SENEGAL
NIGER
UPPER VOLTA

NEW ADAPTIVE SOCIAL MECHANISMS EVOLVING AMONG THREE SAHELIAN POPULATIONS AFFECTED BY THE DROUGHT

-- August, 1975-July, 1978 --

FINAL REPORT

Dr. Elliott P. Skinner
Principal Investigator

A study sponsored by the AFRICAN-AMERICAN SCHOLARS COUNCIL, INC. under contract with the Agency for International Development (Contract Number AFR-1162).

October 31, 1978

UNITED STATES GOVERNMENT

memorandum

DATE: December 14, 1978

REPLY TO ATTN OF: N. Rifkin/J. Owen: AFR/SFWA/SDPT

SUBJECT: Review of Afro-American Scholars Council Report

TO: A. Hoben: PPC/PDA
B. Johnson: AFR/DR/ARD
H. Hobgood: DS/RAD
J. Bingen: AFR/SFWA/SDPT
M. Seymour: DR/EHR

We would appreciate your joining us to review Dr. Elliott Skinner's final report, "New Adaptive Mechanisms evolving among three Sahelian Populations affected by the Drought". For this purpose we have reserved conference room # 6320 on December 20th from 2-4 p.m. .

To guide you in your review, we have attached the purpose of the report and its special objectives as described in our grant agreement with AASC.

We look forward to hearing your views on the report sections you have offered to examine,as well as your impressions of the report as a whole.

PROGRAM DESCRIPTION

A. Purpose of Grant

The purpose of this Grant is to provide support for a project, under which the Grantee will identify and study new adaptive social mechanisms evolving among Sahelian populations affected by the drought and to suggest viable ways for support by A.I.D. and other donors.

B. Special Objectives

To conduct a study of new adaptive social mechanisms evolving among Sahelian populations affected by the drought. Three Sahelian countries are involved: Senegal, Upper Volta and Niger. Within these countries the three types of groups identified for investigation are as follows:

1. Pastoral and agricultural groups in camps.

2. Agriculturists remaining in villages.

3. Pastoral groups trying to exploit traditional pastures.

Anticipated results of the study are as follows:

1. increased knowledge about the nature of assistance required and desired by the three representative groups which should be replicable;

2. use of indigenous strengths and skills in rehabilitation and development programs thus enhancing prospects of success;

3. reducing tensions brought about by necessity of change through linkage of old ways with the modern;

4. guidelines for development efforts originating with the people who are being assisted; and

5. increased skills of American and African officials in dealing with these and other population groups.

C. Implementation

1. General

The Grantee will appoint a Project Director who will form four study teams, consisting of two persons per team. Each team will be composed of one American and one Host-country national. Two teams will be assigned to Senegal and one each to Upper Volta and Niger. The teams activities will include the following:

a. Carry out preliminary research in the U.S. prior to arrival at the field sites;

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-- ACKNOWLEDGEMENTS --

The African American Scholars Council gratefully acknowledges the field research conducted in Senegal, by Ms. Theresa A. Ware and Mr. Abraham Waldstein; in Upper Volta by Ms. Grace Hemmings; and in Niger by Mr. John Sutter.

Special thanks are expressed to the governments of Senegal, Upper Volta, and Niger for so receptively welcoming the four American researchers.

It would be a monumental task to thank all of the African government officials at the national, regional and local levels, who facilitated the project tasks and activities. The Council is, however, particularly indebted to the following individuals who, through their respective institutions, served as field hosts and advisors; as well as provided resource support. Their cooperation and commitment were indispensable to the effective implementation of this project:

Monsieur Tidiane Aw, Director
Société de Développement et de
Vulgarisation Agricole (SODEVA)
Dakar, Sénégal

Monsieur Cheikh Cissoko, Director
Société d'Amanagement et d'Exploitation des Terres du Delta (SAED)
St. Louis, Sénégal

Monsieur Papa Cyr Diagne, Deputy
Director, SAED, St. Louis, Sénégal

Monsieur M. Y. Diawara, African
Counterpart, Upper Volta

Monsieur M. Issaka Doulaye,
African Counterpart, Niger

Monsieur Alioune Kane, Regional
Director, SODEVA,
Diourbel, Sénégal

Monsieur Papa Kane, Director
École National Economie Applique
Dakar, Sénégal

Monsieur Michel Keita, Deputy
Director, Institut de Recherches
Scientifique (CVRS)
Niamey, Niger

Monsieur Marcel Poussi Ouedraogo,
Director Centre Voltaique de la
Récherches Scientifique (CVRS)
Ouagadougou, Upper Volta

Monsieur Mamadou Sow, African
Counterpart, Delta region,
Sénégal

Monsieur Thierno Sow, African
Counterpart, Diourbel, Sénégal

Finally, the Council expresses deepest appreciation to the farmers and herders of Senegal, Niger and Upper Volta who shared, so willingly, their time, thoughts, ideas and hopes for a better tomorrow with the research teams. Without their interest and cooperation, the project would not have come to fruition.

TRANSMITTAL MEMORANDUM

TO: Mr. James Kelly, Director
Sahel Francophone West Africa Office
Agency for International Development

FROM: Elliott P. Skinner, Principal Investigator
AASC Sahel Project

SUBJECT: Transmittal of Final Report
(Contract No. AID/afr-G-1162)

DATE: November 10, 1978

Enclosed herewith is the Final Report, New Adaptive Social Mechanisms Evolving Among Three Sahelian Populations Affected by the Drought; a study contracted by the Agency for International Development with the African American Scholars Council, Inc. This report represents a culmination of three years of research activities, on the part of four American field researchers and their African counterparts. The field research was conducted in three of the Sahel countries, beginning in August 1975, for the two teams in Senegal; in February 1976, for the team in Upper Volta; and in September 1976, for the team in Niger.

The field research was an attempt to provide a data base concerning the emergence of adaptive strategies and new production behavior under the condition of drought. It was felt that if donor agencies and institutions, involved in development planning and programming, were alerted to adaptive mechanisms and new production behavior initiated by farmers and herders, the former would be better able to provide support for these emerging strategies, in the form of appropriate technical and financial assistance.

Appended to this report, are the interim reports from the field sites.

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Cable Address: AFSCO, Washington, D.C.

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CHAPTER ONE

INTRODUCTION

Background of the Study

The African-American Scholars Council, under contract with the Agency for International Development, sponsored, from August 1975 to August 1978, field research on adaptive strategies evolving among three Sahelian populations affected by the drought of 1966-1973.

This research was conducted in Senegal, Niger, and Upper Volta. Portions of each country were severely affected by the drought.

The Sahel and Drought

Sahel, an Arabic word meaning "plain", refers to the arable and grazing land bordering the Sahara Desert. Ecologically, it can be defined as the zone of semi-arid lands extending approximately 2600 miles eastward from the Atlantic Coast between latitudes of 10 and 20 degrees north. Although this zone extends from the Atlantic Coast to the Red Sea, Sahel generally refers to six West African countries. These countries are Chad, Mali, Mauritania, Niger, Senegal, and Upper Volta.

Drought is not a new phenomenon in the Sahel. Historical records report cyclical droughts and food shortages of varying lengths since the seventeenth century for many parts of the Sahel.

Drought here is defined as a situation of abnormally low rainfall or below average rainfall over a protracted period of time. The Sahel zone has a mean annual rainfall between 200 and 600 mm. The primary characteristic of the climate is the shift between a dry and rainy season. Between the latitudes of 10 and 20 degrees north, most of the rainfall occurs between May and the end of September. During the dry season, between October and May, rainfall is nil.

Beginning about 1966, local meteorologists noted a net decrease of rainfall in an area which normally received between 100 and 400 mm primarily between May or June and September or October.

By 1970, the Sahel had experienced increased diminution of rainfall. By 1972 the problem of decreased rainfall had severely threatened the lives of man, animal, and plant. The water table throughout the Sahel region had dropped by approximately one hundred feet. The Senegal River, which normally crested at twenty-six feet during the height of the rainy season, crested at eighteen feet. Lake Chad, whose fluctuations generally serve as an indicator of the amount of precipitation in the region, dried to one-third its normal size. In 1972, Lake Chad contained 12,000 million cubic meters. In 1970, the lake contained 31,000 million cubic meters.

This dramatic decrease in annual rainfall had a disastrous effect on the environment, man, and his animals and plants. This disastrous effect has been measured in terms of loss of crops, livestock, and lives. Senegal, for example, which normally has annual average rainfall of around 300 mm had only between 60 and 120 mm. This resulted in a one-third decrease in harvest tonnage for peanuts and cereals in 1970, and a fifty-five percent decrease in 1973. Livestock herds were reduced by between twenty and forty percent.

The Problem

The problem faced by Sahelian populations was how they would survive the drought. This problem became one of priority by 1970. Food shortages became more pronounced and extensive than the annual "hungry season" which extends from March-April to September-October.

The Need for the Research

The need for the research was based on the fact that a communications network was needed to disseminate information on drought-related problem solving and decision making by farmers, herders, urban populations, and the governments. In Senegal and Upper Volta, a national rural development strategy, designed to raise the level of productivity and the general welfare of farmers and herders was in place before the drought. In varying degrees, farmers and herders had participated in the national strategy, but the drought altered attitudes and behavior toward these strategies.

What, exactly, were farmers and herders doing to survive the drought? Was government response to drought recovery and rehabilitation a reflection of the production behavior and new strategies of farmers and herders? What was the role of donor participation in drought relief, recovery, and rehabilitation?

For many populations affected by the drought there was no baseline socio-economic data on who they were; how they produced and consumed; and how they perceived their needs in a drought stiuation. A serious information gap existed in many instances for those charged with the responsibility of communicating official strategies of adaption to drought.

There was information concerning the measurements of drought affectation such as crop and livestock loss, human loss of life, shrinking income, and chronic food shortages. There was also information on the drought relief effort mounted to ameliorate the stressful situations. There was not, however, very much information on the manner in which farmers and herders were adapting to the situation: how they were modifying their production behavior and how they perceived their situation. The process by which they created new mechanisms for survival was not always the focus of some of the data collecting and reporting effort set in motion by international awareness of and responses to drought relief and recovery.

The field research effort in Niger, Senegal, and Upper Volta was an attempt to address the need for detailed baseline socio-economic and cultural data on farming and herding populations affected by the drought.

A basic postualtion was that drought recovery and rehabilitation programs and projects could benefit from the data if emerging adaptive strategies could be identified, analyzed, and presented within a comparative framework. It was felt that if donor agents and institutions involved in development programming and planning were alerted to adaptive mechanisms and new production behavior initiated by farmers and herders, the former would be better able to provide support for these adaptive mechanisms in the form of appropriate technical and financial assistance.

Audiences of the Study

From the initial conception of this field research project, the 'use-focus' of the research had two key audiences in mind: the Agency of International Development and the African governments, particularly those of the Sahel and host countries.

One of the major concerns of the Agency for International Development is set forth in the purposes outlined in the Foreign Assistance Program guidelines found in the AID Handbook 3 and restated here:

"Assistance to less developed countries in strengthening their indigenous capacities to function more effectively in aiding those groups who constitute the poorest majority to increase their diets, provide better health and child care, and increase their incomes."

The African-American Scholars Council was interested in contributing to the realization of this goal concern. It was felt that field research in parts of the Sahel could be of value to those charged with the responsibility for designing, implementing, and evaluating programs and projects. It was further felt that for the research to be useful to AID and Sahel government officials, the focus and emphasis had to be on the process of change - the process by which behavioral modification of the traditional way of producing and interacting socially were the adaptive strategies which heralded change.

Drought was the background against which these adaptive strategies would be identified and examined. Adaptive strategies to drought were the pivotal research issue.

Statement of the Hypothesis

The basic hypothesis of the research conducted was that farming and herding populations in the drought-stricken areas of Niger, Senegal, and Upper Volta adapted to and survived the highly stressful situation of drought by devising innovative strategies. The drought caused changes, not only in the physical environment, but in many economic and social habits of farmers and herders; thus forcing them to modify their traditional mechanisms for survival.

Methodology

The methodology of the field research was based on a team effort. There were four teams of two people each; the American field researcher and the African counterpart. Each team worked under the aegis of an in-country Ministry at the national level and its administrative representative at the local level.

There were two teams in Senegal, one in Niger, and one in Upper Volta. Each team developed its own information and reporting system with the particular institution under which it conducted research. At the end of a specified period of time, tentative findings and recommendations were reported to the AID mission in the country and to the Sahel office of AID in Washington.

This document, accompanied by its Appendix of eight interim reports constitutes the African-American Scholars Council's final report under the contract.

A public conference was held in Dakar, Senegal in January 1977. The primary purpose of this conference was to strengthen the collaborative methodological approach. Secondly, the conference provided the opportunity for the dissemination of preliminary findings and recommendations based on field research.

The conference was hosted by the AID mission in Dakar and convened by Ambassador Rudolph Aggrey. Dr. Edward Hirabayashi headed a delegation from AID, Washington, D.C. Mr. John Hoskins represented the AID mission in Ouagadougou. Participation of African institutions indluded the Centre de Recherches en Sciences Humaine (CNRSH), in Niamey, Niger; Societe d'Amanagement et d'Exploitation des Terres du Delta (SAED); St. Louis, Senegal; Ecole Nationale d'Economique Applique (ENEA); Dakar, Senegal; Societe de Developpement et de Vulgarisation Agricole (SODEVA), Dakar, Senegal; and the Centre Voltaique de la Recherche Scientifique (CVRS), Ouagadougou, Upper Volta.

A second public conference was held October 27-28, 1978 in Washington, D.C. This conference was the culminating activity of the three year field research project.

One of the primary purposes of the October conference was the dissemination of the findings and recommendations based on the field research completed as of August 1978. Another purpose of the conference was to serve as a forum for the exchange of ideas and information among development researchers, planners, and administrators, not only on issues of Sahel recovery and development, but also on issues relevant to development needs in other parts of Africa.

The African-American Scholars Council Research Approach

The African-American Scholars Council views development research as a process of communication between: (1) the perceptions, experiences, and needs of populations targeted for more effective participation in the processes of development; and (2) the information needs of AID as well as other donor institutions.

The information needs of AID concerning Sahelian populations is the part of the research process to which the Council addresses itself in this study. It is our understanding that the process of communication between donor and recipient is important to AID in achieving its program goals.

It is hoped that this study is an informed and informative examination of the ways in which farmers and herders adapted to the drought. This is important information, but it is further hoped that this information will be of use and value to AID in its planning for Sahel program identification.

CHAPTER TWO

SUMMARY OF FINDINGS AND RECOMMENDATIONS

SECTION I. SENEGAL: THE DIOURBEL REGION

A. Wolof Farmers

Among Wolof farmers in the Diourbel region, major innovative strategies were as follows:

(1) "embouche bovine" or livestock fattening as a commercial investment and hedge against lean times, rather than as a source of food;

(2) increased permanent abandonment of farming by younger males of a compound family in search of full-time non-farm employment in the towns and cities;

(3) village-wide seasonal (dry-season) exodus to the commercial center of Touba in search of a secure source of water and non-farm employment;

(4) farily widespread consumption of peanut seeds; and

(5) widespread selling and pawning of farm tools and equipment.

B. Fulani Herders

Innovative strategies among Fulani herders in the Diourbel region were of a more dramatic nature than those found among Wolof farmers in the same region. The major ones were as follows:

(1) movement into peanut farming for the first time;

(2) increased movement into cross-ethnic occupational activities, such as gum tree exploitation;

(3) increased commercialization of milk by Fulani women who transhumed with their husbands;

(4) increased desire for commercialization of milk through non-traditional distribution channels, and

(5) participation in the agricultural system as advisors and assistants in the traction animal program of SODEVA.

-A-

"Embouche Bovine"/Livestock Fattening

Livestock fattening began during the drought when a number of farmers in the district started buying livestock and fattening them for resale at a profit.

The rural development agency responsible for providing extension services in the peanut zones of Senegal, SODEVA, encouraged this activity and initiated the channeling of this activity towards a more development oriented end, by incorporating it into the national rural development strategy.

Cattle fattening for profit was an innovation in the district which was diffused from the Serer Sine Saloum region which spread to the district in 1969. By this time, Fulani herdsmen who transhumed in and through the district were desparately selling emaciated cattle, sheep, and goats. There were instances in which an emaciated bull sold for $30.00, a milk cow for $20.00, and a heifer for $10.00. Enterprising small farmers were buying these animals and fattening them up for sale, at a profit, to itinerant cattle buyers who in turn were selling them to slaughter houses or small butcher shops. How did the government view this activity in terms of its own goals? SODEVA recognized, in this innovation, the possibility for its inclusion in its draft oxen program which was part of the national development strategy. The national development bank was requested to underwrite seed money for SODEVA's idea to incorporate this farmer-initiated innovation into the national strategy. Farmers recommended to SODEVA's regional office by rural extension workers, were approached and asked if they would be interested in purchasing livestock with money from SODEVA, and fattening these animals on food paid for by SODEVA. At the end of the three month fattening period, the farmer would sell the animal or animals at enough of a profit to repay the initial investment by SODEVA and clear a profit for himself.

This was taking place during the drought period when the farmer's economic situation was in continuous decline. Unfortunately for the draft oxen program, many small farmers would buy the cattle and resell them before they were fat enough to bring a profit. Then the money gained from the sale was used for domestic needs. This meant that SODEVA got no return on its seed money investment. Finally, the national development bank ceased to underwrite the program and this innovation did not survive in that form.

The potential of this innovation lies in its possibility to provide the small farmer with almost immediate benefits in terms of income. Three months is not a very

long time to postpone an income-generating benefit. It is an innovation which needs strengthening in terms of financial support.

Livestock fattening in the district, which was an innovation initiated by small farmers themselves, was integrated into the national strategy as a variation which represented an improvement along the line of an established trend. But, was it really an established trend firmly integrated into the agricultural system?

