

Cassava

In the province, the cassava crop is little developed covering 1.8% of the areas surveyed and is cultivated by 13.2% of the households.

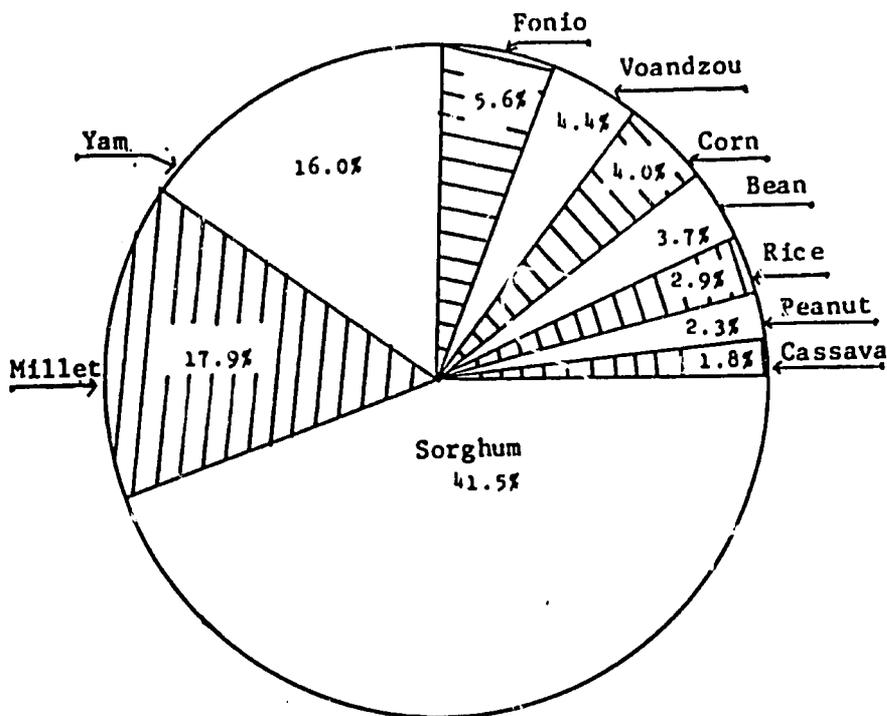
The table below gives a distribution of these various crops according to the proportion of the areas covered.

DISTRIBUTION OF THE MAIN CROPS

CROPS	AREA		FARMS	
	Ha	%	Number	%
SORGHUM	412.89	41.5	532	79.8
MILLET	178.11	17.9	357	53.2
YAM	159.25	16.0	507	76.0
FONIO	56.19	5.6	85	12.7
VOANDZOU	43.40	4.4	149	22.3
CORN	39.69	4.0	148	22.2
BEAN	35.49	3.7	188	28.2
RICE	29.05	2.9	113	19.9
PEANUT	22.77	2.3	93	13.9
CASSAVA	17.42	1.8	88	13.2
TOTAL	994.26	100.0		

The graph below shows the relative importance of the main crops in ATACORA as to cultivated areas and that sorghum prevails over all other crops.

RELATIVE IMPORTANCE OF MAIN CROPS
IN ATACORA



As already mentioned, these are actual surface areas and do not refer to developed surface areas although certain crops are mixed namely corn and sorghum, sorghum and millet, millet and yam, as shown in Table 29 referring to types of mixed crops.