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CHANGING PATTERNS OF GRAIN
 PRODUCTION IN A RESETTLEMENT
 SCHEME IN UPPER VOLTA:
 A Report for the Center for
 Women in Development, South-East
 Consortium for International
 Development

Della McMillan

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Center for African Studies and Department of Anthropology
 University of Florida

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I. SUMMARY

This study examines the impact of a large-scale planned settlement scheme on intra-household patterns of grain production and distribution. The project, the Volta Valley Authority (Amenagement des Vallees des Volta or AVV) is the Upper Volta government agency in charge of the settlement and development of Upper Volta's land in the Onchocerciasis (river blindness) Control Program (OCP). The agency has attempted a capital intensive program of planned settlement and agricultural extension in the disease control area.

The baseline research, conducted over a two-year period (April 1978 - April 1980), focused on a single group of settlers originating from the same home village in the Kaya region of the Central Mossi Plateau. The research was funded through a grant from USAID through the Department of Agricultural Economics, Purdue University (AID/AFR-1257). A Technical Assistance ~~Grant~~ ^{Fellowship} P from SECID's (South-East Consortium for International Development²) Center for Women in Development provided an opportunity to return to Upper Volta and work with the same group of settlers. At the time of the re-study (July-August 1983), the Kaya settlers had been living at the AVV from five to eight years. They were well acquainted with the use of animal traction, and had paid the larger debts incurred in establishing their farms.

The study shows that in the settlers' home area (Kaya), the wife or wives and married sons associated with an individual household, traditionally farmed a separate portion of the family land. These private fields are not inherited but their

cultivation is seen as the "right of the individual" who claims sole access to the harvest. Some of the products from the private fields are sold and the income then used to meet the needs of the individual or, in the case of women, the needs of their children. A portion of the cash is normally used to purchase goods and livestock and to invest in non-agricultural activities such as trade and beer-making.

The study indicates that very little consideration was given to the tradition of private cultivation in the original design of the AVV. Nonetheless, by the end of the fifth year most settlers had reinstated private fields. The role of this private agricultural production, however, was substantially reduced. Not only did the settlers cultivate a much smaller percentage of the total area allotted as private fields, but the produce from these fields comprised a smaller percentage of total grain production (from 13 to 4 percent) and the cash value of women's production (from 15 to 3 percent) was relatively smaller than in the home area. Although the semi-autonomous production activities of the women were reduced, women still contributed about one-half of the adult labor hours recorded for the cooperative fields.

This "streamlining" of intra-household production is attributed to a variety of factors that were involved in the establishment of the new farms. In the early years most settlers were hard pressed to meet the minimum labor demands of their official fields. As a result, they had very little time for private cultivation. In addition, one of the most important economic roles of the private fields, that of providing supplementary food

and income for sub-household units, was reduced since, by the fifth year in the project, most AVV settlers were able to feed their families from the main household fields--not only feed them, but feed them much more adequately than the average Kaya farmer. In 1979 the settlers' per worker production of the basic food grains was two to three times the recorded figure for the home area (an average of 902 kilograms per unit labor and 384 kilograms per resident versus 360 kilograms per unit labor and 117 per resident in the home area). Net agricultural income was about three times the average figures for the home area.

In contrast to the settlers' home area, almost all of the privately produced grain was sold rather than used for family consumption and the male household head had assumed responsibility for purchases (meat, condiments, school materials, and basic clothing), using income generated from cooperative fields. The grain produced by women in the AVV was sold at or immediately following harvest; the grain produced on the cooperatively worked fields was marketed in the months just before the main harvest. The cash that women earned from their sales was generally used to purchase livestock or for personal needs such as jewelry, travel, clothes, or gifts to family and friends.

The follow-up study shows that the integration of AVV women into grain production and new income earning activities is not consistent. Rather it is importantly influenced by child-rearing responsibilities, marital status as first or second wife, whether or not a particular woman has an elder son who is still cultivating with the father, and whether or not she has local relatives.

Two major conclusions may be drawn:

1. The Existence of Overlapping, Semi-autonomous Production and Consumption Units. For certain purposes and during certain times of the year, a single household may function as a series of overlapping, semi-independent units of grain production, consumption, and marketing. This includes the subdivision of household land, management decisions, and labor between private and cooperative production.

2. The Design of Agricultural Policies to Benefit Women.

The integration of women into both food production and marketing is neither fixed nor consistent over time but related to a wide variety of changing variables. Some of the village and household-level factors include: population pressure; internal patterns of household organization (i.e. the presence or absence of sub-household units such as married sons, older and/or widowed wives, and inherited wives from deceased brothers and uncles); labor demands on the cooperatively worked non-food crops --in this case, cotton ; per capita food production on cooperatively worked fields; and distance from local markets.

The integration of women into grain production may also vary over the life-cycle of an individual woman, depending on her child-rearing responsibilities; the relationship of her older male children to the male household head; her relationship to the male household head; level of education; physical health; the status of her family before marriage; and the presence or absence of local relatives from her own lineage. A combination of these factors can have an important impact on the amount of time a

woman has to devote to private and cooperative agricultural activities. These factors may also affect her production goals. Any project which fails to consider these very real differences in opportunity, background, and leadership ability in the design of policies and extension programs to benefit women is operating under a false assumption of "homogeneous" woman-kind.

It is important, therefore, for policy-makers to address the following:

1. How important are independent grain production, consumption and marketing activities?
2. What is the role of independent and cooperative production activities for the internal organization of the household? For example, how do these independent production activities affect the economic and social role of a woman vis-a-vis her husband or the ability of the farm family to incorporate married sons and their families?
3. How does the existence of overlapping production and consumption units and the differential integration of women into grain production and marketing affect our understanding of:
 - a. women's economic and social roles within the society;
 - b. the structure and organization of the typical farm household;
 - c. the farming system as a whole; and
 - d. the factors which influence the willingness and ability of farm families to adopt new technology and participate in extension programs?

Specific recommendations for extension, project evaluation and marketing research include:

1. Research and Evaluation
 - a. the need to integrate micro-level studies of intra-household patterns of production, consumption and marketing into more broadly based surveys and evaluation programs;

- b. the need for more longitudinal approaches to the study of social responses to technical innovation;
 - c. the need to consider child-rearing responsibilities, age, and position within the household in research and project designs;
 - d. the need to consider:
 - 1. the role of grain marketing decisions and non-market exchange networks in the household economy;
 - 2. the quantitative significance and goals of non-market exchange;
2. Technology Design and Extension
- a. the need to modify the design of technology and extension programs so that they are:
 - 1. appropriate for women farmers; and
 - 2. sensitive to the particular needs of different types of women farmers; and
 - b. the need for on-farm tests of new varieties and technology for women farmers.

I. INTRODUCTION

A growing literature focuses on the major role that African women play in food production. Boserup (1970:20) states that in large parts of Africa women "do more than half the agricultural work; in some cases they were found to do around 70 percent and in one case nearly 80 percent of the total." Although differences exist between regions, a comparison of agricultural labor force participation rates provided by the International Labour Office and the United Nations Food and Agriculture Organization shows that on the average 46 percent of the agricultural labor force in Sub-Saharan Africa is female; in North Africa and the Middle East, 31 percent is female (Dixon 1982). It is not uncommon to find that in areas of high out-migration and cash-cropping, almost all food is produced by women (Spring 1983; Fresco 1982). Women may also farm a separate piece of land from which they alone derive the benefits (McMillan 1983, Koenig 1980). In addition to their role in cultivation, women traditionally are responsible for preparing, handling, storing, and selling food (Gladwin 1975; Merryman 1980; Haugurud 1982; Ensminger 1983).

Despite the significance of their contribution, there has been a strong tendency to ignore the contributory role of women in the design of new agricultural technology, indicating a lack of sensitivity to the economic role of private production within the family and women's role in managerial decisions.

This tendency to overlook women has been particularly true in the case of planned settlement. Where evaluation research has

addressed the impact of planned settlement on women, it has generally shown a decline in the relative economic and social status of women and their role in managerial decisions (Guissou 1977; Conti 1979). As a result, this type of large-scale development project has become a favorite target of criticism for scholars and aid agencies concerned with women (Madeley 1980; Reyna 1981).

There is increasing evidence, however, that most land settlement schemes pass through a series of three to five-year stages in terms of settler adjustment, economic performance, community development, and the settlers' willingness to modify the recommended program (Chambers 1969; Colson 1971; Nelson 1973; Moran 1979; Scudder 1981). Scudder (1981) suggests that during the first two or three years when settlers are adapting to their new physical, social and production environment, they typically:

adopt a conservative status, their first priority being to meet their subsistence needs.... They favor continuity over change; and where change is necessary, they favor incremental change over transformational change.