It seemed not, at that time, because the small farmer initiated this strategy as a source of quick money and as a hedge against hard times, as he perceived that drought could be a very long and/or recurring hazard to his primary production systems.

The crisis situation of the small farmer did not permit the luxury of delayed benefits within the context of a national long-range rural development strategy. The farmer could not wait two or three years to reap the benefits of the improvement of draft oxen over the horse and donkey as work animals in the fields. How, then, could this innovation have, at that time, been optimally incorporated into the national strategy?

Technical Assistance and Women in the Development Process

The development and implementation of a small livestock -- sheep and goats -- and poultry husbandry program, managed by farm women with the aid of appropriate technical assistance, could be a beginning attempt to strengthen the innovation begun during the drought and incorporate it into the national development strategy.

While men have full responsibility for the care and feeding of cattle, women assume responsibility for sheep, goats, and poultry. The proper care and feeding of these animals could have an inpact on an intensified crop production program, if for no other reason than the production of organic fertilizer for the fields. The sale of eggs and even of chickens would generate income and quick liquid cash for small domestic and personal needs.

In 1976-77, the approximate total of domestic animals in one village was 65 sheep, 25 goats, 20 cattle, 22 horses, 9 donkeys, and 85 chickens. While this small holding of domestic animals cannot begin to provide adequate organic fertilizer for the hectares under cultivation, a consistent

and diligent beginning in strengthening this resource use could have some positive results in terms of attitude concerning the use of organic fertilizer. The problem of transport to the fields could be resolved by marshaling a joint effort in the utilization of existing carts in the village. This should pose no problem since many of the farmers are already engaged in a mutual cooperative effort when they borrow, for example, a neighbor's horse and loan that neighbor their seeder. Some compounds that had only one or two sheep and goats before 1973, now have two or three; and stated that, whenever possible, they intend to purchase more because these animals can provide an amount of added financial security if the need for cash becomes an immediately pressing problem.

The possibilities for poultry raising as a variation within the framework of the livestock fattening innovation had a precedent in one of the research villages. This seems to indicate an increase in its chances for success and ability to sustain and replicate itself without large external inputs.

Beginning in 1964, there was a poultry house in the village and approximately three hundred eggs were sold per year. During that period, the chickens were fed millet, millet husks, and feed bought from a local merchant. This poultry house belonged to the women of the village and was initiated by the wife of the village chief who involved the other women in this enterprise. Each woman was asked to contribute 150 CFA francs for the maintenance of this activity. According to the wife of the village chief, each woman who participated in this activity was proud of her contribution to a profitable undertaking. Each woman had the right to sell the eggs of chickens she contributed and to take some of the small chicks to her compound to start her own poultry raising activity. The women took turns cleaning the poultry house every day and feeding and watering the chickens. Access to a market for the eggs and chickens was no problem since the village is only eight kilometers from the commercial center, and is located on the main route which provided an additional clientele in the form of travelers.

Unfortunately, the poultry activity came to a halt because the chickens began to die each year between December and January, from an illness which the villagers were not able to isolate. This diminished the poultry stock to the point of abandonment of the activity by the women. The wife of the village chief and several other women in the village stated that the women would like to start this activity again, because they felt that it was important to have something to fall back on when the crops fail, but they were concerned about

the illness which attacks the chickens in December. A SODEVA official informed me that SODEVA was interested in supporting poultry raising activities by providing the technical assistance and advice needed concerning the proper care and feeding of poultry. This was already being done in one other village in the district.

The farmer-initiated economic activity of investing in poorly nourished livestock, especially goats and chickens, for the purpose of fattening and eventually selling is an activity which could have a positive impact on the rural development strategy, as long as external and expensive inputs which cannot be easily replicated by farmers are kept to a minimum.

Increased Permanent Abandonment of Farming by Younger Males Village-Wide Seasonal (Dry-Season) Exodus to the Commercial Center of Touba

Farmers know that the lean season will begin in March or April and last through the millet harvest in October. It is this period when they have neither money nor millet reserves and must figure out ways of making ends meet. Some operate small consumer shops year round as a buffer between their families and extreme hunger. The majority of the compounds have younger members who begin the seasonal search for work in neighboring towns and the cities. Compound members who engaged in income-generating activities tended to be the younger unmarried males from 17 years up. The most prevalent dry season occupation tended to be petty trade and daily wage labor.

For the small farmer, dry-season activities away from the village are essential to survival from one harvest to the next. During the drought, a majority of the research compounds experienced the permanent loss of a younger adult male to the commercial centers, towns and cities. These young males were forced to seek work as wage laborers, not just during the dry season, but during the entire year. They left their families in the villages and moved in with relatives or friends in commercial centers.

Whether they found work or not was of extreme importance to each of them, but from a national development point of view, compound families lost adult manpower needed for agricultural tasks. Also of importance was the fact that the commercial centers, towns, and cities, could not support, in terms of employment opportunities, increasing numbers of adult males who were abandoning the farm as a primary source of livelihood.

One of the research villages provided an example of village-wide seasonal (dry-season) exodus to the commercial center of Touba. This village had one functioning well of at least forty meters and one artificial or seasonal pond. The water table in both is dependent on the rains. During the rainy season, drinking water for the population and for their animals comes from the well and from the pond. By the end of October the pond is dry, and the water table in the well has descended to a point which makes drawing water a very difficult task for the women.

During the drought, the problem of the perennial water shortage was exacerbated to the point that villagers responded in their own fashion to securing a more certain access to water on a year-round basis.

The problem of the lack of water in the village, from November to July, created an interesting pattern of village-wide seasonal migration from the village to Touba during this period. Ninety-five percent of the compound heads have some type of dwelling at Touba during the dry season. This dry season exodus gave the village a kind of seasonal migratory status.

Most farmers return as late as possible to clean and prepare their fields. Rural extension workers often stated that preparation of the fields is a hurried and haphazard affair, thus making extension counseling and education services almost impossible. This particular innovation by farm families clashed head-on with the rural development strategy in operation SODEVA, since this absence of farmers from the land which they farmed -- except when they were actually farming -- created a problem for the dissemination of technical and educational information.

Farmers did not seem to perceive any benefit accruing to them from the curtailment or abandonment of their dry-season activities, for the purpose of locking themselves into what amounts to year-round attention and commitment to farming activities and tasks. In many ways, the attitude of the small farmer was that increased production yields were not guaranteed, even if one spent the entire year engaged in strictly agricultural activities. Thus, dry season activities can be expected to continue.

The most crucial issue for the farmer and the government, is to find the most effective way in which the farmer's time and those activities engaged in during the dry season can be harnessed to the ongoing rural development strategy. This

means, finding a short-term income-generating activity which would provide almost immediate benefits to the farner at the same time the national rural strategy is strengthened.

Young adult males were leaving the farm in increasing numbers during the drought on a permanent basis. Compound families in the research village were away from the farm, except during the planting and harvesting period. The reason for this movement was clear; they felt they had a better chance of survival away from the farm, than they did if they remained during the dry season.

The most important way of keeping farmers on the farm would be to present an income-generating strategy, in which the farmer could reap almost immediate benefits. This is where the farmer-initiated innovative strategy of "embouche bovine" takes on dramatic significance.

If strengthened financially, the "embouche bovine" innovation has the potential for providing within a three month period of time, income from the profit made on the sale of fattened animals. This type of activity does not require the kind of mobility and displacement that the search for dry season income-generating activities demands at the moment.

Fairly Widespread Consumption of Peanut Seeds

During the drought, farmers in the region consumed increasing amounts of peanut seeds as their food sources dwindled. This did present a problem in terms of the amount of acreage under peanut cultivation, but was only one of the reasons why peanut cultivation was cut back.

Farmers were required to pay back to the agency responsible for the distribution of the annual seed stock (for planting), 25 percent interest in kind. During the drought years, farmers either completely or almonst completely lost their crops due to lack of adequate rainfall. Whatever they harvested was either eaten or sold.

Whether the peanuts were eaten or sold was not the ultimate issue. The ultimate issue was that the farmer was almost totally dependent on the peanut for survival. His annual income depended on the peanut harvest. Paying his debts depended on the peanut harvest. The farmer was tied to the peanut economy. Peanut culitvation is a rain-fed agricultural system. If there are no rains or if rains are inadequate, the farmer stands to lose everything. If he manages to salvage some of the peanut harvest, but has a food shortage in his

compound, the seeds will be eaten. Being forced to eat his source of income for the next year during a situation of crisis, points to the dependency of the farmer on the peanut for survival.

One way in which the dependency of the farmer on the peanut for survival could be lessened would be through a type of diversification of production and income-generating activities. An "embouche bovine" activity on a fairly widespread regional basis could become profitable enough for the farmer to reduce his dependency on peanut cultivation.

Widespread Selling or Pawning of Farm Tools and Equipment

Another problem in realizing much progress in the agricultural systems, especially the peanut production system was the widespread selling and pawning of farm tools and equipment. At the beginning of each planting season, many farmers had sold or pawned their tools, especially their seeders, for needed cash to meet some pressing household expense.

This lack of adequate tools with which to begin the cultivation season contributed to the poor yields. Even with the best of extension counseling, a farmer cannot farm very effectively, if he does not have the necessary tools. These tools were viewed by small farmers as commodity items easily transformed into cash. They were not always viewed as investment items in the agricultural system. As commodity items easily transformed into cash, these tools and equipment brought enough cash to regulate or solve a small domestic or personal problem.

The need seemed to be for ready cash in practically all households. Again, the data suggests that an "embouche bovine" activity would be an effective vehicle through which the farmer could gain access to cash, by engaging in an activity which would feed directly into the rural national strategy; and at the same time, it would allow the farmer to accrue a short-term benefit by participating.

-B-

Fulani Herders

The most conspicuous new subsistence behavior among the Fulani herders in the Diourbel region was the entry into the cash crop economy of peanut farming. With the exception of one compound head who confided his share of his father's inheritance to his younger brother, upon the father's death

many years ago, so that he could pursue his interests in livestock trading and farming. Cash crop farming came to the zone between 1966 and 1973, which was the period of the drought. Herd managers, who transhume, were unable to, and more importantly uninterested in participating in growing peanuts, or millet for that matter; but did assign an older son the responsibility of clearing a plot and planting the seeds.

The same farm tools used for millet cultivation were used for peanut cultivation and just as with millet, the norm was no more than 1 hectare of peanuts. Yields were also poor, ranging, in 1975, from 312 kilos to 1 ton for 1 hectare planted and from 800 kilos to 2½ tons for 2 hectares planted. Some of the men growing peanuts during the time this research was conducted had never used farm tools before in their lives. Millet farming was never seriously viewed as farming. It was engaged in to supplement the diet rather than as a staple food or income-generating activity. Peanut farming was viewed as an economic occupation engaged in for the purpose of hedging against the sale of animals from drought-diminished herds. Small livestock had always been sold to take care of small domestic and personal expenses. It was hoped by the herders that their peanut harvests would now provide them the needed cash for expenditures relating to the household. The theme repeated throughout the zone concerning peanut farming, was that it was resorted to out of sheer proverty. The disdain for farming was repeated often.

Entry into the cash crop enconomy seemed, on the surface, to have drawn the Fulani within the orbit of the agricultural development strategy since they had to interact, however superficially, with the development agencies already on the ground.

In 1976, it was clear from the data that these Fulani were not knowledgeable about peanut farming. A good index of this was the low millet and peanut yields. It was true that a genuine lack of interest in farming partially accounted for low productivity, but haphazard and late planting, as well as negligent weeding practices, insects, and rates took a toll on crop yields. During the rainy season of 1976, no rural extension worker representing agricultural agencies paid a visit to the zone.

Increased Movement into Cross-Ethnic Occupations

Permanent flight or migration out of the residential zone was not seriously considered by any household heads

interviewed. Having decided that flight was not the best response to survival during the drought, innovations which meant crossing ethnic occupational boundaries were engaged in as adaptive mechanisms to the drought.

Petty trade in livestock, poultry, gum, amulets and traditional medicines, as well as dead wood were not new economic activities. They simply had not been engaged in by the Fulani on any recognizable and significant scale.

These Fulani, for instance, considered the exploitation of gum trees and the sale of the gum to be an economic occupation of Maures. Informants pointed out that they had long observed Maures and Wolof tapping the trees in the woods of the residential zone, but would never have considered this a job for the Fulani.

Poultry selling and the selling of dead wood were vie viewed as very degrading economic activities.

What was significant about this phenomenon of movement into occupations generally associated with other ethnic groups, was the fact that the Fulani herder was willing to be quite flexible, in an attempt to keep the remainder of his drought-diminished herd in tact, by moving outside his value system. When he talked about who he was and what his cultural identity was all about, he talked of cattle and the fact that he was the descendant of a herder. His cultural identity, his value system, and his production behavior are normally intertwined. Under the stress of drought, the Fulani herder exhibited production behavior which reached across ethnic lines. He never considered this behavior to be permanent. Whether the behavior was permanent or not, is not the point to be made here. The point to be made here is that the Fulani herder was capable of participating in economic activities over the short-haul which brought some immediate benefits. These activities were not always related to livestock, but viewed by the Fulani herder as the means by which he would reconstitute his herd and return full-time to his traditional occupation as a herder.

It is for this reason that the researcher feels that the new production behavior of participation in the peanut economy should be strengthened. The Fulani herder seemed willing to participate in any activity which would generate cash -- cash which he would use to pay for personal and domestic expenses -- without having to sell from his drought-diminished herd.

Increased Commercialization of Milk by Fulani Women

Milk is the beverage which symbolizes welcome, hospitality, camraderie, trust, and all that is traditionally Fulani. It is offered to strangers and kin alike as a way of saying welcome. It permeates every facet of Fulani life and is an endless topic of conversation among men and women. It represents a great deal of what is intangible and not be displayed in a commercial fashion. It means domesticity and is the property of a man's wife or wives.

Milk among these Fulani was exchanged for millet. During the drought, millet became increasingly scarce in the region. The need for cash became increasingly important. Fulani women who transhumed with their husbands, moved out of a milk/millet exchange system into a system in which milk was sold in market towns and villages near transhumance camps, during the dry season transhumance cycle. The milk was sold for 100 CFA francs per liter during 1976.

Many household heads, especially the older ones, expressed dismay that their women were actively participating in the commercial market, instead of the barter market.

During the dry-season, the women had less of a problem with market access, than they did during the rainy season. During the dry season, they were in or near market towns. During the rainy season, they were back in their residential zone which was a zone of almost all Fulani herders. This meant saturated markets.

The increased interest in commercializing their milk, led many Fulani herders to articulate their desire for commercialization of their milk through non-traditional distribution channels.

What was important here was not the emergency of an actual strategy, but of an attitude toward their surplus milk. It is the idea which should be supported and tried on a small pilot basis.

Increased Commercialization of Milk Through Non-Traditional Distribution Channels

The abundance of milk is a reflection of the wealth in cattle and redistribution is a socio-economic way of disposing of surplus. Exchange was another traditional way of handling surplus. For the Fulani herder who must leave the

agricultural zones by the eve of the first rains, in order not to run the risk of damage to Wolof fields, ready markets for his milk are closed off to him. The most abundant milk-producing period for the milk cows is during the rainy season when, unfortunately the herds are far from the ready markets in the agricultural zones.

Once returned to their residential zone during the rainy season and when the milk cows are most productive, the surplus -- not redistributed, sold, or consumed -- was unprofitably disposed of. It was poured in seasonal ponds, fed to dogs and horses, and dried into cakes for animal feed.

The problem was clearly one of a disequilibrium between supply and demand.

The data indicates that the emerging idea of a new type of commercialization of milk surplus through non-traditional channels should be supported.

This could be initiated by the introduction of dairy techniques in the treatment of milk by the Fulani herders themselves, with the aid of technical assistance from rural extension workers who are trained in these techniques and assigned to the residential zone.

Once this is accomplished, surpluses could be transferred from central points in the zone to refrigerated trucks destined for factory outlets, such as Saprolait or Senlait which are outside Dakar.

Enormous barriers prevent this type of development effort in the near future. Some of them are as follows:

(1) uncertain water and grazing resources for livestock -- These two problems require infrastructure building, in the form of bore-wells to secure year-round water and the expanded attempt to supply conserved and preserved grasses in cement bins as food stock for the animals;

(2) non-existent road network -- This problem would also require a commitment to road building; and

(3) non-responsiveness of the existing dairy marketing system in the country to the internal dynamics of supply and demand.

Berniard and Lavenant (1976:128) show that the dairy needs of Senegal are almost entirely satisfied by importation, which presently represents two million CFA francs each year; since the installation of the factories which sterilize and

homogenize milk, and kake yogurts and condensed milk, imported products have dropped in quantity. The dairy factories in operation do not service the Fulani district.

These Fulani expressed the desire that their surplus milk be channeled into an outlet such as the factories of Saprolait or Senlait.

A SODEVA official stated that it would be possible for SODEVA to provide the rural extension services necessary to provide the technical skills needed in the initial treatment of milk, and instructions in how to prepare yogurts and even cheeses.

Of course, this all possible only if monies for personnel, equipment, and vehicles are allocated -- in other words, if a commitment is made at the national level to significantly lower its dairy importation, by concentrating on the development of the livestock sector of the economy. It would be to the mutual benefit of both the Fulani herdsman and the national economy if the indigeneous resource of surplus milk in the Fulani zones is no longer wasted.

To move toward a commercialization of surplus milk by establishing non-traditional distribution channels would mean providing training and new skills to Fulani herdsmen, thus moving them more securely into the national economy.

Participation in the Agricultural System as Advisors and Assistants

Some Fulani herdsmen have begun to move into the agricultural economy as advisors and assistants in the traction animal program. The traction animal program is part of the modern agricultural package designed to increase production yields.

It was mentioned earlier that during the rainy season of 1976, no rural extension worker representing agricultural agencies paid a visit to the Fulani zones. Some SODEVA officials stated that an investment in time and personnel in the zone for agricultural development would present a problem, because the transhumance cycle did not mesh well with the agricultural cycle recommended by SODEVA for farmers. So, while these Fulani were not officially drawn into the agricultural development strategy, in the sense of being on the official list of a rural extension worker or participating in the peanut cooperative, they were viewed as potential advisors and assistants by SODEVA to the traction animal program.

SODEVA very wisely utilized the knowledge and skills of recommended zone residents in the initial stages of its draft oxen program for the agricultural zones. Farmers in the agricultural zones generally had no experience with these particular animals. Breaking the animals in (yoking them), training them to respond to the simple work commands and allowing them to get adjusted to walking yoked together, often frustrated Wolof farmers who would strike a protesting beast that refused to stand up. Fulani herdsmen never found it necessary to strike these animals and worked skillfully with SODEVA in training them to the yoke.

This type of collaborative effort between SODEVA and the Fulani suggests possible future activities in which the Fulani would be drawn outside his immediate economy of livestock raising, by putting his skills with animals at the disposal of technicians in the agricultural economy.

SECTION II. SENEGAL: THE DELTA REGION

A. Farmers

Among farmers in the Delta region of Senegal, significant findings in terms of innovative strategies were as follows:

(1) an accelerated rate of out-migration;

(2) increased interest in vegetable gardening as a source of income; and

(3) increased interest in small irrigated perimeters.

B. Herders

The cattle herding population was more profoundly affected by the drought than the farming population in this region. Herders recognized that herding was not dependable as the sole means of meeting their economic needs. The most significant innovative strategies among these herders was the following:

(1) irrigated agriculture as a supplementary production activity; and

(2) a heightened interest in marketing cattle products.

Commercialization of Animals Which Were Not Normally Put on the Market

The herding economy suffered an abrupt and severe setback during the drought, which forced herders to commercialize animals which they normally would not want to sell. The dilemma for the herder has been to sell heifers and reproducing females which, in effect, endangers the entire reconstituting process at a time when herds are already diminished from the drought.

The data indicated that the effects of the drought were quite different for each animal species. Sheep, goats, and camels, for example, were being brought to market in 1977 in numbers exceeding or equaling the pre-drought situation. Cattle, being the hardest hit during the drought and the most difficult species to reconstitute, have not yet approached their pre-drought level of marketing.

The Wodaabe herder is coping with his increased need for cash by selling increased numbers of animals. Almost all revenue since the drought, has come from the sale of animals. One of the reasons for the increased need to sell animals, is due to the distinct distaste of the Wodaabe to move into other forms of income-generating activities.

To meet yearly expenses, the average herder family in the research sample was required to sell almost 16 animals (3.5 cattle, 9 sheep, 3 goats, and a negligible number of camels and donkeys). Noteworthy is the increased commercial importance of sheep in the post-drought context.

Migration in Search of Grazing Land and Income

During the drought, the pasture problem had become critical. Herders generally migrated to the north, but increasing numbers were going south and west, where water and pasture could still be found. The drought also precipitated another migration pattern up to Nigeria and to Cameroon.

Adaptive mechanisms under migration, varied in length and character. Of particular interest was the fluid situation of the refugee camp.

Nationals from Agadez were the first to live in this camp beginning in 1973. They were all herders. The recent

The "new adaptive mechanisms" that have emerged from the stresses of the recent drought seem hardly to be departures from pre-drought behavior. What was new was the rapidly increasing reliance on mechanisms that had hitherto been less frequent occurences.

-A-

An Accelerated Rate of Out-Migration

Among the sedentary cultivators of the Delta area, migration soared during the drought. Historically, migration had been an outlet, relieving stress in the Senegal River Valley (not to mention elsewhere in the world) for centuries. Productivity in Kassak has been consistently low. There were constant departures. The departures peaked during years of peak stress, in the 1960s and then again in the early 1970s. Throughout the Senegal River Valley, the drought years accelerated the rate of out-migration. The drought seemed to have been responsible for the formation of a large permanent rural labor force, moving about the river valley in search of temporary agricultural work. This mobile work force was often a substitute for local absentees, who had become part of the urban work force, as had many of the residents of Kassak Sud.

Increased Interest in Vegetable Gardening as a Source of Income

Vegetable gardening is exciting greater and greater interest among the sedentary farmers as a source of cash income. This was especially true in the environs of all the quasi-urban centers, where there are concentrations of people, such as government civil servants, who have dependable cash incomes and a taste for such dietary supplements.

Cabbage, tomatoes, carrots, and onions are the most widely cultivated vegetables. However, lettuce, green peppers, green beans, and cauliflower often appear in the constellation of vegetables cultivated.

Vegetable gardening is especially popular, during the dry season after the rainy season cereals have been harvested.

Increased Interest in Small Irrigated Perimeters

Despite the discouraging experiences in Kassak, interest is also growing in village perimeters; small irrigated perimeters of 50 to 75 hectares. Farmers initiated this idea

of small irrigated perimeters with relatively little input from the outside. Several of these have sprung up on the Mauritanian bank of the Senegal River.

-B-

Irrigated Agriculture as a Supplementary Production Activity

Herders were seriously looking for a supplementary economic activity. They recognized that herding was not dependable as the sole means of meeting their needs. They saw irrigated agriculture as an activity offering an excellent subsistence (and even cash) supplement, as long as the requirements of irrigated agriculture remained flexible enough to permit them to pursue their primary interest which is cattle herding.

Marketing Cattle Products

Herders also manifested an interest in marketing cattle products, especially milk. In the late 1960s and early 1970s, the UCOLAIT scheme, based in Saint-Louis, was organized for the purpose of collecting, treating and marketing milk from the Fulbe herds in the Delta area (*Diagne, 1974*). It failed for several different reasons. The present time may be a more propitious moment to begin a new project with similar objectives. SWISSAID has underwritten an apparently successful effort to collect, process and market milk products made from local milk in the area of N'Djamena, Chad (*Pfister and Ranch, 1977*).

Urban Drifters

The urban drifters, as ever, are looking for wage labor in the urban context. But, they have not cut themselves off from the rural areas by any means. They try to retain rights to the agricultural land in the rural areas to grow food for their family's subsistence and, if possible, to acquire some cash income. They, too are interested in main-season irrigated agriculture, as well as vegetable gardening as an off-season activity.

There are several types of concrete projects that merit further investigation. Off-season vegetable gardening deserves serious attention by donor agencies. Many of the sedentary cultivators and the refugees in urban areas have already turned to this activity as a source of revenue. The very option of vegetable gardening necessitates participation in the cash economy and, therefore, lends itself quite well to the intervention of outside institutions, that must justify their activities on a rationale of cost-benefit analysis.

The gardening operations need marketing advice. They could use extension services knowledgeable in the areas of variety selection and cultivation techniques.

Provision of these services, however, must be low in cost to the producer and they must not constrain the producer's economic autonomy; in other words, his ability to act as a free agent in the market. Otherwise, the risk of aborting a very promising departure is very great.

Herders have shown no interest in off-season vegetable gardening. They seem, rather, interested in marketing their cattle products, especially milk.

Farmers, herders, and urban drifters seemed interested in irrigated agriculture. Donors could be of great assistance in this area. The question becomes one of the type of irrigation project that donors ought to underwrite.

It has become clear that large project underwritten by intensive capital investment are not tailored to the needs of the people concerned. The financial requirements of the projects, when translated into organizational requirements at the level of the participants are often too constraining, to give the participants a return that they would consider satisfactory.

More appropriate than the large-scale capital intensive hydro-agricultural development, may be the small scale village perimeters which were developed mainly on the investment of local labor, with some supervision from representatives of competent outside institutions. Such development would protect local autonomy to a far greater degree, than capital intensive development would be able to. Small perimeter development has already begun in the Matam and Bakel areas of the Senegal River Valley, the latter of which is financed by the Agency for International Development.

On the Mauritania bank of the Senegal River there are several communities, among them a group of Fulbe herders near Dagana, twice visited by the research team. These Fulbe herders were attempting to develop independent villager perimeters on their own initiative. Adams (1977) records at least one such village on the Senegalese bank. There are probably more on both banks of the river. It would seem appropriate for a donor agency to cultivate ties with national extension services, with an eye toward timely information on such villages. Intervention on a modest scale (technical advice and a diesel pump) at the formative stages would be critical to the success of village perimeters.

This brings up a final and more general type of recommendation. From its experience, the research team felt that more modest and less capital intensive development projects -- projects that concentrate more on what might be termed "human development" -- hold more promise for success than the current generation of grand projects which the team saw in the Senegal River Valley.

SECTION III. UPPER VOLTA: THE GOURMANTCHE OF KOURI

The Gourmantche are sedentary farmers that cultivate cereal and raise a small number of livestock.

The most significant adaptive mechanisms were as follows:

(1) heightened economic expectations due to international relief intervention;

(2) increased interest in economic alternatives to farming;

(3) increased interest by women in innovative technology as a vehicle through which they could expand their economic activities;

(4) increased interest in the use of traction animals in the agricultural system;

(5) increased awareness of the need for more advanced farm tools and agricultural expertise; and

(6) increased integration of the peasant community into the national economy.

Heightened Economic Expectations due to International Relief Intervention

The data suggests that among the Gourmantche of Kouri, international intervention was a greater vector of change than the actual drought itself.

The impact of international response to the drought in the area seemed, at first, positive in that it expanded economic opportunities. However, further analysis of the long-range effects of economic change showed that social relations among members of the village were gradually altered and not totally to the benefit of the villagers.

One of the international responses was the provision of jobs in drought afflicted regions, in which local labor was hired to work on drought related projects.

Although this appeared to be positive, it must be examined in light of its long-range effects. New sources of income were welcomed by the communities. However, the types of jobs furnished by drought related projects were not self-perpetuating. What was to become of barrage builders, well diggers, and other laborers once those projects were terminated?

Pumping money into the economy without providing the means by which to perpetuate the prosperity, i.e., the means of production, expanded markets, etc., raised the level of general welfare for a short period.

Clearly, the need is for projects which are capable of replicating themselves. This would require harnessing needed national capital improvement projects to on-going or emerging activities of local farmers.

Increased Interest in Economic Alternatives to Farming

Economic alternatives to farming as a source of income became of increasing interest to farmers. Many young men, though remaining peasant farmers, started businesses as shopkeepers.

Other men chose to open "restaurants" to feed the growing number of strangers that presented themselves at the market; while older men sought to increase their cereal production.

These new economic alternatives emphasized the role of the peasant as a wage earner and as a profit maker. The economic transaction focussed the villagers' attention on elements originating outside of their communities. Urban centers were seen as sources of goods and cash. Intra-village social relations that provided access to resources and goods produced within the village, were gradually undermined.

Working as paid laborers, in many cases took many young men away from farming at the most important periods in the agricultural cycle. As shopkeepers, they were required to spend long hours in the stores; spend days travelling to and from central markets; and participate actively in all the local markets. Business ventures also required an initial outlay of cash which usually meant that young men would

devote more time to the cultivation of their private fields, in order to amass the necessary cash to launch themselves in business.

Increased Interest by Women in Innovate Technology as a Vehicle Through Which They Could Expand Their Economic Activities

The role of women in this new and expanded economic climate took on added importance. As the social relations of production that gave her access to surplus labor and goods dissappeared or were modified, women found that they needed more and more cash to buy certain goods and services.

Manufactured goods have replaced some of the industries that gave women access to wealth (weaving, for example). Consequently, women responded to the mounting economic pressures by trying to increase their economic productivity along traditional lines, namely, farming and marketing.

Other avenues were all but closed to women. Women are consumers of manufactured goods, yet they have no opportunities to invest in them as their husbands do. The trade of manufactured goods requires greater contacts with urban areas and foreign language skills which women have not had the opportunity to develop.

Reforms in farming methods, brought about by development agencies, still continue to address themselves to men only. In cases where men engage in some form of scientific agriculture, their wives continue to cultivate with traditional methods.

Women became increasingly aware of this and expressed a desire to learn new agricultural techniques. This expressed desire should be addressed through extension services.

Increased Interest in the Use of Traction Animals in the Agricultural System

Farmers in the Kouri region expressed an active interest in animal husbandry for various reasons: (1) animal drawn ploughs increase the productivity of the farmers' yields; (2) traditionally, animals were a symbol of stored wealth and could be exchanged for grain in times of severe food shortage; and (3) many farmers expressed a desire to be able to care for their own cattle rather than leave them in the care of strangers (hired shepherds), whom they did not trust entirely.

While responding positively to livestock husbandry, many farmers had mixed feelings about the possession of cattle. One one level, they were aware of the advantages of possessing livestock. On another level, animal husbandry, as they knew it, conflicted with farming. At present, some farming activities are limited by the presence of cattle.

Money must be budgeted for training farmers in modern methods of animal husbandry that are compatible with farming. The farmers have requested a permanent cattle park with an adequate water supply. Unless such a park can be built, wandering animals will be a continuing source of conflict.

Keeping the animals in one defined area would facilitate selective breeding and the training of animals for ploughing. In addition, such a park would be a collection spot for manure; potentially useful as fertilizer and as fuel.

Farmers also requested a vaccination park. The local vaccination park is cut off to the cattle by barriers of compounds and fields.

Increased Awareness of the Need for More Advanced Farm Tools and Agricultural Expertise

In various interviews, the farmers focused on their need for more advanced tools and agricultural counseling to instruct them in the ways through which they would be able to improve their farming methods.

Unfortunately, there is a serious lack of materials and teachers with enough expertise in scientific agricultural methods. The problems exist despite government efforts to change and improve the situation. For example, the rural education center in the research village recently acquired ploughs to be used for instruction in ploughing. However, the school had not been supplied with donkeys, thus, lessons in ploughing had to be postponed.

Farmers seemed eager to learn, but in many cases, they were not given complete information. In other cases, they were informed that they did not possess the tools or the supplies with which to implement their newly garnered information.

Farmers have learned that it is detrimental to the soil to burn the stalks and shrubs left on the land. Although the ashes left after burning provide nutrients for the soil, the long-range effect of burning is to deprive the land of

important nutrients. The farmer is aware of this. The reason this practice is continued is because the millet stalks and shrubs when cut down and allowed to decompose in place, would not sufficiently decompose to permit manipulation of the soil with hand tools. Preparation of the soil without animal traction would be impossible.

Most farmers have not been taught how to make fertilizer from the organic matter. Millet stalks, shrubs and other debris could be gathered, placed in a pit, moistened, and allowed to decompose during the dry season. This type of fertilizer is almost totally unknown in the area.

Although farmers and herders have a type of contract in which allows herders to bring their cattle into the fields during the dry season, the manure is not allowed to decompose in a moist area before adding it to the soild. Usually, the manure is simply allowed to remain on the ground where it is dried out by the sun and air and looses most of its fertilizing value. In addition, manure is generally not worked into the ground before planting the seed. Artificial fertilizer is virtually unknown in the area.

Increased Integration of the Peasant Community into the National Economy

History of marketing in the area reveals the growing integration of the peasant community into the national economy. The drought accelerated this integration, however, the integration was not of maximum benefit to the farmer. Purchase price of produce has remained low despite the increase in demand from the outside.

The outside penetrated, nonetheless, the marginal and remote area of the Kouri region. An area such as Kouri was not only a beneficiary of drought relief efforts, it was also a new source of surplus grain for speculators who supply grain to urban centers. Grain speculators widened their markets, thus permitting them to keep their purchase price low. As the farmers need for cash increased, so increases his efforts to produce surplus grain. Even scarcity of grain did not substantially augment the price of grain paid to the farmer by grain speculators.

Upper Volta has been recognized as one of the poorest countries in the world. It is lacking in certain principal elements that are necessary for success in the international economic arena.

SECTION IV. NIGER: THE ZINDER REGION

A. Farmers

Among farmers in the Tanout district of the Zinder region, significant findings in terms of innovative strategies were as follows:

(1) increased cultivation of food crops;

(2) intensification of usual secondary occupations; and

(3) migration for the purpose of finding income-generating work.

B. Herders

The herding economy suffered severely due to the drought. The most significant adaptive strategy among the Wodaabe herders was the following:

(1) commercialization of animals which were not normally put on the market; and

(2) migration in search of grazing land and income.

-A-

Increased Cultivation of Food Crops

A large number of farmers put much more emphasis on the cultivation of food crops to the detriment of the area's cash crop, which is primarily peanuts.

According to the annual reports of the Service d'Agriculture, peanut production in the Zinder department was the following (in tons):

1971	111,345
1972	146,971
1973	31,799
1974	71,425
1975	15,446
1976	46,400

The quantity of seed used appears to have declined, although farmers were obliged to seed more often than in normal years. Also, the source of seed shifted more toward the market, as many farmers, due to the extreme food scarcity, found it difficult to preserve sufficient seed.

The large majority of farmers reported a reduction in hectarage cultivated, as compared with the pre-drought situation.

There also seems to have been a number of changes in crop mixtures. The area planted in cowpeas and sorghum has gradually increased, as well as the area planted in manioc.

Intensification of Usual Secondary Occupations

There seems to have been an intensification of the usual secondary occupations, or the adoption of a new occupation altogether.

Firewood collecting, mat-making, blacksmithing, livestock trading, manure-selling, and calabash carving were some of the occupations that were found to have been recently adopted.

Migration for the Purpose of Finding Income-Generating Work

The existence of migration, accompanied by flows of wealth in the opposite direction, provided one of the strongest weapons against the drought.

Sedentary farmers found available employment opportunities in the south of the Zinder department and in the city itself. Some of the income-generating activities engaged in by these farmers were the following:

(1) construction of structures such as walls;

(2) brick-making; and

(3) water-carrying.