The transition phase ends when enough settlers "shift from a conservative stance to a dynamic open-ended one, hence initiating a third stage of economic and social development" (ibid.). This transition usually occurs when settler security has increased due to the production of sufficient food and the growing tendency of the settlers to feel more "at home" in their new environment (ibid.). It is also at the point when they have generally completed the most difficult and time-consuming work involved in setting up the new farms. In this third stage one expects to

find a greater diversification in family organization, household and intra-household patterns of production, economic and social roles, and marketing. Unfortunately most evaluations of planned settlement deal with projects that are still in their initial stages.

It is the purpose of this paper to describe the longitudinal impact of a major land settlement scheme on women's economic roles. The study focuses on the changing role of women in grain production and marketing. The first section provides background information on the project, the Volta Valley Authority (AVV), and the local SECID/USAID project that supported the research --the Upper Volta Grain Marketing Development Project. This is followed by a brief discussion of research methods. The third section describes the traditional patterns of food production and marketing in the settlers' home area and compares these with the settlers during different time periods. The final section focuses on policy implications.

II. BACKGROUND

A. The Volta Valley Authority (AVV)

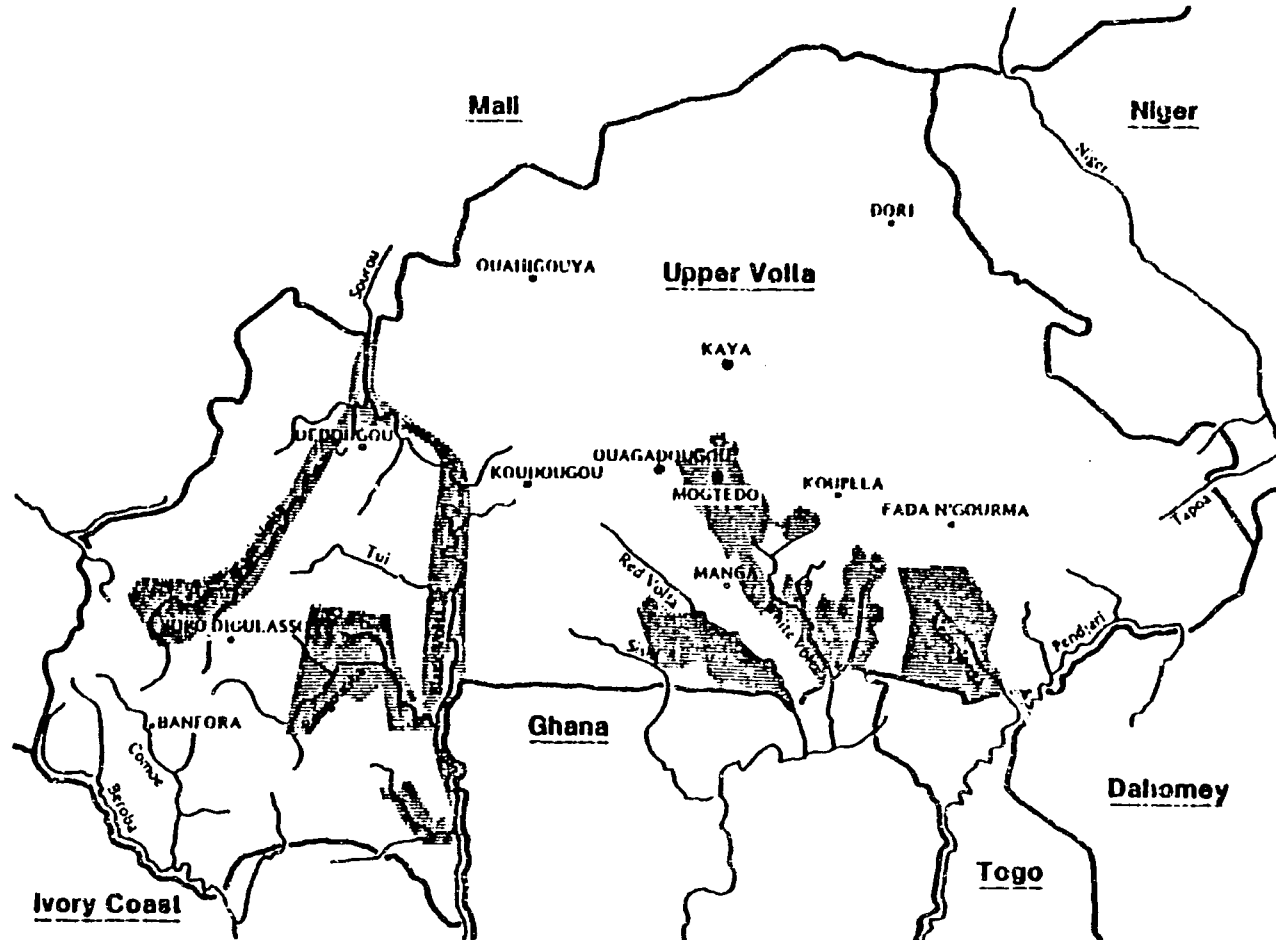
The Volta Valley Authority (AVV) is the agency of the Upper Volta government charged with the settlement and development of Upper Volta's land covered by the Onchocerciasis Control Program (OCP).¹ In 1974 the AVV was given complete control of some 30,000 square kilometers covered by the control program. The land represents about twelve percent of Upper Volta's total land area and includes all or most of the valleys of the Red, White and Black Volta Rivers (Figure 1). The original goals of the project were:

1. to organize the immigration of voluntary settlers from more densely populated parts of the country to planned settlements based on irrigated and non-irrigated agriculture in the decontaminated river basins;
2. to promote the settlers' use of improved farming techniques in order to increase production and minimize the long-term ecological impact of higher population densities;
3. to increase Upper Volta's production of cotton and the basic food grains;
4. to enable the settlers to enjoy a higher standard of living than they could attain in their home areas; and
5. to promote regional economic growth in the areas of planned settlement.

This official mandate was declared for a twenty year period after which the agency would presumably disappear as an independent structure. Its activities would then be placed under the existing structure of regional and national development agencies (Ministries of Education, Rural Development and Health, Regional Development Organizations (ORD), etc).

Figure 1

LAND ASSOCIATED WITH THE VOLTA VALLEY AUTHORITY



Based on: Répub'ique Française, Ministère de la Coopération, Cartographie des pays du Sahel.

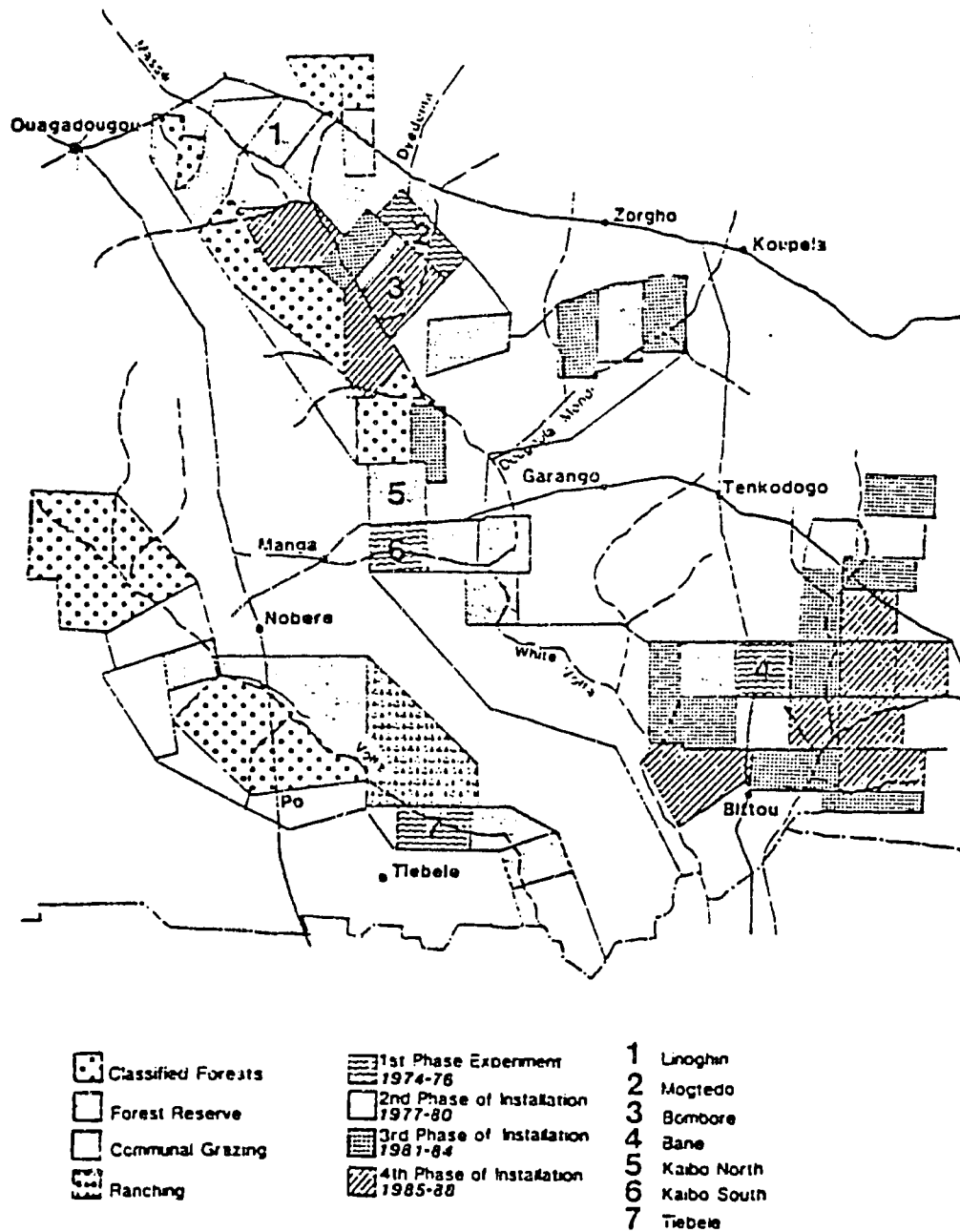
The original project was based on the progressive installation of groups of planned villages known as blocs (Figure 2) (the blocs that had been established in the White and Red Volta Valleys by 1979 and the settlement that was projected through 1986 are shown in Figure 3). The agency was responsible for selecting village sites; installing basic infrastructure (roads, wells, a school, a dispensary and extension-worker housing); recruiting, selecting and transporting settlers; and coordinating a number of social and economic services for the new villages. Figure 2 shows the official layout of the AVV village described in this study.