Daily wages for the migrants averaged about 150-250 CFA francs per day.

Migration was, as usual, selective, with males from 17 to 40 years old forming the vast majority. In Gourbobo, the northern most village, during the period of 1972 to 1975, there was at least one person in 22 compounds who migrated. This was out of a total of 68 compounds in the village. That figure is remarkable, for it means that in an area that received 147 mm of rain in 1972 and 208 mm in 1973, the vast majority of people found other means of coping with two successive miserable harvests.

arrivals were the Beri-Beri of Tanout, who arrived in early 1978 during the rainy season. They were farmers from villages located within a radius of 200 km around Tanout.

Families were broken up because of migration of variable length, particularly in the Touareg-Bouzou, who came from the Agadez region. One part of their family stayed in the usual residential region, while another settled in the Kara-Kara camp, and still another part of the family went on to Nigeria.

Interestingly enough, herders living in Kara-Kara devoted production time to farming in the manner as some of the Peuls of the region did. This involved clearing some of unoccupied land around Tanout.

In addition to farming their own plots, these herders took on work as unskilled agricultural laborers in the fields of small farmers for a wage of 200 CFA francs per day.

Strengthening an Adaptive Mechanism

The data seems to indicate that herders, who have begun to engage in the agricultural system, could be supported in terms of technical assistance concerning the new skills they are acquiring. The assistance will make no sense unless it can be directly tied to their willingness to engage in those agricultural activities which net an immediate cash benefit.

Successfully competing countries must have the following elements in their economy: (1) control over internationally valued resources; (2) control over the means of production of manufactured goods; (3) capital; (4) abundant labor supply; and (5) markets.

Upper Volta is missing all but labor supply and markets. This means that as economic pressures are intensified, migration will increase, thus depriving the country of its most valuable resource.

Given the state of the Voltaic economy, the wisest policy to adopt, is perhaps, to focus on rendering the country as self-sufficient as possible, at least on the village level where most of the population resides. Villages have been traditionally self-sufficient, producing the necessary items for their subsistence for centuries. These elements of economic indpendence are gradually being undermined as more of the population participates in the relatively new economic order. Nevertheless, self-sufficiency can be restored and expanded to meet the growing demands of the population.

First, on the priority list to be developed should be the staple food needs of the population. Land erosion and, consequently, diminishing crop yields are perpetual problems. However, some development agencies, notably, C.I.D.R., working in Gorom-Gorom have shown that yields can be double, or tripled, using selected seeds from local varieties. Donkeys and oxen ploughs, as well as fertilizer, are all crucial to increased yields.

With minimum affordable investments, the farmers have not only progressively increased their yield for the past three years, they have also improved the quality of the soil (personal communication, Bill Hereford , Oxfam).

Village industries could be developed in order to meet the growing demands for certain types of tools and goods. Villagers have taken the initiative in many cases, to provide themselves with modern manual tools with which to increase production, e.g., sewing machines, farming tools, etc.

Aid, in the form of agricultural instruction and expertise, in quantities sufficient to reach all farmers; as well as intermediate technology powered by energy sources indigenous and available in the country, thus requiring minimum financial investments; are two of the most important elements on which to focus in order to help build relatively self-sufficient village societies.

CHAPTER THREE

FIELD PROFILE: SENEGAL DIOURBEL REGION*

Geography and Climate:

North of the equator on the westernmost tip of Africa lies Senegal, which extends inland from a 300 mile coastline on the Atlantic Ocean. Senegal's western border is the Atlantic Ocean and Mali borders it on the east. The Senegal River marks the northern border with Mauritania and Guinea and Guinea Bissau mark the southern border. The total land area is approximately 76,000 square miles, which is mostly a flat plain. Most of the country is less than 300 feet above sea level, except for a corner of the southeast where a few ridges rise above 1,300 feet.

Senegal is geographically cut off from its southern half, the Casamance by the Gambia, a former British colony which penetrates more than halfway eastward into Senegal from the Atlantic. The term "Senegambia" refers to the cultural area of these two countries.

To the south of Dakar in the Sine Saloum region is the Saloum River and its short tributary, the Sine, both of which are branches of the Atlantic. Though small boats can travel up the Saloum during the rainy season, both the Sine and the Saloum are dry during the remainder of the year. The remaining major natural water resource is the Casamance River in the southern part of the country. It is a tidal salt river for approximately one hundred miles inland, drains twenty miles wide and is useful as a navigation route.

The usual rain season extends from May to October in the southern part of the country; from late June to late October in most of the central part of the country; and from July to September in

*This report is an excerpt from Ms. Ware's dissertation in Anthropology for the University of Michigan.

the north. Between November and January there is no rainfall as a rule. Rainfall ranges from about 200mm in the north to about 900mm in the southern Casamance area.

Vegetation and Crops:

Due to the variability of rainfall from north to south, natural vegetation also varies from desert flora to rain forest flora.

In the central part of the country, millet, sorghum, and peanuts are the major crops cultivated. Several minor crops; namely, niebe, or cowpeas, sorrel (*bissap*), tomatoes, red peppers, bitter tomatoes, and gourd melons are either interplanted with millet crops or grown separately close to the compounds.

History and Ethnographic Configuration:

There does exist archeological documentation that hunting and gathering peoples lived in parts of Senegal as early as 50,000 B.C. By the Neolithic period, agriculture was widespread throughout much of the area north along the Senegal River. Despite this apparent early peopling of the area, little or nothing was known of this part of Africa, until the introduction of the camel revolutionized travel into Africa about the time of Christ and made contact between Senegal and the Mediterranean possible. Travel by camel brought Arab travelers, traders, geographers, and Muslim writers.

According to some of these traditions, a series of West African kingdoms existed in the Senegal River valley in the tenth and eleventh centuries. One was the kingdom of Tekrur, in what is now northern Senegal. Barry (*1972*), Diop (*1972*), and Joire (*1951*) present the argument that the Senegalese kingdom of Djoloff, came into existence as a result of population movements and upheavals resulting from the decline of the Ghana empire in the thirteenth century.

The Wolof - Origins and History:

The history of this kingdom begins with the story of its founder Ndiadiane Ndiaye whose appearance in the already established coastal state of Waalo (*Barry 1972:68*) is shrouded in legend. Ndiadiane

Ndiaye was the first Djoloff king whose power eventually spreaded from the Djoloff in the northeast of Senegal, and Waalo on the coast to all of Senegal, which was divided into client states under the Djoloff king. Client rulers were appointed by the Djoloff king and the autonomous areas were Waalo, Cayor, Baol, Sine and Saloum.[1]

The first person to write about the Wolof was the Venetian sailor, Alvise da Cada Mosto, who sailed a Portuguese vessel under the reign of Don Henry of Portugal in 1455-57 (*Kerr, 1811:200*). Cada Mosto described the political organization, religion, and daily life in the Djoloff kingdom:

> "The first kingdom of the Negroes is on the banks of the Senegal, and its inhabitants are called Gilofi or Jalofs (1811:221).
>
> "The king has no settled revenue; but the lords of the country court has favor by making him yearly presents of horses, which being scarce, are in high estimation... He likewise increases his wealth by means of robbery, and by reducing his own subjects, and those of neighboring provinces to slavery, employing a part of these slaves to cultivate the lands which are assigned to him..." (1811:222).

From this account and later, interpretations and analyses by scholars such as Diagne, 1967; Barry, 1972; Diop, 1972; Thiam, 1949; Silla, 1966; Klien 1968; Coifman, 1969; Markovitz, 1970; and Gellar, 1976; the client states supported a rigidly hierarchical social system. This stratified society was divided into three major groups, whose structure is important in understanding the process of adaptation and transformation in the present-day society.

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[1] Sine and Saloum were client states with a Serer ethnic population. See Martin Klien's study, Islam and Imperialism in Senegal, (Stanford, California: Stanford University Press, 1968) for further details of these states.

Descendants of the legendary founder of the Wolof kingdom, Ndiadiane Ndiaye, ruled over Djoloff with the title of bour. Client rulers had the title of lamane and owed their allegiance to the bour of Djoloff. The social hierarchy consisted of three principle social groups:[2]

(1) the geer or freemen,
(2) the nyeenyo or occupational castes, and
(3) the dyaam or slaves.

Freemen were divided into the superior class and the lower class or commoners. The superior class was further divided into (a) the garmi which consisted of the high nobility who had a right to the throne, (b) the tany who belonged to the garmi by matrilineal birth, but could not pretend to the throne, (c) the kangam who were chiefs belonging to the garmi with the right to command territories or villages, and (d) the doomi-burr or tara who were the offspring of a prince and slave. They also had the right to command territories or villages. The lower class of freemen was called the baadoolo and constituted the large peasant mass. According to Barry (p. 89), the word baadoolo in Pulaar is wasde doole which means "'not having any power'" and sums up the status of this class which was defenseless in the face of the nobility.[3] Gellar (1972:11) points out that although

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[2]This discussion of social structure and social organization is based on Boubacar Barry's study, Le Royaume du Waalo, (Paris: Maspero), 1972:87-92.

[3]The principle informant for this study, Thierno Sow, informed me that the baadoolo were people who were free but had no control over what they produced. They were not of the occupational caste and were more respected in the social hierarchy than the occupational caste or slaves. They farmed, but their granaries and animals were taken at will by the tieddo in the name of the crown. Thierno Sow went on to point out that to call someone a baadoolo today is considered an insult, since the term has taken on a derogatory meaning.

the baadoolo had higher social status than the tieddo,[4] they had less power than the tieddo and as farmers who produced for a living, were often raided for food and slaves by the tieddo, as well as subjected to high taxation.

The nyeenyo or occupational caste were also freemen, but below the baadoolo in the social hierarchy. Their production functions were geared to the economic and social needs of the society. Among this group were jewelers, blacksmiths, leathersmiths, and praise-singers or griots who were the official archivists and genealogists, especially for the garmi. The nyeenyo relationship to the garmi was one of patron-client, remains so today, and is especially exploited by the griots, often to the irritation of their present-day 'patrons.' Gellar (1972:12) points out that in spite of their low social status, the nyeenyo "were generally wealthier than the commoners, because of their monopoly of the manual trades and their client-relationship with the rich and powerful elements of society."

At the bottom of the traditional social hierarchy, were the dyaam or slaves who were divided into domestic slaves and commercial slaves. The former were further divided into slaves of the crown (*to which the tieddo belonged*) and slaves of the house. The latter were a commodity of trade and as such never became incorporated into the social structure.

Tensions between the baadoolo and the tieddo concerning raiding, plundering, and exaction of taxes has been documented by Barry, 1972; Markovitz, 1970; O'Brien, 1971; Klien, 1968; and Gellar, 1976.

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[4] The tieddo were warriors. They were slaves of the crown and of low social status, yet they were considered part of the nobility and very often played dominant roles in displaying their loyalty by carrying out their ruler's decisions. The tieddo past is one of antagonism toward Islam and O'Brien (1971:17f) notes that the tieddo "has kept to this day the meaning of 'bad Muslim,' a drunken, violent, and irreligious person. Ousmane Sembene, in his latest film, Ceddo, does characterize the tieddo as imbibers of wine, but more importantly as resisters of the erosion of the traditional social structure.

The defenseless baadoolo often aligned themselves with Muslim clerics or marabouts against the tieddo, as Islamic presence became a stronger and stronger force to be reckoned with.

Ethnic and Population Configuration:

Senegal's total population of approximately 4.2 million is predominantly rural and it is estimated that seventy-five percent of the population is engaged full-time in agriculture as an occupation. Generally speaking; ethnicity, residence, and occupation are synonymous.[5] In 1976, the estimated population by major ethnic group was as follows:

(1) Wolof: They are approximately 1,400,000 or one-third of the population and the dominant ethnic group. It is their language and customs which are most characteristic of Senegal. They are found throughout the country, but for the most part live in Dakar and the towns and rural areas of the three major peanut zones of the regions of Thies, Diourbel, and Sine Saloum. There are many merchants among them, but they are primarily small subsistence farmers;

(2) Serer: The Serer are approximately 700,000 or seventeen percent of the total population. Their major residence is the Sine Saloum and they are also subsistence peanut farmers who also practice livestock husbandry, which in many instances amounts to a mixed economy of farming and raising livestock;[6]

(3) Lebou: The Lebou are approximately 70,000 and while some are farmers, they are primarily

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[5] Sylvie Berniard and Hedwige Lavenant, Le Senegal en Chiffres. Annuaire Statistique du Senegal (Dakar: Societe Africaine d' Edition), 1976, p. 30.

[6] See David Gamble's section on the Serer with bibliography in The Wolof of Senegambia (London: International African Institute), 1957:97-105.

fishermen by occupation. They are coastal people whose language and customs are Wolof;[7]

(4) Peul: The Peul or Fulani are approximately 500,000 and reside primarily in the northeastern Ferlo and southeastern part of the country. They are pastoralists, primarily semi-sedentary transhumant pastoralists. Their language is Pulaar and only those who maintain direct contact with Wolof through commercial activity speak Wolof.[8]

The Fulani, one of the largest ethnic groups in Africa, are spread over the West African Sahel Savannah belt of wooded grasslands, from Senegal to east of Lake Chad, and to northern Cameroon (*Greenberg 1949, Stenning 1959, Nelson 1974*). Their language, Pulaar, which Greenberg (*1949:192*) calls Fulani, is spoken by approximately seven million people throughout West Africa and is, according to Greenberg, "closely related to Serer-Sin, a relatively obscure language of the Senegal area and exhibits a somewhat more remote connection with the Wolof language of the same general area." Pulaar is the second largest spoken language after Wolof in Senegal, and belongs to the Niger-Congo Atlantic language family. The origins of the Fulani have not been definitely determined, but Delafosse (*1968:159, 1972:415*) has argued that they are of caucasian origin and their language is an Asiatic derivitive; while Greenberg (*1949:98*) argues, based on linguistic data, that "Fulani bordering the closely related Serer and Wolof must be looked upon as the nucleus from which other Fulani-speaking groups broke off and migrated eastward and southward." Nelson argues that "their nomadic ancestors are thought to have come from the area north of the Senegal River and to have moved gradually southward and eastward during the last four hundred or five hundred years" (*1974:70*). Pelissier and Journaux (*1968:10*) argue that the numerous groups of Fulani came from the east. A group of Deckvotte

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[7] Ibid., pp. 93-96.

[8] The Senegambia Fulani are referred to as Fulbe and are usually designated Peul by French speakers and Fulani by English speakers.

residents claim their origins as the eastern part of Senegal, but it is not conclusively known whether they migrated eastward from the north or moved westward into Senegal from the east.

The Senegambia Fulani are referred to as Fulbe and are usually designated Peul by French speakers and Fulani by English speakers. Fulani populations exhibit striking differences in how they have adapted to the varying environmental niches in which they have settled. Their economic and food production systems, social organization and level of political autonomy can be viewed as on a continuum from nomadic, to semi-nomadic, to semi-sedentary to sedentary (*Raay 1974:29-30*).

(5) Toucouleur: The Toucouleur are 300,000 or seven percent of the total population and live primarily in the Senegal River valley. They are also Pulaar speakers, but differentiated from the pastoral Fulani based on their occupation as sedentary farmers; and

(6) Diola: The Diola are 345,000 or eight percent of the total population and are the most important ethnic group in the Casamance in southern Senegal. They are primarily rice cultivators, but have begun to grow peanuts.[9]

These are the major ethnic groups in the country, and while each maintains many of its own customs and even language, Wolof is the national indigenous language and spoken by all who move in the mainstream of Senegalese social and economic life.[10]

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[9]See Olga Linares De Sapir, "Agriculture and Diola Society" in Peter McLoughlin (ed), African Food Production Systems (Baltimore: John Hopkins Press, 1970), pp. 193-227, for a good discussion of traditional Diola rice production and the movement into peanut production by large numbers of these rice producers.

[10]French is the official language of business, government, and commerce in Dakar; however, two Senegalese bureaucrats or businessmen will generally conduct verbal office-hour communications in Wolof.

The Maures are a very small percentage of the total population, numbering approximately 57,000. They are comparative latecomers to Senegal. They began to settle in isolated pockets of the north during the nineteenth century and engaged primarily in animal transport. Many of them settled as strangers in rural villages in the peanut basins in the central part of Senegal. During the 1970's most of these Maures were small shopkeepers, butchers, and jewelers in the cities and large towns, especially in Dakar, Saint-Louis, and Kaolack.

A small group of Maure families figure fairly prominently in this study, as an illustration of village exodus and resettlement in an urban setting as daily wage laborers.

Traditional Production Systems and Production Behavior:

The traditional production systems and production behavior is the background against which innovative strategies evolved. The usual income and food producing systems operating in the Wolof farming district of Ndame are as follows:

(1) Peanut farming: It is within this production system that the small farmer realizes his basic annual income of several thousand CFA francs, which is destined to pay for personal and compound essentials such as clothing, shoes, repair items for dwellings, courtyard enclosures, and installment payments on outstanding debts. The risk to the farmer is very high, because he has no control over alterations such as changes in the producer price for his peanuts, drought or crop predators.

(2) Millet farming: Millet farming is the basis of the food system among Wolof farmers and does not enter the commercial stream on the same scale, or for the same reason as does peanuts. Its value is deeply embedded in the social system and lifestyle of the Wolof, thus millet represents much more than a meal. The stalk residue from the harvest, for example, is used in courtyard enclosure construction and house repairs. Millet has an important redistribution role in all life crises; baptisms, circumcisions, weddings, etc. Also, the noon meal for work parties who assemble to weed or to press harvested

millet into the granaries are served substantial bowls of a millet dish. Millet, then, is food; but more importantly, it is the symbol of social cohesion and links to various groups of people who are essential to a person's social and economic existence. Yet, millet production is less than sufficient to adequately feed village populations fron one harvest to the next.

The largest compounds in the research villages contained twenty members who consumed 8 kilos of millet each day. This meant that each person consumed 133 grams per meal or 400 grams per day. The yearly millet harvest should be at least 2,920 kilos or 3 tons. The daily consumption level was very small and the data suggested that the families in the research compounds and villages are undernourished. The daily ration should be at least 250 grams per person per day, which means that a compound of twenty people should consume at least 15 kilos of millet per day instead of 8 kilos. This then means that the yearly millet harvest should be 5,475 kilos or 5½ tons. Half of the total 62 compounds in one of the villages planted five or more hectares of millet, but not one among them harvested five or more tons.

According to the research data from SODEVA, 1 hectare of land well prepared and properly maintained can yield at least 1 ton 300 kilos of millet, instead of the average 300 kilos.

What this means is that the small farmer is forced to resort to purchasing millet as early as March, because his granary is empty. Whether millet is purchased on credit or paid in cash, the small farmer has to have access to cash which, in all probability, has not been earmarked from the annual income from the peanut harvest, he engages in non-farm dry-season activities to feed his family from one harvest to the next.

(3) Dry season income-earning activities: Farmers know that the lean season will begin in March or April and lasts through the millet harvest in October. It is this period when they have neither money nor millet reserves and must figure out ways of making ends meet. Some operate small consumer shops

year round as a buffer between their families and extreme hunger. The majority of the compounds have younger members who begin the seasonal search for work in neighboring towns and the cities. Compound members engaged in remunerative activities, tended to be the younger unmarried males from seventeen years up. There was also a sizeable number of compound and household heads working, or looking for work. The most prevalent seasonal occupation tended to be petty trade and daily wage labor.

Fulani Herders and Their Production Activities:

The basic Fulani income and food producing system is livestock raising and herding. Reproducing and milk cows represent the means of production for the herder. Livestock husbandry consists of a rainy season and dry season cycle of movement.

(1) Rainy season herding: From late June to early or late December herds remain in the residential zone where they feed on grasses and leaves, natural to the grazing areas of the zone. They are watered every day in rainy season ponds. Herd managers tend to be the younger brothers of compound heads and shepherds are the sons of herd managers, as well as the sons of compound heads. The Fulani in the research zone depended, to a large extent, on the milk of their cows. Production yields of the livestock are very important since it is the milk, butter, and offspring -- not the meat itself -- which is the basis of the food and income production system.

(2) Millet farming: Millet farming has been a part of the rainy season food production system for at least three generations and is primarily the responsibility of the men (*more specifically, of the compound head*). Millet plots are very small and poorly cultivated. Plots are generally close to the compounds and range in size from 1/4 hectare to 1 hectare with the average size being 1/2 hectare. Harvests are small, smaller than they could be, and usually never more than 500 kilos. This means that, like the Wolof farmer, the cereal food stock is always depleted before the next harvest season.

(3) Dry season herding: Except for some milk cows, the majority of the herds are moved, starting in early or late December, to grazing zones

along established transhumance routes. It is during this period that the opportunity for augmenting the millet stock and making some money is available. Herders from this zone maintain a long-standing dry season transhumance pattern along the southern and southwestern commercial routes. They set up camps near large agricultural villages and towns, which provide market outlets for milk/millet exchanges and sale of animals.

(4) Livestock trading: This activity operates on levels based on the social status of the males participating. Sporadic trading during transhumance is nothing new to the herd managers and their assistants. Trade in cattle is most often the province of compound heads, some of whom have become full-time cattle traders at the cattle market in Dahra. Trade in sheep and goats is generally the province of herd managers and other younger brothers of compound heads.

(5) Itinerant trading: The trade in amulets and medicines by Fulani herders referred to as "medicine men" in the Gambia is discussed by Ames (1962:46, 46f); and is a flourishing activity for young compound members and some compound heads during the dry season. It became an intensified activity after the drought, in terms of the number of participants and distances traveled.

(6) Plant gathering: This activity is the sole responsibility of women, who perform this task every day. This is a traditional task for the purpose of supplementing the evening meal.

Social Relations and Production:

The social and territorial nucleus in Wolof society is the family. Traditionally, it was the extended family which included the living and dead members in time and space. Under the impact of Islam, French law, and the commercialization of the economy, the Wolof family has assumed more and more, the territorial and to some extent, the social structure of the nucleus family. The holder of land rights in the family is the oldest male. In the past it was the patriarch; today, it is the household head who is the manager of the family's finances. The social hierarchy in the compound is reflected in the

hierarchy of agricultural activity:

(1) The compound head: He is responsible for the needs of his dependents, who express their dependence on him in their production relationship to him. They give him free labor on his personal fields and millet allowances, which he guards and redistributes as it is needed.

(2) The surga: This is an unmarried adult male, who is housed and fed by the compound head. At Ngabou, the surga was most often the youngest brother or sister's son, and sometimes the brother's son of the compound head. There are villages in which the surga is not at all related to the compound head, but this does not preclude the fact that the compound head has the responsibility for the surga's room and board. The customary relationship is room, board, and a parcel of land for the surga in exchange for gratuitous labor in the compound head's fields. Generally, the surga works the fields of the compound head during the morning and his own during the afternoon. He has full control over the disposition of his peanut harvest and quite often over his millet harvest also. He may sell his millet to the compound head if he so desires. In almost one hundred percent of the compounds which had surgas, the surgas left the compounds during the dry season to pursue income-producing activities in the surrounding towns or distant city of Dakar. Those laborers not related to compound members were simply referred to as navetanes, but the relationship to the compound head was the same as that for the surga.

(3) The wife or wives of the compound head: They have total responsibility for all domestic tasks, such as drawing water and transporting it to the compounds; searching for firewood and transporting it to the compounds; pounding millet; and decorticating peanuts. They also farm their own plots of peanuts, sometimes millet, as well as do some weeding and chasing birds and other predators from their husband's fields. Their peanut harvest is theirs to dispose of as they see fit. Their millet harvest belongs to the compound granary. They are responsible for winnowing and pounding the millet. Their plots tend to be very small, the millet plot and the peanut plots being between one-fourth and one-half hectare.

(4) The non-taxable; children and the elderly: Children and the elderly are not taxable members of the compound and are not expected to assume full responsibility for plots they have (*this applies to the elderly, both male and female*). Female children help their mothers decorticate peanuts before planting time; both male and female children help with the weeding; they run errands such as bringing water or carting manure, when its used, to the fields. They provide the bulk of the labor during the period of chasing birds and other predators from the fields.

None of this labor can be separated from social status in the basic social and territorial unit which is the compound. A person's status and position in the compound is defined by the agricultural tasks he performs.

In his capacity as family head and economic manager, the essential task of the compound head is the division of the family land according to the needs of each elementary cell. He can utilize his domain as he sees fit, the only restriction being that he, ideally, cannot alienate the land through a type of rent or "mettre en gage", which is the pawning or pledging of land for a set sum of money. In this instance, the land reverts back to the 'owner', when the money borrowed against it is repaid to the lender. At Ngabou, it was not easy to know how often or who had pledged portions of their land for cash needed at a pressing financial moment. It was considered poor management and the beginning of the end to do this, therefore, it was not readily discussed by everyone. The small number of hectares cultivated by the Dioufs, along with discussions with other compound heads, indicated that parcels among the Dioufs had been, at various points, pledged and would not revert back to them.

It is important to understand that even more important than possession of land is the possession of, or ready access to, a large manpower pool. This is among the most desirable of possible forms of wealth, but Ngabou's households are sorely lacking in manpower adequate to effectively assume full agricultural tasks. In the past, Ngabou had the manpower of slaves and clients. Today, the households have sons and nephews who are forced to be away from

the compounds a great portion of the year in pursuit of work in the towns. It is the case, therefore, that the partition of land is related also to the capacity of work of each elementary unit (*Pelissier 1966: 133*).

Major External Factors On Social and Economic Life:

Before the Wolof emerged as a distinct group in Senegal, Islam became a factor in the eleventh century, in the Senegal River Valley. Despite this early start, it made no seriously dramatic headway until the last half of the nineteenth century, when the Wolof state system entered the final stages of disintegration. By the mid-seventeenth century, the French had become another major factor in Senegal. French trading companies were first established in 1659. The first trading post was named St. Louis. For the next 150 years, St. Louis was the center of French commercial activity in West Africa. The crisis in the Wolof state system had its roots in eighteenth century Islamic religious wars, which began in northwestern Senegal and were brought to an end by French conquest in the late nineteenth century.

In the mid-1800's, a member of the Toucouleur ruling class, El Hadjj Omar embarked on a religious war against the peoples of the upper Senegal and the expanding French traders. El Hadjj Omar was defeated by the French and forced to retreat into what is now Mali. This threat to French trade provided the French an opportunity to extend their control in West Africa, through military conquest under the leadership of the military leader Faidherbe. Faidherbe was more than a military conquerer. His conquests were inspired primarily by the economic purpose of extending his administration over a sufficiently large area of territory to secure prosperity for the French traders based at St. Louis. In addition to his military work, Faidherbe sponsored the development of peanuts as the crop to be cultivated for export.

Mobilization of two existing resources, the Senegalese farmers and French trading companies served as the implementation centers for this export enterprise.

The primary way in which farmers were drawn into the peanut economy was through taxation, payable in French currency. A measure of the commitment to

growing peanuts by the small farmer can be attested to by the fact that over a hundred year period, from 1875 to 1975, peanut production has increased from around 13.9 thousand tons to 1,180,000 tons.

The Mourides and Peanut Expansion:

An aid in the expansion of peanut production was the commitment of a Muslim brotherhood, the Mourides, to peanut production.

The Mourides are a Sufi brotherhood which evolved as a response to the social and economic crises resulting from French conquest.

The decisive battle at Dekkile in 1886, in which the French defeated the Wolof army, resulted in the final and total disintegration of Wolof traditional structures and sent people of all classes scrambling for leaders to replace those destroyed in the power confrontation. The traditional patrons could no longer support their clients, since the traditional economic system no longer had meaning. It was precisely for this reason that Amadou Bamba, the founder of the Mourides, attracted so many people who were to form the nucleus of the Mouride brotherhood. It has been documented by scholars of Mouride history, such as Paul Marty (1917), that Bamba's following was composed mostly of the dyaam, the baadoolo, and the tieddo, who adapted to the new situation by accepting Islam as the way to restructure a patron-client relationship in their lives. These people were principally Wolof of Cayor and Baol, who submitted to Bamba and formed collective units in which they farmed and performed other tasks. The essential structure of this relationship was marabout or scholar of the Koran; and talibe or student of the Koran, in which the talibe submitted to the teachings and guidance of the marabout, in return for the promise of salvation and eternal life. The patrilineal residence of the founder of this brotherhood, Bamba, was located in the Diourbel region, to be more exact, it was located in the district of Ndame. This founder was a Muslim teacher and Koranic scholar, who returned to the Diourbel region after the decisive battle of defeat in 1886. He attracted a massive following of people in search of a new socio-economic structure for their lives. These people were principally Wolof, who submitted to the religious

teachings of Bamba and to his call to work: to grow peanuts.

At some point during this period of social and economic adjustment, Bamba alledgedly had a vision in which he received a revelation to found a mosque which was eventually constructed at Touba, the present-day headquarters of the Mouride brotherhood in the district of Ndame. From that moment he was revered as a saint by those who believed in the vision and his following continued to grow. As the following of talibes swelled, some of Bamba's brothers and close associates became intermediaries between Bamba and his followers, since it was believed that a talibe could benefit from the power of Bamba through association with one of Bamba's close relatives or associates. Bamba had nine brothers who had their own talibes and the youngest, Massamba Mbacke, was responsible for the creation of Darou Karim, which is one of the two Wolof farming villages profiled in this study.

Land expansion and Mouride consolidation are co-terminous with extensive peanut farming in the Baol. The herding way of life was literally trampled over, as herders were pushed to the desert fringes by Wolof farmers with support of the colonial state apparatus. Peanut farming became the major production concern and activity, to the detriment of millet farming and livestock husbandry. G. Hardy (*1921:289*) quotes the French governor Protet as saying that "peanuts will save the country." Whether peanuts have actually saved or sunk the country is open to a great deal of discussion. The fact remains that for almost 100 years peanuts have accounted for approximately ninety percent of Senegal's export. This is extremely important, since the successful production of this crop is largely determined by climatic conditions. Between 1960 and 1970, the peanut crop contributed approximately sixty percent of value added by the agricultural sector of the economy; and more than seventy percent of total exports (*World Bank Economic Report, 1974:138*).

The Peanut Economy and Independence:

The importance of peanuts to the economy of the country was evident in the establishment of the Societe de Prevoyance in 1919 by the colonial state.

The Societe de Prevoyance was created to provide the small and poweful French import-export houses and peanut oil manufacturers a monopoly marketing system for Senegal's peanut crop; and to provide a stockpile of peanut seeds against poor harvests. The idea of a stockpile of peanut seeds against poor harvests has not changed and is embodied in the present-day seccos or storage facilities for peanuts, but the marketing of peanuts has become the monopoly of the independent nation-state.

Dependence on the peanut, as evidenced above, can prove very risky to the small producer as well as to the national government. A recent example of the powerlessness of the small producer, commited to the peanut monoculture and practically exclusively dependent on the peanut crop for his livelihood, was the case of the Yaounde Convention in 1963, which established the requirements for association with the European Economic Community of former French colonies.[11] In order to conform to EEC requirements, France's twenty percent subsidy of Senegal's peanuts was to be phased out over a period of years and also the guaranteed purchasing quotas. Senegal's peanuts, which accounted for between seventy and ninety percent of the country's export earnings, had long been sold almost exclusively to France. The phasing out of France's price supports and guaranteed purchasing quotas, represented a serious threat to the relative stability of the one-crop export economy. One of the responses of the government was reforming the national rural development strategy. Modified production was to be elicited from the farmer in the form of increased peanut production, the purchase of farm tools and fertilizers (*the use of which the farmer had little knowledge or experience*) and interfacing with rural extension workers who would offer advice in the care and use of equipment, fertilizer, and improved farming techniques. The rationale behind the modification of the national rural development

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[11] For a more detailed account of the events of this Convention see Edward J. Schumacher, Politics, Bureaucracy and Rural Development in Senegal (Berkeley: University of California Press), 1975:116.

strategy was that the removal of the twenty percent price supports would lower export earnings and the only way to maintain earnings at a level at least comparable to the pre-Yaounde Convention level, would be to produce and sell more peanuts at the lowered price. The modification had the possibility of some success for the long range, but the small farmer saw no logic or benefit in growing more peanuts at a time when the price was falling. The small farmer was left to his own devices, while the government (*by 1964*), had commissioned a French development assistance firm, SATEC (*Societe d'Aide Technique et de Cooperation*) which was funded by France and the EEC to implement the rural reform strategy with the following modifications: (a) the primary objective was to achieve a twenty-five percent increase in peanut and millet yields over a three year period; and (b) the geographical scale of the project was quite extensive -- it included a portion of the Diourbel region and one other region, a total of thirty-nine districts with a spread effect to approximately 165,000 farmers. SATEC had responsibility for coordinating the marketing and credit agencies, the peanut cooperatives, and the recruitment, training, and supervision of a team of rural extension workers. Government contact and feedback would be through this cadre of rural extension workers who would work and live in the villages. This cadre of workers would be supervised by a staff of young graduates (*mostly French*), of European agricultural schools.[12] By mid-1965, rural development officials in Dakar were anxious to see the strategy in operation and requested that SATEC assume full responsibility for distribution through the credit program, of farm tools and light machinery; namely: seeders, hoes, carts and fertilizer. Extension workers began compound-to-compound visits, urging farmers to purchase these inputs on credit. One of my informants, Ibra Dieng, president of the peanut cooperative at Darou Karim summed up very succinctly the attitude of the small farmer to this campaign:

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[12] For a fuller discussion of the operationalization of SATEC and its problems, see Nathaniel McKitterick's article, "A Mass Attack on Low Productivity in Peasant Agriculture" in the International Development Review, 9(3): September 1967, pp. 2-6.

> "We certainly wanted to improve our living condition and I am not against development projects, but these projects always find us poor - too poor - to participate. I cannot buy fertilizer on credit and when the price of peanuts dropped I was not anxious to get involved in this new program (Interview March 1976)."

It was this attitude which surfaced again and again, both verbally and in actions, which lend support to the basic tenet of this study from a development point of view. This position was set forth in Part One:

A rural development strategy or project within a strategy, whether it is initiated by the national government or by an international donor at the request of the national government, should concern itself first and foremost with harnessing its activities to those on-going production activities of the small farmer and herder. This is necessary for the purpose of maximizing an increase in small farmer and herder general welfare and productivity, that can sustain and replicate itself through full utilization of local and indigenous materials, tools, and manpower and minimum of local and indigenous materials, tools, and manpower and minimum dependence on a network of external delivery services, materials, tools, and personnel. The small farmer simply cannot participate in programs which require expensive inputs and elaborate delivery and administrative services.

The colonial economic system inherited by the independent Senegalese government was dominated by the commercialization and export of the single cash crop of peanuts. The commercial system was controlled by a group of French trading companies. In the rural areas, small farmers were at the mercy of Lebanese merchants and Senegalese traders, both for the sale of their peanuts and for the purchase of millet and other consumer necessities at usurious rates. The farmer became enmeshed in a cycle of indebtedness, and the government under the First Republic made the first steps toward dismantling this private marketing and usurious credit system, by becoming the monopoly buyer

of peanuts in the country.[13] A set of interlocking government agencies were established to assume all marketing, cooperative, and credit functions for the State. Control of the peanut marketing system by the State was designed to destroy the middleman role as it existed during the colonial period, and rechannel the peanut economy more towards national development. The farmer was to sell his crop to the State, through this network of interlocking government agencies and services which transformed themselves, over a sixteen year period of time, from a network of several agencies to basically two: (1) the Office National de Cooperative et d'Assistance au Developpement and called ONCAD; and (2) the Banque Nationale de Developpement du Senegal called the BNDS.