In return for the right to cultivate a farm in one of the planned villages, a settler is required to adopt a package of intensive cultivation practices. These include:

1. a new system of land allocation to control field layout, the total area planted in each of the major crops, and the total area cultivated per worker;
2. new production techniques such as monocropping, sowing in lines, thinning, and, after the second year in the project, cultivation with an ox-drawn plow; and
3. the use of new high yielding varieties of seed, chemical fertilizer, and insecticides.

During the first five years this development program was to be supervised by a dense network of extension workers that included one male agent for every twenty-five families and one female agent for every fifty families. It was anticipated that this ratio of extension workers to settler families would be gradually reduced in the older villages and that these reductions would continue until the AVV villages could be integrated into the extension services of the regional ORD's.

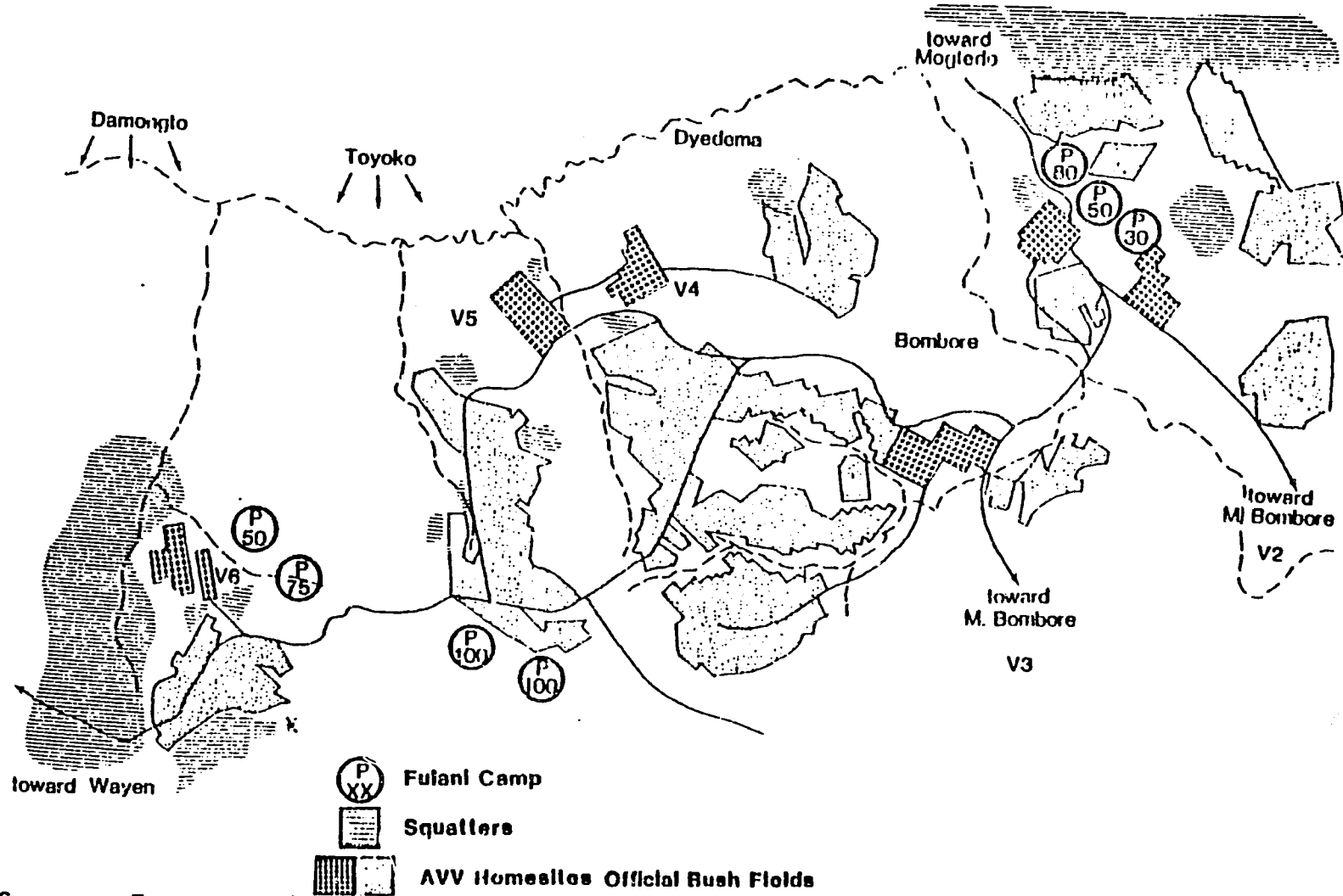
Figure 2
Projected Installation of AVV Village Clusters



Source: From a map by the AVV Extension Service.

Figure 3

Official Design of the AVV Bloc of Mogtledo Containing Six Villages



Source: From a map by the AVV Extension Service.

In addition to the extension program, the AVV provides a variety of credit, distribution, and marketing facilities to support the agricultural program. This includes one warehouse per village cluster at which the settler can purchase fertilizer, improved seed, pesticides, animal traction equipment, and spare parts. Most of the variable production costs, such as fertilizer, can be purchased on a short-term credit program with reimbursement occurring at the time of the cotton sale. Long-term credit (over five years) is used to finance the purchase of animal traction equipment such as plows and carts.

B. Projected Impact of the AVV Project on
Upper Volta Grain Production

The development of the Volta Valleys is said to offer a unique opportunity to increase Upper Volta's production of the basic food grains:

1. to introduce an intensive system of grain cultivation which would minimize the negative consequences of high population densities in the fertile Volta Valleys;
2. to raise farmers' yields by providing them with a richer piece of land and access to the complementary package of technology, non-labor inputs, and credit that would allow them to follow more intensive cultivation patterns;
3. to raise the settlers' net agricultural income and living standard; and
4. to provide a regional grain surplus which would allow the country to offset a large part of the projected food deficit for the next twenty years.

As such, the most effective means of integrating the AVV settlers into the national grain marketing system is of tremendous concern.

C. The SECID Upper Volta Grain Marketing
Development Project

It was the latter point that was the concern of the Upper Volta Grain Market Development Project which provided local support for the research. The overall objectives of the project are: (SECID 1982: 4): "to assist the government of Upper Volta to establish a set of conditions within the country that will lead to food self-sufficiency." The project has attempted to do this through a series of supports to improve the efficiency and managerial capacity of Upper Volta's National Cereals Office (OFANACER).³

II. METHODS

The research on which the present study was based was conducted in two periods:

1. a baseline study (April 1978-April 1980) which looked at the economic and social consequences of the AVV for a single group of settlers from the same home village; and
2. a follow-up study of the same group of settlers (July-August 1983).

The baseline study was funded by a grant from USAID through the Department of Agricultural Economics, Purdue University (AID/AFR 1257) and the follow-up research by a SECID/WID Technical Assistance ^{scholarship} grant.

A. The Baseline Study (April 1978 to April 1980)

The baseline research was conducted over two agricultural seasons from April 1978 to April 1980. The first year was spent at Damesma, a village from which more than thirty households had emigrated to the AVV. The second year was spent in the third village (V3) of the AVV village cluster of Mogtedo (nineteen of the forty-six households in V3 were originally from Damesma). The two sites were separated by about 120 kilometers (200 kilometers by the main roads) (Figure 1).