Office National de Cooperative et d'Assistance au Development:

ONCAD was established in June, 1966, as part of the continuing evolution and refinement of rural development policy. It came into existence by executive decree, with full responsibility for the implementation of the agricultural credit program, the equipment distribution program, and the marketing of crops produced and sold through the cooperatives. It is a Janus-faced agency in the sense that it has a responsibility to the State in its administrative and managerial role, as the clearinghouse for credit and marketing; and it has a responsibility to the farmer in its role as the conduit through which the peanut cooperative should eventually become an autonomous body.[14] In its former role, ONCAD is a revenue-

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[13] The data indicated that the small farmer in the two farming villages and the herding zone are still caught up in a vicious circle of indebtedness.

[14] ONCAD representatives in Mbacke informed me that "soon the cooperatives would belong to the people which was the original design and philosphy." It is, according to them, "a question of readiness on the part of the farmer to assume full responsibility." The district ONCAD liaison officer stated that "as the cooperatives gain increasing control of their ability to fully manage their affairs - marketing, bookkeeping, communications, and maintenance - ONCAD will wither away."

earning agency and should show a profit, and in the latter role it should defend the interest and serve the small farmer. The implications of this structural contradiction are complex; yet simple, the small farmer's interests and needs are secondary to ONCAD's system of reporting and accountability to the government. There is no accountability to the small farmer. This is clearly illustrated in ONCAD's delivery system to the farmer of tools and equipment, as well as the rebate on the peanut harvest. The kernel of these issues is the lack of a system of accountability by ONCAD to farmers. ONCAD has in part blamed the lateness of the delivery of tools and equipment on a lack of transport vehicles.[15] The rebate is often a point of antagonism between ONCAD and the cooperatives. For example, both at Ngabou and Darou Karim, cooperative members complained about the lateness of the distribution of their rebate. The feeling was that ONCAD, which was withholding from them what rightfully belonged to them, should account for itself on schedule to clear up the season's business; and if it could not do this, it should be penalized in some way.[16]

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[15] The lack of adequate transport vehicles was true and SODEVA had assumed this delivery task based on its enjoyment of a larger operating budget than ONCAD. In fact, SODEVA was in the process of assuming an increasing number of tasks formerly under ONCAD, which seems to indicate that the SODEVA influence and jurisdiction is widening and ONCAD may "wither away" for reasons other than the emergence of autonomous farmer marketing cooperatives.

[16] After several years there remains some hostile feelings toward ONCAD concerning its method of debt collection before the entire agricultural debt was suspended in 1973. Several informants told me that beginning in 1968, they were harassed by agents of ONCAD who came to their homes at various hours during the day and late evening to collect seed and equipment debts. Many laughed while telling me that they made a point of being out of the compound when they thought agents might be arriving. They all stressed the point that they were not attempting to default on their debts, but that they just did not have the seeds to pay back nor money to pay the installment on farm implements bought through the credit program. Technically, a farmer cannot have seeds for the next season if he has not repaid the twenty-five interest in seeds at the end of the harvest. The farmer, thus, is accountable to ONCAD for non-delivery of payment, but ONCAD is not accountable to the farmer for non-delivery of goods and services.

The second intervening agency involved in the marketing system is the BNDS, which underwrites ONCAD's financial obligations to the peanut cooperatives. ONCAD buys, for example, equipment for the cooperatives through its loans from BNDS. As the clearinghouse for the government in the marketing process,ONCAD receives a broker's fee which is paid through the BNDS.

The Peanut Cooperative:

The peanut cooperative was legislated into existence by an executive decree of May, 1960, which outlined their structure and function. Membership of 1,000 CFA francs (*about five dollars*), was voluntary and open to all farmers. These state cooperatives grew out of the agricultural societies (*Societes de Prevoyance*), established in 1919 by the colonial state.[17]

A cooperative does not exist in every village in the district. Darou Karim and Ngabou each had a cooperative. The cooperative has an elected body of officers, including a president, weigher, treasurer, and secretary; and a designated and enclosed (*except for a roof*) place for weighing and storing peanuts until they are evacuated by ONCAD. Many cooperatives in the district were started with the membership being paid by the marabout of the village. Each member repaid the marabout, but this often meant that decision-making weighed heavily in favor of the marabout. The cooperatives are not autonomous, independent bodies acting on their own behalf and in their own interest. Their existence depends on necessary collaboration with ONCAD, whose seccos are charged with the stockpile of peanuts for seeds and the distribution of these seeds each season to farmers through the cooperative. The sale and distribution of

[17] See Marguerite Camboulives, L'Organisation Cooperative au Senegal (Paris: Editions A. Pedone), 1967 for a full discussion of the evolution of the cooperative idea in Senegal. Kenneth Robinson, "The Societes de Prevoyance in French West Africa," Journal of African Administration, 4:29-34, 1950.

fertilizer and agricultural materials is to the cooperative through ONCAD. Each May after the fields are prepared for planting, the farmers obtain their seeds through their cooperative. After this, fertilizer and agricultural materials ordered by members during the previous year's general assembly of the cooperative are distributed. Seed and fertilizer loans are to be repaid in full each season. Loans on agricultural materials are repaid in installments over a three or five year period. The assurance that loans will be repaid is theoretically guaranteed, since money to open the marketing season is not released to the cooperative, by BNDS through ONCAD, if at least eighty percent of outstanding loans are not repaid. Farmers may be unable to sell their crop to their own cooperative, if the latter has no funds with which to open its marketing season.

Between July and September, the rebate from the previous harvest is distributed by ONCAD to the cooperatives. The farmer brings his crop to his cooperative to be weighed. He is responsible for having removed all foreign objects such as sand, pebbles, rocks, sticks, etc. The presence of these objects may be quite by accident or they may be a deliberate attempt to augment the weight of the sacks of peanuts. At any rate, the weight of these foreign objects represents a loss to ONCAD in terms of its commitment to the final buyer. ONCAD must, therefore, ensure against a loss, so that a fixed percentage of the price per kilo is earmarked to cover loss due to the weight of foreign objects. If the total cooperative tonnage contains few foreign objects the cooperative receives a rebate on the fixed percentage earmarked for ONCAD as insurance against loss. The rebate is a debit or credit item for the cooperative in ONCAD's ledger, depending on how clean the cooperative's tonnage is found to be. The rebate is returned by BNDS through ONCAD to the cooperative and distributed to each member by the president according to the size of the individual member's crop. For example, the cooperative may receive a rebate of 200,000 CFA francs *[1,000 dollars]*, which will be distributed to members, the total of whom may be 200. It is at this point more than any other that the true character and spirit of the marketing cooperative is revealed as being a government conduit, rather than an ideological entity in the service of the farmers, and imbued with a spirit of collective effort and sharing. Each member takes his share which may range from, for example, 500 CFA

francs to 2,000 CFA francs. The money distributed on an individual basis cannot possibly have the development impact that it could have, if held and spent in the name of the cooperative body. Alioune Kane stated that he feels the fundamental missing element in cooperative development in rural Senegal is "peasant indifference", in terms of fully grasping and embracing the possibilities to be derived from joint efforts. One reason for this may be the fact that the cooperative idea was not, from the beginning, the spontaneous idea emanating from farmers themselves, but from the desks of national development planners and is viewed by farmers as an organism which belongs to the state. A more fundamental reason is in all likelihood rooted in the political outcome of the confrontation between the socialism of Mamadou Dia and that of President Leopold Senghor, or more simply between the possibility for small improvement and disapproval of this possibility by powerful Mouride leaders.[18] The following situation illustrates the articulation between local and national politics:

Under the 1960 First Republic in the one-party state of Senegal, executive authority was divided between Senghor, the indirectly elected president, and Mamadou Dia, president of the Council of Ministers. Dia interpreted his role as providing him with broad and far-reaching policy making authority, as this role related to economic planning and rural development planning. Operating under this interpretation, Dia restructured the Ministry of Planning to meet his increased need for political resources and authority, in the implementation of his comprehensively centralized rural development strategy. Dia's strategy had at its core a profound rural animation, based on the spread effect idea, where young farmers designated by their village assemblies would enroll in a short consciouness-raising and educational course. Resulting from their sharing and imparting their new enthusiasm, expertise, and knowledge with other small cells, who would in turn kindle a flame of enthusiasm and commitment in an ever-widening network of

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[18] Paul Thibaud, "Dia, Senghor et le Socialisme Africain," in Esprit 31(320), 1963:332-48 discusses the political tensions between Dia and Senghor which led to Dia's political downfall and imprisonment.

small farmers, until every small farmer had been imbued with a sense of responsibility for his own destiny. The government's implementation intent was to begin, first, by totally reorganizing the base of the cooperative movement. However, this notion met its strongest opposition in the form of powerful rural leaders who felt that their leadership and economic base would be eroded under an enlightened peasantry. The power of the Mouride brotherhood very clearly manifested itself in its opposition to Dia's proposals for rural reform. As powerful land owners and merchants, they felt that their economic base would be directly under threat by the proposed attempt to fully incorporate the small farmer into the peanut economy and modify the manner in which he marketed his crop. Senghor, a Catholic and Serer, who had won the political allegiance of the rural Wolof Muslims, when Senegal's political arena spread beyond the original four voting communes of Dakar, Goree, Rufisque, and Saint-Louis, understood the political debt to the Wolof Mourides.[19] Today, many development project ideas are presented to the Khalif-General of the Mourides for his advice and hoped for approval. According to Thibaud (1963:338), Dia met in August, 1962, with marabout leaders to discuss the role of economics and religion in the new Senegal; and since this meeting had been scheduled for December, Senghor seems to have interpreted this August meeting (which found him outside the country) to be a move against him. He then made a trip to Touba to talk with the then Khalif-General, Falilou Mbacke, to ensure the latter's support which meant the beginning of the political downfall for Dia. By December 1962, Dia was

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[19] See the following authors for a detailed discussion of the politics and political actors in the four communes and the events leading to the spread of politics and suffrage to the Senegalese countryside thus enveloping the peasantry whose spokesmen were most often Muslim religious leaders:
G. Wesley Johnson, The Emergence of Black Politics in Senegal, The Struggle for Power in Four Communes, 1900-1920 (Stanford, California: Stanford University Press), 1971; Ruth Schachter, "Single Party Systems in West Africa," in The American Political Science Review, LV, 1961: pp. 294-307; Political Parties in French-Speaking West Africa, (Oxford: Oxford University Press), 1964; Kenneth Robinson, "Senegal: The Elections to the Territorial Assembly, March 1957" in Five Elections in Africa, edited by W. J. Mackenzie and Kenneth Robinson (London: Oxford University Press), 1960:281-390.

arrested and officially charged with attempting a coup d'etat. In 1975, he was released from prison, but the question of whether or not he actually attempted a coup d'etat remains an issue of controversy. What was clear, beyond the shadow of a doubt, was that the rural power base of Mouride leaders, whose structural form emerged from the inevitable transformation of traditional structures during the process of adaptation to Islam and French influences, was influential enough to snuff out the flame that Dia's strategy was to kindle in terms of small farmer consciousness-raising and education. It is important that the significance of this incident be grasped for its importance, as an illustration of the articulation between local level and national politics; between the one-party state and Mouride Islam; and between peasant farmer and Mouride leader. Granted, it is one incident, but it reveals the basic dynamic between local politics and national politics; as well as between the party and the Mourides; and between the small farmer and the Mouride leaders. Markovitz (*1970:92*) presents the argument that access to the government has become institutionalized in the case of the Mourides. Their spiritual control over the rural masses alone is reason enough for the national party to enter mutually beneficial coalitions with them, since a major role they fulfill is in the capacity of communications and implementation centers, which sway opinions and ensure support for party policy and votes. Senghor and the party were not willing to support the Dia strategy, which would have meant alienating Mouride leaders. The political alliance between the party and the Mourides effectively blocks and/or weakens any attempt to move the rural masses more concretely into an ideological and educational position in order to be able to make more responsible decisions about their production and its disposal. So, what remained of Dia's rural animation strategy was a shell or empty organism long on rhetoric and short on action, despite the enthusiastic description of it by Hapgood (*1964*).[20]

[20] See chapters four and five of Edward Schumacher, Politics, Bureaucracy and Rural Development in Senegal, (Berkeley: University of California Press), 1975.

This illustration is certainly not meant to imply, in any way, that Mouride leaders are opposed to change. Their welcome, for example, of the change under colonialism was due to their recognition of it not as a threat, but as an opportunity to consolidate their power base and enhance their economic status. The motor force of their position is the maintenance of the status quo--their concern is to keep their hands on the levers of control as the centers of communication and influences of actual project implementation. Their high degree of adaptability to the influences of modern techniques in agricultural production is clearly revealed in their embracement of SODEVA, the Societe de Developpement et de Vulgarisation Agricole.

The Societe de Developpement et de Vulgarisation Agricole:

SODEVA was created by executive decree in 1968, as the rural development agency for the peanut zones in Senegal. The structure and functions of SODEVA grew out of SATEC, which failed to meet its goals. SODEVA's mandate was to spearhead and guide an increase in the production of peanuts and millet crops; and to train agricultural extension personnel at all levels, who in turn would be responsible for the mass dissemination and demonstration to farmers of technical assistance and counseling. The basic link between the farmer and SODEVA would be through the rural extension worker called a "vulgarisateur" and assigned to a village or contiguous villages in a district. SODEVA is not a revenue-earning agency and its budget comes from the Ministry of Rural and Hydraulic development and international donor agreements, such as the one negotiated with the World Bank in 1968. Though the primary task of SODEVA was to coordinate the implementation of increased intensive agricultural production, by ultimately drawing every district farmer within the network of rural extension training and educational services. Another objective was the establishment of a positive image with Mouride leaders in the district, whose hoped-for embracement of SODEVA would legitimize the latter among small farmers (*Mouride leaders' experience with SATEC was none too positive*). The modern agricultural package includes the following items:

- a seeder (semoir): for sowing
- a plow (houe): for plowing and weeding
- a traction animal: preferably a
- pair of oxen
- a souleveuse: animal pulled light machine for uprooting peanuts from the soil
- fertilizer

This technical package is unquestionably an advance over the traditional technical system, in which the iler or long handle blade functions as a hoe and a plow. Traditional technical exploitation has meant inefficient utilization of land and poor weeding practices. This results in poor production yields. Inefficient utilization of manpower results in the hiring of seasonal harvesters from the Casamance, who are paid a cash sum of money for their services each harvest. It seems that two bottlenecks, at the socio-economic level of rural development, are: (1) poor utilization of the land; and (2) poor utilization of manpower.

SODEVA is a task-oriented organization operating on a cycle of agricultural activities which mesh poorly with those of the small farmer. The farmer's recommended agricultural production cycle is divided into three phases:

Preparation:	January to July
Execution:	June to November
Evaluation:	November to December

The preparation phase from January to July is extremely important and includes both individual and collective demonstration and dissemination tasks. The breaking-in and training of draft oxen, measuring and delimiting of fields, spreading phosphates and the turning of the soil or plowing, are tasks which are best accomplished by the farmer himself with the aid and advice of the rural extension agent or vulgarisateur.[21] This is a

[21] I visited one of SODEVA's centers for breaking in and training oxen to the yoke in February 1977 and found more SODEVA agents there than farmers. Those compound heads who had purchased a pair of oxen had sent a son or other young compound male member to participate in the training sessions.

one-to-one task relationship, since demonstration must take place in the fields to be cultivated. The rural extension worker works side-by-side with the farmer, and the farmer learns from this process. This phase of work does require the physical presence of the farmer who, generally during this period, is engaged in dry-season income-earning activities away from the village. The preparation phase is also a collective task. The vulgarisateur can call a meeting of several farmers at one time, or he can make collective visits to show the farmers how their peanuts should be decorticated. This is extremely important, since the improvement of seed grain is an essential part of an increased yield program. Women have the domestic task of decorticating peanuts and often wet the shell with saliva to facilitate opening or they open the shell with their teeth. This wets the seed. The vulgarisateur counsels against this practice and demonstrates how seeds should be treated with fungicides against insects.[22]

The next task is the preparation of the soil; and here the vulgarisateur goes to the fields with the farmer to show him how to spread the manure. The farmer then demonstrates the care of agricultural materials and equipment--how they should be oiled and cleaned. If parts are missing or need to be repaired, a list is made so that it can be taken care of, before planting takes place. It is now April/May. In May the farmer obtains his seeds from ONCAD secco. The vulgarisateur can observe the manner in which the seeds are opened.

The farmer is now ready to plant his millet, which is done before the first rains fall and the vulgarisateur observes the manner in which this is done. After this task is accomplished, there is the survey of the fields to see whether they are clean; then fertilizer is spread on the fields designated for peanut cultivation. A check is made to ascertain whether the draft animals are fed and healthy. At this point, the preparation

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[22] One of the things which concerned Thierno Sow was the fact that many compounds consumed fairly large amounts of their seeds (this was true for the Fulani compounds also), as part of noon or evening meals when they had no millet and the fungicides could have been harmful.

phase is finished and the farmer waits for the first rains, after which he will sow his peanut seeds. This is the most crucial phase of the agricultural cycle, since it is during this phase that the soil, which is light, sandy, and lacking most nutrients is turned, cleaned, and enriched with manure and fertilizer. For the small farmer, this preparation phase does not ordinarily begin in January and run through June or July. It is, rather, a much shortened activity which generally starts in April/May, and not with the same attention to details recommended by SODEVA. As we shall see in the case of Darou Karim, almost the entire village resides in Touba during the dry season, giving the village a kind of seasonal migratory status. Most farmers, then, return as late as possible, to clean and prepare their fields. The rural extension agent for the village informed me that preparation at Darou Karim is a hurried and haphazard affair; and that extension services to the village are almost totally impossible. These farmers have not perceived any accruing benefit from the curtailment or abandonment of their dry-season income-producing activities in Touba--for the purpose of locking themselves into what amounts to year-round devotion and commitment to farming activities and tasks. Where are the incentives for doing so, especially for a village that experiences a severe water problem after the rainy season? Increased production yields are not guaranteed, even if one spends the entire year engaged in strictly agricultural activities, so that the small farmer continues his usual dry-season strategies for survival. It has not been sufficiently proven to him that the high-risk ecological givens, will be lowered by a commitment to farm-related activities on a year-round basis.

Field Profile: Ngabou:

Drought and Rural Development - The Case of Ngabou III: Ngabou III is a small agricultural village of approximately 188 people. It is a cluster village, in the sense that it is physically part of contiguous units, such as Ngabou I and Ngabou II. These are also officially listed as autonomous villages. The basis of cluster separation is core patrilineages, most of which are linked through marriage alliances to the founding patrilineage of Diouf. These cluster villages were part of the former Wolof client state of Baol, which existed long before Islam became a cultural factor in the area. Ngabou, like other villages of Baol, was ultimately

under the suzerainty of the Djoloff kingdom, which was located much further north in what is now the district of Dahra.

Ngabou III is currently a very poor village, in which only four out of thirty-two compounds farm ten or more hectares of peanuts and millet each. Farm tools and equipment are almost non-existent. Illness among adults and children was frequent and residents were often, literally, in rags.

The tenuous state of agricultural production in the village was strained to the point of near-crisis between 1966 and 1973, when recurring drought years caused extensive damage to the peanut and millet crops. This resulted in a extreme scarcity of food and cash. Dependency on the peanut cash crop, and the ever present scarcity of accessible water resources renders Wolof farmers highly vulnerable to a protracted period of dryness or below average annual rainfall.

At Ngabou, for example, the thirty-two compound heads farm an approximate total of 177½ hectares of peanuts. In 1976 and 1977, their combined yield was approximately 82 tons, which indicates a serious problem of underproduction. Even more serious is the relationship between hectares under millet cultivation and millet production yields. The approximate total number of hectares under millet cultivation was 190 for 1976 and 1977 (*the same number of hectares is cultivated each planting season.* Millet yields have rarely, if ever, been more than one ton per planting except in the case of three of the compound heads. The remainder of the compound heads are obliged each year to purchase millet, beginning as early as March, from shopkeepers and merchants in Mbacke. Prices for millet rise from between 20 and 25 CFA francs in October, to as much as 50 or 55 CFA francs from March right through the millet harvest. The period of hunger, or the soudure, is the time of the year (*dry season*) when the farmer's cash reserves and millet granary are low.

Ngabou is located eight kilometers southwest of Mbacke, which is the administrative seat of the department. This village of thirty-two compounds, which are shallow in genealogical depth and extension, has an approximate total population of 188 people. There are no public services except one primary French school. There is a small shop which sells consumer goods such as coffee, tea, sugar, canned milk, kerosene, ballpoint

pens, rice, etc.; a peanut cooperative, a well, and a mosque. It is situated directly off the main national route, which runs from Dakar to Linguere in the north-east.

The principle occupation is peanut and millet farming with approximately 177½ hectares under peanut cultivation; approximately 190 under millet cultivation; and 30 divided between fallow and traditional vegetables such as sorrel (*bissap*), cowpeas, onions, and peppers. The soil is typically Baol soil; light and sandy with hardly a trace of nutrients.

The staple diet is millet, which is consumed at each meal each day of the year except important religious holidays. Several Diouf households consume rice at noon, which is purchased in the market at Mbacke. Slightly over one-third of the compounds cultivate more than five hectares of millet, yet, not one among them harvests five tons of millet. The average millet yield is around 500 kilos per harvest per compound. It is very difficult, however, to know, with any degree of accuracy, what the millet yield is because as the staple food crop, it goes directly from the field to the granary and is not weighed as are the peanuts.[23] The prevailing experience in the village is the need to purchase millet at a seller's price between March and September.

The village is dependent on one well of 20 to 22 meters in depth. Before the drought, the well was less than 22 meters, but the water table in the Baol has lowered since the drought. I was informed by several wives of compound heads that if the water table should lower again in the future, the drawing of water would then be sought at Mbacke which is eight kilo-

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[23] J. Roch, in his case study of Darou Rahmane II in 1968 has made the same point concerning statistics for the staple food crop. See Maintenance Sociale et Changement Economique au Senegal (Paris: Travaux et Documents de L'O.R.S.T.O.M.), 1972:36; and Olga Linares De Sapir who also discusses the problem of accurately calculating yields for the major food crop of rice in her study of Diola society in the Casamance of southern Senegal in African Food Production Systems, 1970:200.

meters north of the village. Several of these women explained that even then, during the dry season they were going to the well between midnight and five o'clock in the morning to insure a day's supply for the household. This is because the Fulani herdsmen passing through were allowed to use the well to water their herds, in exchange for leaving the herds in the fields to enrich the soil. There is no bore-well for the complex of villages grouped south of Mbacke.

Malaw Diouf takes an active interest in village politics and was the principle lobbyist for the primary school facing his compound, which serves the complex of villages. He informed the researcher that as early as 1960, he addressed himself to the problem of the village's unsure water resources, by speaking on behalf of the village to the political representative for the department of Mbacke. He requested the construction of a bore-well at Ngabou and the representative processed this request through the appropriate channels. In the meantime, a new political representative was chosen and the history of his tenure as the local representative, according to Diouf, was one of mutual disagreement between him and Diouf. Diouf felt that his request for the bore-well was never seriously considered by the new representative, because the two of them disagreed on most issues. He went on to inform the researcher that this request from 1960 did receive a favorable, though verbal, response in 1976, when the marabout Lo, of the village (*Ngabou I*), went to Dakar to see the Minister of Rural and Hydraulic Development concerning a bore-well, and was told that there was definitely to be one constructed in the environs of Ngabou III. The hydraulic situation in Ngabou, as in the rest of the Baol, is by far the most crucial issue to be dealt with by the rural development Ministry, and the biggest technical problem facing rural development implementation agents and the farmer.

The Drought as a Catalyst in Village Exodus: Compound Cases: The drought proved to be a catalyst which radically uprooted a group of Maure farmers from the land which they farmed in Ngabou. This group of Maure farmers had the status of strangers in the village, despite the fact that some of them had been born in the village.

Each household head had small families with no more than two adult males engaged in farming. The land farmed was no more than two to four hectares, thus, their

economic status and livelihood was always of a precarious nature. Their social status in the village was always marginal. Their perceived occupation was that of shepherd or herder for village flocks. Their actual occupation was usually that of part-time farmer and wage laborer in the near town of Mbacke.

As strangers in the village, they did not belong to the prevailing patrilineal networks which serve as institutional safeguards against total impoverishment. The protracted period of dryness and attendant water shortages, crop losses, and heightened food shortages sharply defined the relationship of the strangers to the village. They had no buffers between them and a crisis. Abandonment of farm life was their response to the crisis situation.

These Maure families joined the expanding group of those from neighboring villages seeking wage labor in Mbacke or Diourbel. Though two of the household heads among these Maure families already had one foot in the village and the other in Mbacke, in terms of occupation, it was the drought which pushed them over the economic edge. This resulted in their exodus from the village.

What they did in the town to make ends meet is important. What is more important are the implications of their leaving. At a time when the national government is involved in a strategy to increase the level of agricultural productivity and donor agencies (*such as the Club de Sahel has set forth a program goal for 1979 of increasing the level of agricultural productivity*), villages are losing manpower. It may not seem important within the context of emphasis on appropriately technical-intensive agriculture, as opposed to labor-intensive agriculture; however, in a country in which food shortage is an annual problem, every pair of hands helps.

Another implication of abandonment of the farm life in search of income-producing activities in the towns is that the existing towns cannot support these newcomers. There are few or no jobs for these people. Movement away from the village usually means some alienation from the institutional support system of the kinship network, where food and shelter are part of one's place in a patrilineage.

Compound Profiles: Abdou Dieng is 47 years old. He was a compound head at Ngabou III until 1971, when the family dispersed: some went to Dakar and Abdou; and his immediate family of wife and children went to Mbacke. Abdou works, presently, at the agricultural Service in Mbacke as a janitor and messenger. He sweeps, cleans, picks up the mail and other messages from the post office, and distributes insecticides on the orders of his superiors. He now earns 18,124 CFA francs *(about ninety dollars)* per month. He first started working for the Service in 1957 *(he was not earning the salary he is now)*, having left the four hectares assigned to the Diengs in the charge of his younger brother, Mordienne Dieng. Abdou returned to Ngabou each weekend. The Dieng compound consisted of six households and eighteen members up until 1971. Several drought years jeopardized the brinkmanship existence of seventeen people trying to survive on four hectares of depleted soil. The decision was made by Abdou that Mordienne would seek work in Dakar as a bana-bana or itinerant street salesman of small consumer items such as: pocket radios, sunglasses, pocket calculators, costume jewelry, etc. The income from the peanut harvest was used as the necessary capital needed to make the initial merchandise investment and for transportation to Dakar. At the close of the peanut harvest in 1971, Mordienne left for Dakar and the remainder of the compound moved to Mbacke to the lodgings of Abdou. In 1974, the wife of Mordienne went to join her husband. Leaving with her were her daughter and Belele Dieng, the nineteen year old son of Abdou, who now also works as a bana-bana in Dakar. The fact that three adult males were now employed full-time outside of farming, sharply decreased available manpower in the compound. At Ngabou the compound composition was as follows:

Hut 1:
1. Belele Dieng; 76 year old father of Abdou Dieng (he died during the drought of undetermined causes)
2. Astou Ndiaye; 58 year old wife of Belele and mother of Abdou
3. Fatimata Dieng; 34 year old sister of Abdou by the same parents
4. Buene Dieng; 29 year old sister of Abdou by the same parents

Hut 2:

5. Abdou Dieng; 47 year old compound head

6. Maimona Ndiaye; 40 year old wife of Abdou who died from complications of a pregnancy in 1970

7. Falilou Dieng: 22 year old son of Abdou and (6) who is now an apprentice in mechanics in Mbacke

8. Belele Dieng; 19 year old son of Abdou and (6) who is now a bana-bana in Dakar

9. Awa Dieng; 12 year old daughter of Abdou and (6)

Hut 3:

10. MaDiouf Fall; 49 year old cousin of Abdou (he is the son of Abdou's father's sister)

11. Fatimata Dieng (see #3 above); 34 year old wife of (10)

12. Abdou Fall; 8 year old son of MaDiouf and (11). They had five other children who all died of measles.

Hut 4:

13. Mordienne Dieng; 36 year old brother of Abdou by the same parents. He is now working in Dakar as a bana-bana.

14. Norgaye Fall; 26 year old wife of Mordienne (13)

15. Banena Dieng; 6 year old daughter of (13) and (14)

Hut 5:

16. Mariame Dieng; dead since 1957

17. Sadat Fall; 28 year old son of the daughter of (16)

18. Omar Fall; 24 year old son of the daughter of (16)

Hut 6: 19. Decouma Dieng; 39 year old sister of Abdou by the same parents

20. Ahmette Babou; 55 year old son of Abdou's father's sister. He is divorced since 1957.

At Mbacke, the compound population ration decreased from seventeen people to ten people, who are living in one thatched roof hut and a clay structure of three rooms. The land belongs to a large land holder in Kael and Abdou pays rent to this man. He constructed the dwellings on the property in 1962. He and his wife and daughters share the thatched roof hut and the other members share the three rooms.

There is no longer any cultivation by the Diengs at Ngabou. They maintain their tax status there which entitles them to receive seeds each seasons, but they have had to seek land elsewhere. Abdou claims that he could return to Ngabou, if he wished. Malaw Diouf stated that the land abandoned by the Diengs reverted back to the Dioufs, who have since reassigned it. The reality is that for all practical purposes, the Diengs have joined the landless group of uprooted farmers at Mbacke. Dieng's view of the family situation showed a bit more optimism than the reality indicates, when he stated:

> "Ngabou is no longer a good place to farm because there is no longer water, fruit trees, or wadis. I left my tax inscription at Ngabou because the village may take on life again one day. This life here at Mbacke is not seen as a permanent life since we all would rather be back at Ngabou. I would prefer to be where my parents were. I am here because I am poor and cannot remain in the village of my birth" (Interview, October 1976).

Abdou's grandfather left Touba Madina in the department of Kebemer, in 1914. He was a nomadic camel transporter, who passed through Ngabou each year during the dry season. In 1914, he decided to remain in Ngabou and went to the village chief to request a plot of land, which was given to him. During the rainy season, he grew peanuts and some millet; and during the dry season, he resumed his occupation of itinerant transporter and shepherd for the village

livestock. Abdou inherited the goats and sheep which had increased in number, as a result of the tradition that gives every third animal born to the shepherd. In Ngabou, at one point, the Diengs owned about thirty goats and a few sheep. This dwindled to zero over the years, especially during the drought years through sale and as food for relatives. The animals were raised for their milk, rather than for sale; the milk being a direct consumer product, as well as an exchange commodity for millet with neighbors.

At Ngabou, the Dieng compound consumed only millet (*six kilos per day*). The compound did not grow enough millet to last from one harvest to the next, but with the milk from their goats they made an exchange of a small calabash of milk for the same size calabash of millet. In Wolof this is called bathia-bathia, which translates as recipient full-recipient-full. The compound harvested an average of one ton of millet each year, which was not sufficient when one calculates that six kilos of millet is consumed every day of the year, except for big religious holidays such as Tabaski. According to Abdou, millet was never bought commercially when they lived at Ngabou, since the exchange of milk for millet helped them through the season. Millet was not necessarily exchanged only in the village of Ngabou. Neighboring villages or the cluster villages would exchange millet for milk. The dependence on the milk/millet exchange proved disastrous during the drought, when neighbors had no millet to exchange and livestock were sold for food or cash or died due to the lack of water and grazing grasses. Abdou pointed out to me that his family had traditionally belonged within the herding occupational group, though they never owned large herds and that farming was adopted when his grandfather came to Ngabou. Herding and farming are more than occupations, they are also cultural identity badges which define ethnicity and behavioral norms. The Diengs never really fit into either category, having been on the periphery of each occupational group in terms of the basic resources characteristic of each occupation, namely: land or livestock holdings. Their ideological link to livestock-raising is maintained through an economic commitment to the purchase (*over a period of several years*) of three cattle, which they have confided to a herd in a neighboring village.

Abdou stated that he heard of the cattle fattening "embouche bovine" program of SODEVA, long after he had personally decided to have one of the cattle

fattened for sale. For SODEVA, his withdrawal from the agricultural economy represents the loss of a potential demonstrator, in the sense that his experience with this activity could have been exploited in encouraging others to participate in it. Abdou's position was that it was of no interest to him to have a pair of draft animals, because he never had enough land to justify such an investment. His feeling was that even without the draft animals, he had not really done too badly in terms of peanut farming except during the drought years. The following figures provided by him cannot be considered totally on target, because of the lack of an accounting system, but can provide some idea of the return on his investment in peanut farming. Based on conversations with other compound heads and SODEVA agents, the figures do not appear unreliable:

Peanut Production

Year	Planted	Harvested	
1960	200 kilos	4 tons	
1961	200 kilos	3 tons	
1962	200 kilos	4 tons	
1963	115 kilos	1½ tons	(Abdou was ill during this season)
1964	115 kilos	1½ tons	(He was still ill)
1965	250 kilos	5 tons	
1966	250 kilos	2 tons	
1967	400 kilos	900 tons	
1968	400 kilos	no harvest - lost the crop due to poor rainfall season	
1969	100 kilos	700 kilos*	
1970	300 kilos	no harvest - lost the crop due to poor rains	
1971	150 kilos	no harvest - lost the crop due to poor rains	

*Abdou was unable to repay ONCAD at the end of the 1968 season because he had not harvested a crop large enough to do so. The peanuts he did salvage from the harvest were eaten by the family. This meant that for the 1969 season he received no seeds from ONCAD and borrowed the ones he did plant.

the yearly income of a large number of farmers in the district) to creditors in Mbacke in 1976; and stated that his debts were increasing. He explained that this is due to the life in the town, which had created the extra burden of visiting relatives who come from the village looking for work, bed and board with him. During the rainy season, the compound consumes three kilos of millet each day; and five kilos during the dry season because of the influx of relatives to Mbacke. Millet is bought at the end of each month by the fifty kilo bag, and when this runs out Abdou buys millet on credit. He has a specific merchant with whom he deals and has a balance of 15,000 CFA francs each month (*he pays interest of 100 CFA francs for every 500 owed*); and he pays 10,000 CFA francs on his outstanding bill at the end of each month. The remaining 8,000 CFA francs of his salary is given to another merchant at Mbacke for the daily consumer purchases his wife makes for meals and other household necessities such as tea, sugar, oil, kerosene, etc.

Several of the families I followed from the village to town changed their consumption habits and altered their lifestyle. In addition to hosting more relatives at Mbacke than they did at Ngabou, the Dieng compound for example, now eats rice at noon. Rice is, of course, more expensive than millet. On several occasions I heard the comment that "it is the true peasant who eats millet at noon. In town one eats rice." During the rainy season in the Dieng compound, 1½ kilos of rice was eaten and during the dry season, especially the months of February through April, the compound consumed 4 kilos of rice and 1½ kilos of cooking oil. Mordienne and Belele come every two or three months from Dakar to help regulate the problem of debts, but Abdou stated that "I will always have debts to feed my family and see no way of ever being rid of these debts accumulated in Mbacke."