A farm management survey was used to gather information on production and income in each of the two settings--the AVV village and the "traditional" home village. The farm management survey of the settlers' home area included 35 households (11 percent of the recorded households) in the neighboring villages of Damesma, Bangasse, and Zorkoum in 1979 (Table 1) (The Damesma households that were included in the 1979 sample represented 8

percent of the recorded households in the village.). The farm management survey of the AVV village includes nine settlers from Damesma who had been living at V3 Mogtedo for periods of three to five years (19 percent of the recorded households in the village) and three Damesma households in the village cluster at Mogtedo-Bombore which had been at the project only one year.

B. The Restudy (July to August 1983)

The Technical Assistance ^{fellowship} grant made it possible to return to Upper Volta and work with the same group of Damesma settlers. The sample was enlarged from ten to twenty-six households. This

Table 1

Households Included in the Baseline and Follow-up Survey of the AVV and Kaya Villages

Village/Village Group	N. Sample	N. Total Village	% Total Village
<u>The Home Village Area (1979)</u>			
Kaya (All 3 Villages)	35	320	11%
Damesma	(12)	(155)	(8%)
<u>The AVV Village, V3</u>			
Settlers (1979) (All from Damesma)	9	47	18%
Settlers (1983) (Damesma and other Village groups)	26	47	55%

() The 12 Damesma households are included in the Kaya sample of 35. This includes 12 households from Damesma, 11 from Zorkoum and 12 from Bangasse for a total of 35.

included the ten original households from the 1979 research (one of the nine sample households containing two married brothers had split to form a separate farm in 1983), one additional household from Damesma, and fifteen households from each of the other home village groups (settlers from the area of Kaya but not from Damesma and settlers from Koupela).

The information gathered can be grouped into four categories:

1. Field Survey. A single form (Appendix One, Form 1) was used to record the areas of each parcel cultivated by a different person or group of persons. Other information gathered included: location of the field in the AVV cycle of rotations (e.g. whether or not the farmer was planting the required crop; use of pesticides and manure; date of planting and first weeding; and type of land preparation before planting and weeding. This information was then transferred to a code sheet to facilitate control and data entry (Appendix One, Form 2).

The fields for the ten settlers in the 1979 sample were measured with a metal tape to determine length, a compass to measure angles, and a hand computer to calculate area and closure error. This is the same method of measurement that was used in the baseline research in 1979. For the other sixteen households we simply measured length and width. When the old system of tape and compass measures was compared with calculations based on length and width, the difference between the two was only a few hundred square meters.

2. Socio-economic Study. A second group of forms dealt with: (1) the farmer's recollection of the amount he or she produced for each of the major crops in the preceding year; (2) the purchase and resale of livestock and livestock products; (3) the sale of agricultural products; (4) gifts received from Ivory Coast, spouses, the male household head, and from neighbors during harvest; (5) the number and present market value of livestock; (6) the existing and estimated market or resale value of certain capital goods such as bicycles, mopeds, houses and granaries; (7) the farmer's recollected income from off-farm production activities; and (8) the farmer's recollection of expenses incurred for agricultural production during the preceding year (Appendix One, Form 3). These questionnaires were addressed to each adult and teenage member of the twenty-six households.

3. Census. A third set of questionnaires focused on change in the size and composition of the settler households due to births, deaths, return migration, marriage, or immigration of additional family members (Appendix One, Form 4).
4. Project Records. The official records on family size and composition, purchases of equipment, and cotton sales were recorded for each of the V3 households.

The information from the V3 field survey, socio-economic study, census and project records, have been entered into the University of Florida computer system and have been subjected to elementary analysis. This information will eventually be analyzed in terms of a breakdown of income and field area by subhousehold units. These aggregate figures will then be added to the data set created for the 1979 sample households in order to compare the home village with the settlers during different time periods.

IV. RESULTS

A. Global Response to the AVV Agricultural Program

1. Limited Adoption of the Recommended Technical Package

The baseline survey of the Kaya settlers agreed with the AVV Statistical Service that the project's attempts to induce artificially the conditions of land scarcity which would encourage the settlers to adopt intensive cultivation practices did not succeed (Murphy and Sprey 1982; McMillan 1984). Specifically:

1. The settlers who had been at the project for shorter periods of time tended to follow the extension package more closely than those who had been there longer.
2. Cotton was the only crop on which the recommended package of intensive cultivation techniques was consistently applied. This includes monocropping, chemical protection, planting in rows, use of recommended quantities of fertilizer, thinning, timely weeding with animal traction and use of fertilizer.

This differential acceptance of agricultural innovations on particular crops and according to length of residence in the scheme was related to: (1) the higher level of supervision by the extension service in the early years; and (2) the extension service's primary focus on cotton which was used to reimburse settler credits to the project.

2. Positive Effects on Income

The project was more successful in its attempts to raise settler income. Although the average yields for sorghum were below the expectations of the project, they were two to three times higher than the recorded yields for Kaya (Table 2).

Table 2
Yields for Sorghum and Millet

Location	Crops	
	White Sorghum kg/ha	Millet kg/ha
Anticipated Yields (1975)	900-1000	--
Results from Statistical Service Survey (1979)	700- 900	--
Damesma Settlers (1979)	684	--
Damesma Home Village (1979)	201	275
Other two Kaya Villages (1979)	355	350

Source: McMillan 1983: 405.

By 1979 the older settlers were producing a quantity of grain that was about three times the average quantity per resident and per unit labor recorded for the settlers' home village (Table 3). This represents an average of 144 kilograms per resident or 515 kilograms per household above the FAO minimum food standards (McMillan 1983: 156).⁴ In contrast, the average household in the Kaya sample was producing 400 kilograms below the minimum food standard.

In 1979 the settlers' cash income from the sale of cotton and other agricultural products was 172,000 CFA per household (\$750) and 38,000 CFA (\$160-165) per unit labor using the AVV system of labor and consumption equivalents (Table 3). This is

seven times the recorded figures for the settlers' home village (38,000 CFA per unit labor versus 5,000) and represents an increase in sales from the equivalent of 16 to 39 percent of the recorded production of all crops. The study shows, however, that the increased income of the settlers is primarily due to an expansion of the total area cultivated and the natural fertility of new soils--not to the successful introduction of the AVV's package of technical innovations.

3. Transformation of Traditional Cultivation Practices

Although the project did not succeed in introducing the complete package of technological innovations, it has been associated with a number of important changes in the organization and distribution of production including:

1. increased access to land;
2. a radical shift in field structure and organization of the farms;
3. the introduction of new cultivation methods;
4. an increase in total labor though not in labor per unit land; and
5. higher production costs.

Table 3

Grain Production, Net Agricultural Income,
Labor and Sales in 1979
(per unit labor using the AVV system of labor
and consumption equivalents)

Production and Sales	Damesma Settlers n=9	Kaya	
		Damesma n=12	All 3 Kaya Villages n=35
Grain (kg)	902	271	360
Hours Worked (weighted)*	1,300	620	640
Gross Val. Prod (CFA)	88,000	29,000	31,000
Cash Costs Prod. (CFA)	13,000	1,500	1,000
Total sales (CFA)	38,000	5,000	5,000
Sales Cotton	28,600	---	---
Sales Other	9,700	---	---
Net Value Prod. (CFA)	75,000	28,000	30,000

* Uses the AVV system of labor equivalents. Each recorded hour for a female between the ages of 15 and 55 is counted as 0.75 of the standard "man hour"; a man between 15 and 55, is 1.0; a man over 55 as a 0.50; a woman over 55 as 0.25; a male child between 12 and 15 as 0.50; a female child between 12 and 15, as 0.25 (See page 29 for more discussion).

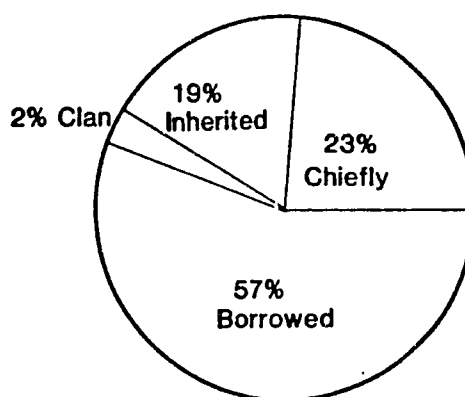
Methodology: The figures represent a weighted average over the sample households in each group. The gross revenue is equal to the total value of production minus the costs of all fertilizer, pesticides, and purchase of seeds. The cost of pesticides for protection of the seeds and harvest is not subtracted in order to be comparable with the Statistical Service Survey. The net agricultural income is equal to the gross revenue minus all out-of-pocket cash costs for animal traction. Since many of the farmers were paying off the equipment, their cash costs were 10,000 CFA per unit consumption lower than the estimated depreciation on the material (McMillan 1983:411).

4. Access to Land

In the settlers' home village, a household has access to land through a combination of inherited, customary, and borrowed rights (Figure 4.). Since the fields a farmer loans tend to be his worst fields or the fields that he is about to leave fallow, and a farmer will hesitate to use manure or fertilizer on a field that may be reclaimed, a high percentage of borrowed land is associated with lower income. Most of the AVV settlers came from poorer clans with smaller, lower quality holdings and a higher percentage of borrowed land. Therefore, the project's promise of registered land tenure was an attractive feature.

Figure 4

Distribution of Land Rights in the Settlers' Home Village



5. Field Structure and Organization of the Farm

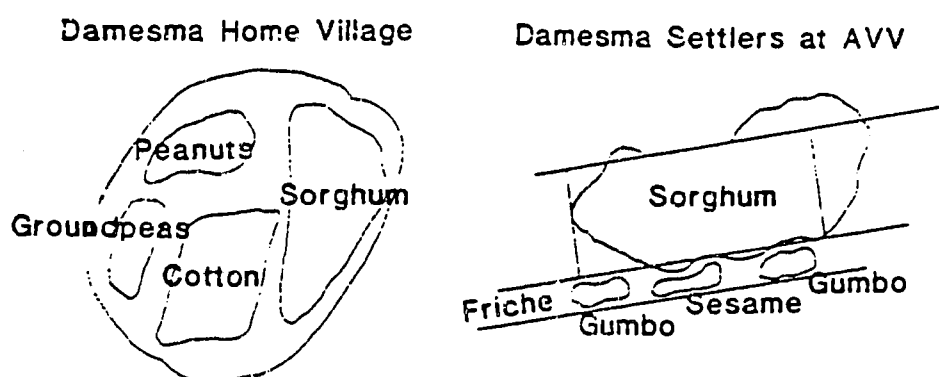
A typical farm in the settlers' home village may contain twenty to twenty-five parcels in four to five distinct locations or terrains. Each terrain may have a separate land tenure arrangement (for example, inherited by the household head or borrowed from a certain relative). One terrain might include as

many as eight separate parcels with different crops and different persons or groups of persons responsible for their cultivation (Figure 5).

In contrast the AVV bush fields are grouped by crop and year of installation on four areas that are dictated by the extension service. Although many of the settlers have enlarged the bush fields by as much as 25-30 percent, they have respected the basic AVV model of a single bush field (Figure 5).

Figure 5

Comparison of Field Structure for the Damesma Settlers and Kaya Villages



6. New Cultivation Methods

In 1979 the Damesma settlers' use of fertilizer was below the project plan (an average of 15 kg/ha versus the recommended 150 kg/ha for white sorghum; 83 kg/ha versus the recommended 150 kg/ha for cotton). Only 32 percent of the white sorghum received any fertilizer at all. This represented an average of 46 kg/ha for the 14 fields that received fertilizer and 15 kg/ha for all 43 fields.

Still the level of fertilizer use by the settlers was substantially higher than in the home area. In 1979, only one of

the 77 sorghum and millet fields at Damesma received any mineral fertilizer at all. While the settlers increased their use of mineral fertilizer, they tended to devote less time to some of the more traditional methods of preserving soil fertility such as spreading animal manure and straw.

Although the use of animal traction for operations other than plowing was below the recommended program, it was much higher than for the settlers' home area. Even the compound and private fields which were not under the control of the extension agent tended to be plowed before planting. Farmers who had no oxen paid 14,000-20,000 CFA to have their fields plowed by tractor or rented animal traction.

7. An Increase in Total Labor Though Not in Labor per Unit Land

The recorded labor time for the Damesma settlers was almost twice the recorded figure for the home village farmers (1200 weighted hours per unit labor versus 600) (Table 3). This was not, however, associated with any greater care in the performance of weeding. Rather the majority of the increase in total labor time is explained by the cotton harvest which extends several months beyond the other harvests. The settlers spent an average of 130 weighted hours per hectare weeding white sorghum and 217 hours per hectare for cotton. This compares with 268 weighted hours per hectare for white sorghum and 346 for cotton in the settlers' home village (McMillan 1983:397). By the fourth year when most settlers had repaid all or most of their initial debts, they tended to increase their interest in the extensive

cultivation of food grains which had a higher unit price as well as lower demands for cash and labor inputs.

8. Higher Cash Costs of Production

The higher AVV yields were associated with increased production costs. In 1979, the Damesma settlers spent an average of 20,000 CFA per household on fertilizer, seed, and pesticides. This was over ten times the amount the average home village household spent during the same time period (an average of 2,200 and 1,200 CFA per household).

The largest cash expenses were for the purchase and upkeep of animal traction equipment and animals. Some of the other costs of the equipment include settlers' use of special grain (usually the worst grain from their harvest or the hulls of the threshed grain) and purchased grain stalks (some of the settlers maintain that the stalks from the AVV varieties of sorghum are not as good for the animals as the traditional varieties and buy stalks from indigenous farmers). Another cost to the settler was the labor involved in maintaining the animals. This was most important during the rainy season when the oxen must be watched continuously to prevent their wandering into the fields or getting lost.

Even with the high costs of production that the settlers faced in 1979 (an average of 50,000 CFA for installment payments and the upkeep of the animals and 20,000 CFA for fertilizer, pesticides, and seed), the settlers' net agricultural income (after expenses) was still two to four times higher than the average income in their home area (Table 3). In addition, the

households which sold their animals in 1979 showed a one time cash profit of about 20,000 CFA after the purchase of new animals.

B. Changing Patterns of Production Within the Household

The AVV has been associated with a number of important changes in the organization of production and distribution within individual households. This is one aspect of the project which has had a major effect on women.

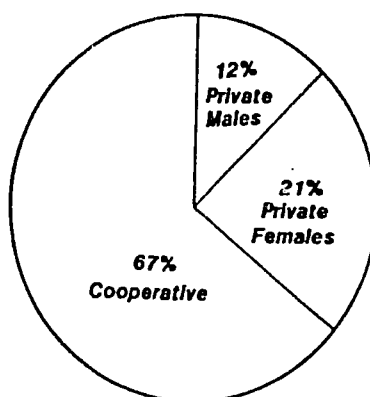
1. Household Organization of Production in the Settlers' Home Village

Land

In the settlers' home village, the total area of inherited, customary, and borrowed land to which a household has access is subdivided into privately and cooperatively worked fields (Figure 6).

Figure 6

Subdivision of Household Land in the Settlers' Home Area



A cooperatively worked field or pugo is cultivated by the entire family. The head of the household dictates what crops are to be cultivated on these parcels, the timing of the operations, and distribution of their production. The grain that is produced on the cooperatively worked fields is used to feed the household for most of the year. In addition, the household head controls any income from the sale of food or cash crops grown on these fields.

Each individual within a given household has the right to cultivate a certain amount of land for personal needs. For a woman this includes the right to at least one plot of a food grain, one or two plots of peanuts or groundpeas, and at least one vegetable patch. The unmarried children will usually plant one parcel of grain or a cash crop such as peanuts or cotton. Subhouseholds composed of married sons or brothers and their families will also farm a certain amount of food and cash crops separately. Any crop or income produced from a private field is under the control of the individual responsible for its cultivation.

In general the household head determines where the members of the family will be allowed to plant their private fields. The main exceptions to this are older wives or one of the male household head's father's wives who will usually retain a portion of their deceased husband's fields (he is usually a deceased brother or uncle) or a woman who has requested a land loan on her own (this is usually from a kinsman). An average of 33 percent of the total area planted in the settlers' home area in 1979 was cultivated as private fields; 64 percent of these private fields

were supervised by women (Figure 6).

Labor

Although cooperatively worked fields are given priority, certain hours of the day are set aside for the cultivation of private fields. This is usually an hour or two in the early morning before returning home. Occasionally a household head may designate one or two days that are to be devoted to the private fields entirely. The subdivision of household land is reflected in the subdivision of household labor with 33 percent of the total hours worked being on private and 67 percent on cooperative fields.

Since priority is usually given to cooperative fields, the private fields tend to be planted much later. This delayed planting increases the risk of an inadequate cycle of rainfall on the field. By the same token, private fields are given lower priority with regard to weeding and harvesting.

In many cases, the quality of the work is not the same on privately and cooperatively worked fields. This is especially the case for women who are often tired after a full day of work in the cooperative fields. When we verified our interviews with on-site visits, we often found that the two hours that a woman reported working would consist of her visiting her private fields, spending less than 30 minutes weeding, and the rest of the time picking leaves. We also observed that there were important differences between women in the same family in terms of the amount and quality of time they could devote to the cultivation

of their private plots. Factors influencing this were: (1) the position of the woman within the individual household; (2) relationship to her husband; (3) child-rearing responsibilities; (4) health; and (5) presence or absence of older sons who could assist the male household head in the fields.

In addition to their role as semi-autonomous producers of food crops, women play an important role in the cooperatively worked fields and in providing family food. Women provided an average of 50 percent of the hours worked on cooperative fields. Moreover, there was very little difference in the contribution of male and female workers to the performance of most operations except mechanical plowing and applications of fertilizer and pesticides.

Non-Labor Inputs

In addition to providing labor, a woman is responsible for providing the non-labor inputs for her private fields such as seed, manure, fertilizer, and, if she is planting cotton, pesticides. The grain seed usually comes from the previous year's harvest or is distributed by the woman's husband. In addition, it is quite common for both men and women farmers to receive "gift" seed from neighbors who had a successful crop the year before. The major cash expense for production is for the purchase of peanut and groundpea seeds. The harvest of these crops is usually eaten immediately since the seeds are difficult to store. In the rare case that a woman is cultivating cotton, she is obliged to pay cash for fertilizer and pesticides with income from non-crop production activities such as trade and the sale of

small livestock.

Income

An estimated 15 percent of the total area planted and 13 percent of the total production of sorghum and millet (the figure was as high as 27 percent of the area planted and 28 percent of production in the settlers' home village) was on women's fields. In addition, an average of 12 percent of the area planted in corn, 66 percent in peanuts and groundpeas, 16 percent in rice, and 58 percent in vegetables was on women's private fields.

Marketing

The food and cash crops that are produced on the private fields of unmarried sons and daughters tend to be sold at local markets. The cash income they derive from the sale is used for personal needs such as clothes, bicycle repairs, and petty trade.

Very little of the women's grain is sold. Rather, it tends to be used for supplementary food during the part of the year when the male household head may reduce food rations to one meal a day.

Expenditures

The cash income that a woman earns from the sale of her peanuts, groundpeas, sesame, cotton, and dried vegetables, is used to meet her needs and the needs of her children. These expenses include purchases of cloth, school supplies and school fees, as well as gifts to her friends and family, that cannot be or are

not satisfied by the male household head. In addition, it is the wife's responsibility to provide the basic condiments (oil, spices, meat or fish) for the daily sauces into which the sorghum porridge is dipped.

Related Non-crop Activities: Livestock

Under the best circumstances a woman will use the income from the sale of her privately produced crops to purchase livestock. In fact, very few of the village women in the study had sufficient income to do so on their own. Almost all purchases of small livestock were made with cash gifts from returning migrants or gifts that a woman received when she married.

2. Consideration of Private Production in the Design of the AVV Agricultural Program

There was little consideration of the economic and social role of private production in the design of the AVV agricultural program. Almost all agricultural extension (the selection and regulation of land, explanations about the use and purposes of new cultivation techniques, and credit programs to purchase improved inputs, were directed to the official male head of household (chef d'exploitation).

One reflection of this is in the assignment and training of extension agents. The male extension worker or encadreur functions as the main tie between the settlers and the administration. He is charged with informing the farmers about new agricultural techniques and insuring that the farmers practice them on the fields. An additional role is to assist the farmers in

gaining access to the AVV credit, veterinarian, warehouse and market services.

The female extension worker or animatrice focuses on the AVV programs to promote family health, nutrition, and handicrafts like weaving and knitting. An animatrice may also assist the encadreur in information sessions, food distributions, functional literacy courses, and bookkeeping. She does not receive any formal training in farming or consider her role as that of increasing female understanding and/or participation in the recommended agricultural program.

Although there was little consideration of private production, the project did recognize the important role of female labor. The amount of land that a settler received and the proportion of each field that he was authorized to plant, were supposed to be determined by the size and composition of his family labor force. This potential for labor is measured by a labor index that assigns weights to persons in the family according to sex and age. Since an adult male is considered to have a work capacity most readily transferred to a variety of tasks, this is the standard unit and is assigned a value of one. Women and children are assigned lesser values (0.75 for adult women, 0.5 for teenage boys, 0.25 for teenage girls). The smallest household authorized to have an official farm is Type Ia, one adult male (1.0) and one adult female (0.75).⁵

3. Changing Patterns of Household Production in the AVV

Land

By the end of the fifth year most households had reinstated a small area of private fields. Most of these private fields were small parcels of peanuts and in official cultivation bands; vegetable crops in the fields surrounding the concession; or small illegal plots outside the official cultivation bands.

Contrary to what I expected to find, the percentage of total area that is cultivated as private fields has remained relatively constant (12 percent for the Damesma settlers in 1979; 12 percent in 1983) (Table 3). Except for a 2 percent increase in the land cultivated by subhousehold units (married sons and brothers), there have not been any major changes in the distribution of these private rights. The settlers' wives cultivated about 6 percent of the total land planted in 1979 and 7 percent in 1983.

The more remarkable change in land area cultivated has been in crop patterns, notably an absolute and percentage decrease in the land area cultivated in cotton as well as an increase in the area of private fields planted in the higher priced grain crops which have lower cash costs and labor inputs. In 1979 only a small number of settlers cultivated private fields of sorghum; in 1983 almost all women cultivated at least one private sorghum field and most women cultivated more than one. Although the study shows a dramatic increase in the absolute area of sorghum cultivated by women, this does not necessarily mean that the percent of total area has increased since the men also show an increase in area cultivated.

Non-Labor Inputs

In contrast to the settlers' home village, it was not un-

Table 4

Subdivision of Household Land, Labor and Production

Type of Field	Land Area Cultivated		Recorded Labor Hours		Kg. Production Sorghum & Millet		CFA (\$) Value of Production	
	Home	Project	Home	Project	Home	Project	Home	Project
	1979	1983	1979	1979	1979	1983	1979	1983
N of sample Households	(35)	(26)	(35)	(9)	(35)	(26)	(35)	(26)
% on Cooperative Fields	67	89	67	92	72	92	75	92
% on Private Fields								
a. Male	12	3	15	1	15	4	10	5
b. female	21	8	18	7	13	4	15	3
Total	100%	100%	100%	100%	100%	100%	100%	100%

Methodology: Land figures are based on a breakdown of total area planted. The labor figures represent a weighted average over the aggregated labor data for each household in the sample. The 1979 production figures are based on recorded harvests; the 1983 figures based on the farmers' estimate of per field and per crop production for the year before. Total production figures are based on the CFA equivalent of production on all rain-fed fields.

common for an AVV woman to get assistance from her husband in the cultivation of a private field. This includes the male household head or an older son helping her to plow her fields and the household head providing her with small amounts of seed and fertilizer.

Labor

The project has also been associated with major changes in the internal organization of household labor. In the settlers' home village, an average of 41 percent of labor time was devoted to the cultivation of private fields. This compares with less than ten percent for the Damesma settlers in 1979. Figure 7 shows that this allocation of household labor reflected the distribution of private cultivation rights in the settlers' home village. Although women devoted a much smaller percentage of their labor to the cultivation of private fields, they were still responsible for 50 percent of the total hours worked on cooperative fields.

Agricultural Income

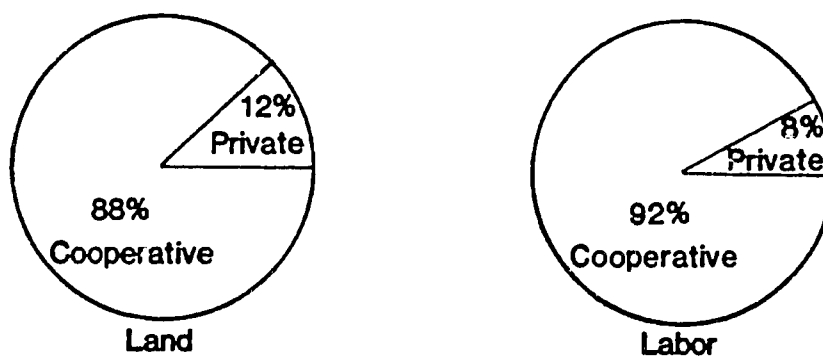
The decrease in private production is associated with a parallel decrease in the total kilogram production and CFA value of production that derives from private fields and fields supervised by women (Table 4). In 1983, four percent of the total production of sorghum and millet and three percent of the CFA value of production was from private fields supervised by women (Table 4). This compares with 13 percent of the production of

sorghum and millet and 10 percent of the CFA value of production in the settlers home area (Table 4).

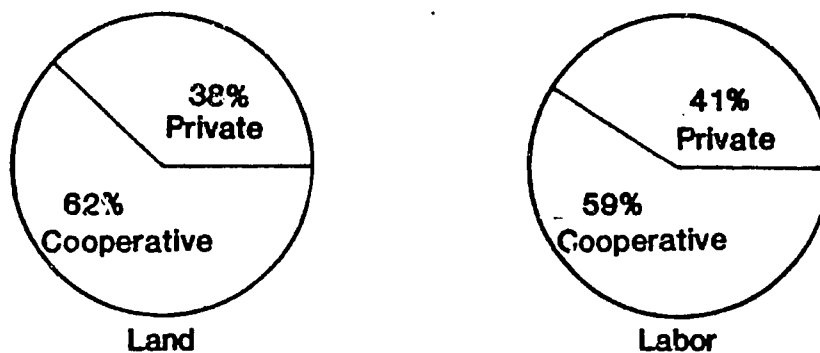
Figure 7

Allocation of Land and Labor to Private and Cooperative Fields

Damesma Settlers at AVV



Damesma Home Village



Income from Gifts

This decrease in women's independent crop production was associated with new sources of income. One of the most important was the much greater importance of harvest gifts and cash gifts to wives, and married and unmarried children after harvest. In 1979 the typical AVV wife received 15-20 gifts of corn ranging from five ears to an entire bushel from friends of her husband. This amounted to 50-100 kilograms or occasionally 200 kilograms of grain corn after husking. In addition, most AVV wives received cash gifts of 5,000-10,000 CFA after the sale of the cotton. Wives in smaller households and older wives received as much as 25,000 CFA. It was also quite common for the household head to make cash gifts to family members after the sale of a traction animal that had been looked after cooperatively.

Marketing

In contrast to the settlers' home area, almost none of the AVV women's grain was used for family food. Most of the grain was sold at or immediately after harvest. Due to the distance to local markets, the grain was usually sold in quantities of one to two tins (18-36 kilograms) by a woman's husband or child.

Additional income came from the sale of 35-50 kilograms of harvest gifts from other families in the village. This grain was sold to village merchants who would then sell it at the regional Mogtedo market. These marketing patterns are very different from the settlers' home village where the women had access to local markets and were able to sell their own crops.

Almost all the male household heads reported selling at

least three large sacks of grain, usually in single lots in the period after the first weeding when food prices are high due to grain shortages. By this time the farmers have a fairly good idea of what crop will be successful and are willing to assume the risk of selling their extra grain. These larger quantities of grain are transported to market in a cart.

What is more difficult to assess, if not impossible, is the total volume of grain sold in smaller quantities of one to two tins (17-36 kilograms). We estimate that the grain sold in this manner could easily value several hundred kilograms.

What the marketing study did not show was the significant increase in the amount of sorghum that was being exchanged through:

1. the settlers sponsoring new settlers who were not covered by the AVV food subsidy program; and
2. the direct exchange of sorghum for livestock.

By 1983 the AVV had changed its emphasis from long-distance immigration to working with settlers who were moving into the valleys on their own. As a result, almost all of the established settlers were involved in sponsoring, transporting or assisting new settlers. This assistance typically included: (1) a portion of the new settlers' family boarding with the established settler for all or part of the year while the rest of the family was clearing bush fields in an area where they hoped a new AVV village would be built, and (2) gifts of food to supplement the AVV rations once the new settlers were enrolled in the official AVV program. This latter type of food aid accounted for an estimated 30 to 50 percent of the 1982 harvests, sometimes

doubling the family's food needs.

Another use for grain was in exchange for livestock. The survey showed that a large number of farmers sold their traction animals the year before the study and used the money to pay off their remaining debts to the project. In most cases the replacement oxen were purchased from the local Fulani in exchange for grain. The cost of animals did not appear in any of the data on marketing but was discovered during the research on purchases and resale of livestock.

Expenditures

The project has also been associated with important shifts in expenditure patterns. This includes the male household head's taking responsibility for purchases of meat and condiments for the sauces as well as increased expenditures for women and children's clothing.

Related Non-crop Activities: Livestock

Between 1979 and 1983 there was a tremendous rise in livestock ownership. All the Damesma farmers had increased the size of their on-farm livestock from the two plow animals (the original animals were selected and financed by the AVV) to a minimum of four oxen and herds of 20-30 goats and sheep. This increase in purchased animals through cash purchases and the exchange of "surplus" grain is attributed to:

1. the settlers' preference for diversifying the household's production activities rather than increasing their investment of time and cash in agriculture in view of growing family size and a high degree of uncertainty

about the project's future;

2. the absence of alternative opportunities to invest the income earned from the sale of food and cash crops; and
3. the growing number of households with children that could be detached as full-time shepherds (This is again because of the increasing size and complexity of settler households. Young families where all of the children are in school or are under the age of ten are at a disadvantage.).

Although many of the farmers followed the traditional pattern of boarding the larger livestock with Fulani herders, there were a growing number who kept the animals in corrals next to the compound. This switch to on-farm livestock production seems to be related to their unwillingness to trust the local Fulani with whom they have no tradition of exchange relationships and the proximity of suitable grazing and watering spots in comparison with their home villages.

One of the more striking results of the re-study was the evidence for a dramatic increase in the incidence of animal ownership by women. This seems to be related to the women's desire for semi-autonomous sources of income but the lack of time and a recognized right for their private production of crops. It can also be attributed to the higher level of "disposable" income that most women have due to their increased sales of grain, sales of gift corn, cash gifts from the male household head, and the male household head taking responsibility for many of the expenses they had traditionally shouldered.

C. Conclusions

In conclusion, the AVV has brought about a number of important changes in agricultural production and income. These

include:

1. an increase in food production and cash income;
2. the transformation of traditional production practices toward greater cash cropping, higher cash expenses for production, more extensive cultivation practices, and greater use of animal traction;
3. an increase in the "surplus" production of food beyond subsistence needs which can be given as gifts or exchanged for livestock.

These changes in household income and production are in turn related to changing patterns of production and distribution within individual households. In the settlers' home area, women are responsible for about half the labor on the cooperatively worked grain fields that are the main source of family food. They also farm a certain area of land from which they alone derive the benefits. Although the private fields represent less than 25 percent of the average household production, that 25 percent is vital to the survival of the extended family. The grain that is produced on the fields provides supplementary food for the woman and her children during dry periods. The income from the sale of cash crops is used to purchase condiments for family meals and to satisfy personal needs such as gifts to her family, medicines, and clothes.

By 1979 (at this time the settlers had been living there from 3-5 years) this "semi-autonomous" role had reasserted itself in the form of: (1) reintroducing a small area of private fields that were generally planted in peanuts, rice, vegetables, and occasionally sorghum; (2) the male household head's making large cash gifts to family members after the sale of the cooperatively produced cotton; and (3) the reinstatement of a system of harvest

gifts whereby a woman could receive from 100-200 kg of grain (after threshing) from her husband's friends; and (4) the male household head assuming responsibility for many expenses which had traditionally been borne by the women.

The re-study showed an elaboration of these trends and the widespread introduction of private grain fields for women. This grain that was produced by the women in the AVV was not used for family food. Rather, almost all the women's grain, including the corn they received as harvests gifts, was sold at or immediately after harvest. If the income from the sale of privately produced crops and other income-earning activities they engage in is considered, the women have probably not experienced a serious drop in their absolute income. What is more significant is the drop in percent of total income of the family that is represented by these private income opportunities and their role in providing family food.

A second set of conclusions relates to the fact that the integration of women into both food production and marketing is neither fixed nor consistent over time, but related to a wide variety of changing variables. Some of the village and household-level factors include: population pressure, internal patterns of household organization (i.e. the presence or absence of sub-household units such as married sons, older and/or widowed wives and inherited wives from deceased brothers and uncles); labor demands on the cooperatively worked non-food crops, in this case cotton; per capita food production on cooperatively worked fields; and distance from local markets.

This integration of women into grain production may also vary over the life-cycle of an individual woman depending on her child-rearing responsibilities, the relationship of her older male children to the male household head; her relationship to the male household head (for example if she is a wife inherited at the death of an older brother or has been married to the male household head all along); level of education; physical health; the status of her family before marriage; and the presence or absence of local relatives from her own lineage.

It is important therefore for policy-makers to address the following:

1. How important are independent grain production, consumption, and marketing activities?
2. What is the role of independent and cooperative production activities for the internal organization of the household? For example, how does it affect the independent economic and social role of a woman vis-a-vis her husband or the ability of the farm family to incorporate married sons and their families?
3. How does the existence of overlapping production and consumption units and the differential integration of women into grain production and marketing affect our understanding of:
 - a. women's economic and social roles within the society?
 - b. the structure and organization of the typical farm household?
 - c. the farming system as a whole?
 - d. the factors which influence the willingness and ability of farm families to adopt new technology and participate in extension programs?

V. RECOMMENDATIONS

Specific recommendations for extension, evaluation and marketing research are listed below.

1. The Design of Evaluation Research and Farm Monitoring Programs. A comparison of the follow-up study with the baseline research on the settlers' home village has strongly reinforced the crucial need for longitudinal studies focusing on smaller data sets specifically to trace the effect of the project on traditional male and female roles, standards of living, cooperative and private production goals, and the distribution of production that is beyond subsistence needs. This is especially the case in planned settlement schemes where demands for labor and investment during the early years of the project are very high as are stress factors related to adjusting to new social and production environments.

This type of research will require a modification of traditional methods of survey and micro-level research. The more broadly based farm monitoring programs will need to build into their research design a data set that will be amenable to re-studies and to integration with special studies. In turn, the researcher who conducts the micro-level research will have to modify his or her methods so that the data is comparable to what is being gathered by the larger survey. Other suggestions include: (1) our scheduling more lengthy periods of research to include at least one full calendar year at less frequent intervals (five years, for example); and (2) restricting more short-term inquiries to less intensive and qualitative studies. This type of integration of micro- and macro-level research can

help policy makers to be more sensitive to the definition of key measurement and evaluation units such as "household" and to make a more accurate assessment of economic and social impact.

2. The Design of Grain Marketing Research. The integration of micro- and macro-level research can be equally important for studies of grain marketing and marketing decisions. The restudy of the AVV settlers shows that there is significant variation in the factors influencing the decisions of when, where, how much, and by what means to distribute "surplus" grain in different time periods for different members of the family.

3. The Design of Agricultural Policies to Benefit Women. The re-study has underlined the need to pay more attention to the factors which influence the ability and willingness of women to take advantage of new income-earning opportunities, extension programs, and improved technology. Not all women are created equal in terms of background, beauty or brains, nor can they be considered to be "equal" over their own life cycle. Child-rearing responsibilities, age, and position within the household have an important impact on the amount of time a woman has to devote to private and cooperative agricultural activities. They may also affect her production goals. Any project which fails to consider these very real differences in opportunities, background, and leadership ability in the design of policies and extension programs to benefit women is operating under a false assumption of "homogeneous" woman-kind.

VI POSTSCRIPT: LESSONS FROM THE EXPERIENCE

My return to Upper Volta under a SECID Technical Assistance grant was the second step in a longitudinal case study and has allowed me: (1) to observe the Damesma settlers in a period of time when they are undergoing rapid changes in production, consumption and investment patterns; (2) to establish a more complete baseline for examining long-term developments in the village through an expansion of the sample size from 10-26; and (3) to experiment with the design of short-term, single-shot economic surveys.

A. Logistical Problems

Some of the most pronounced logistical problems had to do with the extreme difficulty of training personnel to assist with data collection in a short period of time, and the difficulty, if not impossibility, of getting equipment, transportation and training. Neither of the SECID projects in Upper Volta was really able to provide this.

B. Quality of Data

Although I was working in a situation where I was known to most of the farmers and able to move in relatively easily, I am still rather dubious about the quality of some of the information that I gathered. This is especially the case with regard to the retrospective data on harvests.

Many of the farmers became frustrated when we asked for a precise recollection of how much they had produced on each field. This was less of a problem with the Muslim farmers who tradition-

ally count their harvests for the purpose of tithing.

While the data is far from precise, it is enough to look at changing patterns of production, in particular the growing importance of independent production activities for women. I fear, however, that the information is woefully inadequate for any substantive analysis of income.

C. Measurements of Changing Cultivation Patterns

I was surprised at the relative ease with which we were able to measure the fields with our new system of field measurement and with the high quality of information on livestock.

D. Directions for Future Research

The most valuable lessons from the summer relate to my changing opinion about the directions that anthropology should go in the study of economic change. It is absolutely essential that we build into our research a plan, but also a baseline data set, that will be amenable follow-up research.

If this type of research is to include any sort of quantitative data on production or income, the anthropologist will have to modify his or her methods. Some of the suggested means of accomplishing this would be:

1. our integration with some of the existing farm monitoring programs in a region; and
2. our scheduling more lengthy periods of research to include at least one full calendar year at less frequent intervals, say every ten years, and to restrict our more short-term inquiries to less intensive, qualitative research.

One word of Caution. While it is a very joyful and wonderful thing "to go home" --a very quick visit, with little time for letting people reacquaint themselves with you and you with them, can do more harm than good. There is also the danger of making hasty conclusions based on your long-term familiarity with the region.

APPENDIX ONE
QUESTIONNAIRES USED IN THE STUDY

Form 1
Field Survey

medical

FIGUE 05 CARACTERISTIQUES DE CHAMPS

DATE: _____

46

Menage: ASSH. m

No. Chp: 016

No. Parcel: 17

321

Responsable de Parcel: Rasmala

Relation CM: _____

Situation du Champ: jean Bah

Cultures sur le champ: 01 Sorgho
02 _____
03 _____
04 _____

CROQUIS

N

*1110 m²
11.16 (ha)*

COTE	LONGUEURS (m)	ANGLE (deg)	COTE	LONGUEUR (m)	ANGLE (deg)
1	35.49	123°	10		
2	25.45	140°	11		
3	27.63	113°	12		
4	37.20	33°	13		
5			14		
6			15		
7			16		
8			17		
9			18		

SUPERFICIE _____ ha. ERREUR DE DISTANCE _____ %

fiche
v concess a.inst act res act2 res2

3.3.3.3.

Edmond

Relevement Animal
TYPE ANIMAL

	Edmond	Jeanne	Anne	Marie
	RCC:	N:	RCC:	N:
CD	Q(4)	CFA(6)	Q(4)	CFA(6)

1. boeuf t.	"	"	"	"
2. boeuf a la maison	"	"	"	"
3. boeuf AV/ Paul	"	"	"	"
4. boeuf Paul	"	"	"	"
5. chevres	"	0001,2500	"	"
6. mouton	"	0.	"	"
7. poule	"	1'000300"	"	"
8. pintards	"	"	"	"
9. ane	"	"	"	"
10.	"	"	"	"

7 petites
pas bien classées

Relevement
BENS IMMOBILIERS

1. case ronde	"	"	"	"
2. case ameliore	"	"	"	"
3. maison toile	"	"	"	"
4. gr. gr. trad	"	"	"	"
5. dt. gr. trad	"	"	"	"
6. gr. gr. ad.	"	"	"	"
7. pt. gr. ad.	"	"	"	"
8. charette	"	"	"	"
9. moto	"	"	"	"
10. mobylette	"	"	"	"
11. bicyclette	"	"	"	"
12. radio	"	"	"	"
13. montre	"	"	"	"
14. tercho	"	"	"	"
15. bagues d'ore	"	"	"	"
16. charrau	"	"	"	"
17. piece charrau	"	"	"	"

FOOTNOTES

1. Onchocerciasis is a disease transmitted to humans by the female fly, Simuleum damnosum. The fly carries the larvae of a parasitic worm, Onchocera volvulus, which spreads into the epidermic tissues of the skin eventually reaching the anterior chamber of the eye. Clinical indication of the disease appears only after repeated bites from infected flies. Effects include skin discoloration, itching subcutaneous nodules, and in the later stages, eye lesions that may result in blindness. The Volta Basin of West Africa is one of the most endemic onchocerciasis areas in the world. A United Nations' survey in the early seventies estimated that nearly 700,000 square kilometers with a population of ten million were affected. Of this number, an estimated one million people were infected and 70,000-100,000 were either blind or suffering serious eye impairments. The OCP covers approximately 700,000 square kilometers of a seven country area including parts of Togo, Ghana, Benin, Ivory Coast, Niger, Mali, and Upper Volta. At the regional level the program includes spraying the infected river basins with a biodegradable organophosphate (abate) in order to bring the population density of the disease vector below a critical level.
2. SECID is a not-for-profit consortium of thirty-four academic and research institutions in seventeen southern and eastern states. The consortium provides technical assistance, training and procurement services to developing nations, using technical teams composed of faculty members from the thirty-four member institutions.
3. The specific goals of the technical assistance component include (SECID 1982: 4): (1) improving the marketing and distribution of grains for the purpose of providing food security especially to grain deficit areas and during the pre-harvest (hunger) season; (2) assisting OFNACER in its operational activities of buying and selling via an effective pricing and distribution system; (3) determining means of effectively integrating the private sector into the national grain marketing system to optimally utilize scarce resources, capital, and entrepreneurship; (4) assisting and advising OFNACER regarding the efficient functioning of supporting infrastructures such as transportation, communication, and storage to stimulate an orderly and economical expansion of grain distribution systems; (5) assisting and advising the Director of OFNACER in policy matters that will enhance the mobilization of savings via producer incentive policies, trade policies, monitoring and analyzing the effects of foreign exchange controls, and proper collection, analysis and utilization of data; and (6) supervising and training local employees in planning techniques and financial accounting procedures such that upon completion of the project OFNACER will possess indigenous personnel to carry out subsequent planning and accounting activities in a timely and effective way.

4. Figures are based on the 1975 Project Identification Report of the Dutch Government for the AVV which estimated a minimum food requirement of 2,230 calories per person per day. This is the equivalent of 140 kg cereals and 30 kg legumes per person per year including losses during storage (Murphy and Sprey 1980:22). Figures represent the difference between the recorded grain per resident and the recommended 240 kg minimum of cereals.

5. It is very easy to focus on the AVV labor index as a sign of systematic discrimination against women. To do so, however, can divert attention from issues related to the actual participation of women in the scheme. The labor index was, quite simply, a short-term means to control the allocation of river basin lands to small holders and to avoid the lands being colonized by absentee landlords using mechanical cultivation methods. For discussion about the use of weighted labour hours in the analysis of farm management data, see Collinson (1972: 200-202) and Delgado (1979: 87-100).

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