Indebtedness and Urban Living: The drought not only hastened Abdou's inevitable rendez-vous with economic disaster and made him a member of the growing landless population in town, but also contributed to his heavy indebtedness. As far as rural development is concerned, it is doubtful that Abdou Dieng will ever be a producer again in a country where the development of the rural economy is the most important issue, if endemic food shortages are to be dealt with. The growing numbers of people forced to abandon the land and come to town is a problem faced by SODEVA in the

Seed Debts: The drought years presented the small farmer with more than the climatic problem of not enough rainfall. A direct by-product of this situation was the inability of vast numbers of small farmers to repay their seed debt to ONCAD, which compounded their problems for the next planting season, since the outstanding debt either reduced or totally wiped out their allocation quota for seeds. The Diengs were able to hang on by borrowing seed for three years, after which the situation became untenable. From 1972 to 1975, Abdou gave his seeds to MaDiouf Fall, the husband of his sister, for planting at Mbacke; but MaDiouf had no success with the crop. In 1976, Abdou gave his seeds to another brother-in-law, Usainou, who planted at Touba Belel, where Usainou had an older brother.[24] Each rainy season Usainou moves to Touba Belel, where he does the planting for the Dieng compound. He also works as a navatane at Touba Belel during this period. During the dry season he works in Mbacke, selling meat on skewers (*cooked or raw*) by the kilo. Usainou harvested 1½ tons of peanuts in 1976. This brought in some cash, but life had changed drastically in Mbacke from what it had been in Ngabou. Abdou stated that during the drought, he did not sell any of his farm tools to buy food (*he sold animals instead*). He confided these tools to another nephew at Darou Mousty. He bought a seeder in 1957, for 6,000 CFA francs (*about thirty dollars*) and all other tools he needed were borrowed from the Agricultural Service as he needed them. While he did not sell any of his farm tools for food, he did go deeply into debt in 1968 (*since he had a salaried job he was considered by merchants in Mbacke to be a good credit risk*), when he lost both his millet and peanut crops. He informed the researcher that before the drought, he had no heavy debts like the ones he has now. He owed 50,000 CFA francs (*about two hundred-fifty dollars and more than*

[24] A prevalent phenomenon in the district of Ndame is that increasing numbers of farmers farm land at Touba Belel or some other village outside the densely populated villages in the district. This is because patrilineal inheritance can no longer meet the needs of an increasing population in these Baol territories which are densely populated. Olga Linares De Sapir found this same phenomenon among the Diola in the Casamance in southern Senegal; see "Agriculture and Diola Society," (1970:193-227).

implementation of its strategy. To further document this problem, the researcher profiled two other compound families who left Ngabou and now reside in Mbacke.

The MaDiouf Fall Household: MaDiouf Fall is a cross-cousin of Abdou Dieng and the husband of Abdou's sister Fatimata Dieng. He is 49 years of age and was also born in Ngabou. His father and mother were born in Mauritania. His father was an itinerant livestock salesman who decided on one of his yearly dry season trips to Senegal to remain in the country. He settled in Ngabou. MaDiouf says that he is a farmer, but his principle occupation has always been as a porter--transporting either on his head or by cart. At Mbacke, he transports all types of merchandise for various wholesale houses.

MaDiouf was not a compound head at Ngabou. He was a household head in the compound of Abdou Dieng. It is very common to find the son of father's sister a member of father's compound (*MaDiouf is the son of Abdou's father's sister*). The household of MaDiouf at Ngabou consisted only of his wife and one eight year old son. Five other children had died of measles over several past seasons.

At Ngabou, MaDiouf farmed 1½ hectares of peanuts and 1 hectare of millet. Each dry season he went to Mbacke to work as a porter by the day. In 1971, he harvested no crop on his total of 2½ hectares and decided to abandon the land and move to Mbacke. He moved into the same neighborhood as Abdou Dieng. Again, the drought was the determining factor in pushing him from the land where he was barely scratching out a meager living. He had neither the land nor, more importantly, the manpower needed to confront a crisis, so he decided to extend his dry season occupational activity to the rainy season. This meant abandoning the land. This elementary unit was entirely too small and fragile to address the drought situation, as some large extended families in the district were able to do by: attempting variations within the two farming systems of peanuts and millet, sending junior adult males to seek work during the dry season, or riding out the crisis in the home of more comfortable relatives.

The household has increased at Mbacke where MaDiouf rents one room in the compound of distant

relatives and is composed of the following members:

1. MaDiouf Fall; 49 year old compound head
2. Fatimata Dieng; 34 year old wife of MaDiouf
3. Maimouna Fall; 5 year old daughter of (1) and (2)
4. Adama Fall; 3 year old son of (1) and (2)
5. Astou Fall; 10 month old daughter of (1) and (2)

The consumption patterns have altered slightly in this compound, since the family now occasionally eats rice at noon. At Ngabou, they consumed only millet and milk. Unlike Abdou, MaDiouf is not able to purchase millet in large quantities at once. He buys millet daily from a merchant in Mbacke for cash, because he cannot get credit. He is considered too much of a credit risk, since he has no steady employment or land. The only credit or debt that he has is for his yearly allocation of seeds. He is still able to receive seeds each season, because he continues to pay taxes at Ngabou.

During the rainy season the compound consumes two kilos of millet daily and one-half kilo of rice. During the dry season three kilos of millet and two kilos of rice are consumed due to the presence of relatives coming in to Mbacke seeking work and passing periods of time with the Falls.

MaDiouf leaves in the morning to make enough money for the evening meal; comes home around one-thirty in the afternoon for the noon meal; then leaves again in the afternoon to make enough for the noon meal of the next day. During the rainy season he gives his wife 100 CFA francs (*about fifty cents*) to purchase two kilos of millet; 100 CFA francs for vegetables; and 110 CFA francs for rice. She has a total of 500 CFA francs for a day's meals and with the remaining 190 CFA francs she buys wood, cooking oil, sugar, tea, etc. Fatimata Dieng stated that "it is only the comfortable who can afford to buy millet and rice in large bags by the month. We live from day to day."

MaDiouf generally earns 600 francs per day. On days when he earns 1,000 CFA francs, he buys two

kilos of meat in Mbacke. While he feels that he has a much better chance of feeding his family in Mbacke than he had during and after the drought at Ngabou, he stated that his intentions were to return to Ngabou as soon as the time was propitious. When asked why he would want to return to Ngabou, he stated that he has a sentimental attachment to the village of his birth, and that he continues to pay taxes there to maintain his links with the village. This may very well be true, but the economic reason of seed allocation rights as long as taxes are paid is the overriding factor. In 1976, MaDiouf received 60 kilos of seeds which were planted by a relative, Usainou Fall, at Touba Belel. The harvest was 600 kilos of peanuts. As for returning to Ngabou, the chances are indeed slim since the land MaDiouf farmed reverted back to the control of Malaw Diouf. MaDiouf did mention that when he abandoned the land he knew that he would probably not be able to find land in Ngabou, should he wish to return.

The Demba Sy Compound: Demba Sy is 43 years old and was a compound head at Ngabou until 1973, when he and his family moved permanently to Mbacke. He first moved to Ngabou from Taibe Mutoufur in the Diourbel region in 1961. He chose Ngabou, because he had relatives there. His father was a Mauritanian, born in Dagana in the Senegal River valley region and made his living as an itinerant shepherd. Demba did not follow in his father's occupational footsteps. Instead, he has always farmed and worked odd jobs during the dry season *(usually more work at odd jobs than at farming)*. At Ngabou, Demba farmed a total of 1½ hectares of land adjacent to the land of his relatives at Ngabou. The households surviving on these 1½ hectares consisted of the following members at Ngabou:

Hut 1:
1. Demba Sy; 43 year old compound head
2. Youema Fall; 32 year old wife of Demba

Hut 2:
3. Sede Sy; 28 year old son of an older sister of Demba
4. Yarga Sy; 21 year old son of Demba

Demba, Sede, and Yarga planted and harvested in the following manner:

Peanut Production		
Year	Planted	Harvested
1961	80 kilos	1 ton
1962	80 kilos	1½ tons
1963	80 kilos	1½ tons
1964	80 kilos	895 kilos
1965	80 kilos	700 kilos
1966	80 kilos	600 kilos
1967	80 kilos	no harvest - lost crop
1968	-0-	-0- (had no seeds to plant)
1969	-0-	-0- (had no seeds to plant)
1970	-0-	-0- (had no seeds to plant)
1971	-0-	-0- (had no seeds to plant)
1972	-0-	-0- (had no seeds to plant)

During the dry seasons throughout these years, Demba worked in Mbacke as a porter or carrier of sacks and other heavy items for various wholesale houses. Finally in 1973, he got a job at the Prefecture (*the administrative headquarters for the department of Mbacke*) as a yardman and water porter. He also waters the flowers and the lawn. His salary is 19,421 CFA francs per month. After landing this job Demba decided to move his small family to Mbacke. At Mbacke, there is only Demba and his wife. Sede has a job in a factory in Dakar and Yarga lives in Diourbel and works in the local market where he sells fish. Demba rents one room not too far from Abdou Dieng for 1,000 CFA francs per month. At Ngabou, the Sys ate only millet prepared dishes, but now at Mbacke they eat rice at noon and Demba has established credit with a Lebanese merchant, where he buys his millet and rice on credit. Demba has always bought millet for most of the year, because even when he farmed millet on the ½ hectare at Ngabou, he never reaped more than 400 kilos per season. He pays 600 CFA francs for every 500 borrowed. Demba and his wife and whatever guests they have at mealtime consume three kilos of millet and one kilo of rice per day. He buys 20 kilos of millet each week and 10 kilos of rice. They have tea three times a day using 250 grams of sugar and 75 grams of tea each preparation. Each month he pays between 6,000 CFA francs and 7,000

CFA francs on his outstanding bill. With the remainder of his salary, he purchases the other items he and his wife might need. Like Abdou and MaDiouf, Demba still pays taxes at Ngabou in order to receive the seeds, but unlike them, he has no interest in returning to the village. He feels that at Mbacke he can survive and support his wife.

Exodus and Social Security Safeguards: One of the major problems faced by development agents in the peanut zones, especially SODEVA, is the permanent exodus of adult males from the land. Those most prone to abandon the land permanently and take their chances in the towns are the small families with one or two adult males trying to eke out a living on one or two hectares of land. The three families profiled here have now joined a growing number of a rootless population at Mbacke and simply represent the vanguard of an increasingly fragile farming population. This population has been subjected to increasing land shortages coupled with often unrealistic rural development strategies. The ecological situation is, of course, a given which calls for technical solutions.

These pressures on small farmers have occurred within a social system that had traditional safeguards against complete destitution, in the form of the lamanat, patrilineal inheritance, and socio-economic obligations across stratification lines. The increasing population in the Baol has strained the lamanat, resulting in the fragmentation of land holdings to the point that a household head can end up with one or two hectares. At Ngabou, it was becoming fairly common to find the younger married males of a compound, leaving their plots in the care of an older brother while they sought work in the towns. This was considered more profitable than trying to make a living from one or two hectares. These people can leave the land without abandoning it, since they are within the system of the lamanat. 'Strangers,' on the other hand, are faced with the problem of being outside the lamanat of a village, in terms of kinship which has natural safeguards of social security. These 'strangers' are therefore exposed to the sharp edge of a new reality of impoverishment in the face of a crisis. As secure as the lamanat may seem, there are deepening cracks in its structure. Traditionally, it was not possible to alienate the land through sale, contract, or gift and outright alienation of land was discouraged. This is no longer the case since the alienation of land at Ngabou, by receiving a pledge of cash, has taken place for a number of years. Obviously, the fact that poverty-

stricken lamanes have pledged land (*which would ideally be retrieved if the pledge was repaid*), seems to indicate that the traditional lamanat structure is crumbling around the edges.

It may be said that a structure can be in a state of disintegration over many generations. However, since social structures within social systems are made up of people, they really undergo a re-structuring rather than a disintegration. This restructuring may be in a form totally different from its original form, but the process and the people who make the process happen are as important, or more important, than the actual form itself. The lamanat and patrilineal inheritance can no longer cope with the population in the Baol and the differential growth of compound households, so that there are ways of coping with this problem of land. The lamanat and patrilineal inheritance are essentially concerned with land rights, but they also represent a set of socio-economic obligations which protect each member. The most important strategy utilized by families during the drought at Ngabou was the reliance on, exploitation of, and dependence on safeguards built into the traditional system of social organization and social obligations. This same finding has been documented by Mbithi and Wisner in their 1972 study of drought and rural development in Kenya. It is this which serves as a buffer between the small farmer or herder and total destitution during a crisis situation.

Some Social and Economic Problems of Agricultural Production As Seen Through Compound Profiles: Some of the compound families are profiled here as representative of some of the social and economic problems of agricultural production in the village. The production activities, behavior, and attitudes of the productive members toward farming cover a range of problems and responses to the environment.

--The MaDiop Fall Compound: Interest In A Threshing Machine: MaDiop Fall is the leader of a group of compound families who live in a section of the village of Ngabou. They all belong to a religious group known as the Baye Fall and owe their allegiance to the founder, Shaikh Fall. He is 55 years old and came to Ngabou at 10 years of age, with his father who was a talibe of Shaikh Fall. His father came to Ngabou on the orders of his marabout. MaDiop is among the farmers with the largest landholdings and largest families at Ngabou. He farms twenty-four hectares of peanuts and millet each

year on land inherited from his father, through the marabout Serigne Salilou Fall. His family consists of the following members:

Hut 1: 1. MaDiop Fall; 55 year old compound head

Hut 2: 2. Oume Gueye; 40 year old first wife of (1)

3. Fama Fall; 5 year old daughter of (1) and (2)

Hut 3: 4. Boussa Fall; 20 year old second wife of (1)

Hut 4: 5. Mordou Fall; 24 year old son of the younger brother of (1)

6. Saye Fall; 18 year old wife of (5)

7. Mordou Fall; 1 month old son of (5) and (6)

Hut 5: 8. Falilou Ying; 26 year old son of a younger sister of (1)

9. Sohkna Sene; 17 year old wife of (8)

10. Mahmar Ying; newborn son of (8) and (9)

Hut 6: 11. Ndiarga Fall; 22 year old son of (1) and (2)

12. Mordou Fall; 17 year old son of (1) and (2)

13. Amadou Fall; 15 year old brother of (5) by the same parents

14. Aliou Fall; 12 year old brother of (5) by the same parents

Hut 7: 15. Penda Ndiaye; 80 year old mother of (1)

Land for peanut and millet farming is divided in the following manner:

Peanut Cultivation	
Compound Member	Hectares
MaDiop (1)	6
Mordou (5) Amadou (13) Aliou (14)	2
Ndiarga (11) Mordou (12)	2
Falilou (8)	1½
Boussa (4)	½
8 laborers	12

Millet cultivation is divided in the same manner, the only difference being that the yields are communal. These eight people engaged in the agricultural tasks use two seeders, two ilers, and two souleveuses. They have no carts for transport of water or manure to the fields or to remove weeds from the fields. In 1976, they were using a hand-made basket to transport manure to the fields. There is not really that much manure to transport, since the compound has only two horses, three sheep, and two chickens.[25] Ndiarga and MaDiop have clearly accepted the efficacy of manuring the fields, but differ on whose fields should be manured. Since Ndiarga is the unmarried son of MaDiop and remains in the compound, he has the status of surga and his fields are referred to as one of the "surga fields." MaDiop pointed out that there was not enough manure to spread, since it is he who has the ultimate responsibility for daily expenses and therefore needs the most abundant harvest. Ndiarga's point was that it was he and the other surga who bring the manure to the fields, but, unfortunately, could not benefit from it. He did not relate this opinion in front of his father, however. MaDiop feels that if the compound owned

[25] In the discussion of whether the compound families here would be interested in poultry raising as an income-producing activity, the compound heads and their wives pointed out that traditionally they have given chickens as gifts to their marabouts and did not think they could seriously commit themselves to raising chickens for eggs and for sale.

a cart they could transport manure from outside the village.

Except for the two seeders, the Falls are using no modern farm tools (*the ilers and souleveuses were fabricated by a blacksmith in the village*) and no modern techniques. Despite a long discussion about the manure, it is a very small amount and used haphazardly. Their farming methods coupled with the poor quality soil and problematic rainfall give them consistently poor yields. In 1976 and 1977, MaDiop planted 300 kilos of peanuts and reaped 5 tons and 6 tons, respectively. The compound's 12 hectares of millet normally yields between 3 and 3½ tons, which does not last from one harvest to the next. MaDiop stated that "sometimes I have to buy 100 or 200 kilos of millet once or twice a month until the next harvest." Ndiarga pointed out that less time is spent weeding the millet fields since the peanut crop is more important.

The MaDiop Fall family was among the families most interested in mechanized machinery to aid them in the production process. One of the 'lively interest' discussions floating around the district concerned the threshing machine available on a limited basis to "very responsible" farmers (*usually marabouts with large parcels of land and large harvests of millet*) to aid in the harvesting of millet. The machines were fairly experimental and available through SODEVA.[26] The marabout Serigne Lo, at Ngabou had access to this machine during the time the interviews were conducted in the Baye Fall section of the village. The compound heads and women of the compounds were enthusiastic about the possibility of having access to the threshing machine, since it would considerably reduce their work load. Actually, the threshing machine would not benefit the compound heads themselves, since the millet variety has not been perfected to the point that it will grow uniformly and can be evenly cut on a mechanized basis. The millet would still have to be cut in the traditional manner with short handled knives and then hand-fed

[26] On a visit to the agricultural experimental station at Bambey, I saw on display one French made and one Italian made model of a threshing machine. Bambey technicians have also custom designed a model for Senegal.

into the thresher. Utilization of the machine would directly affect the women and the surgas: the women because it is they who now do the winnowing; and the surgas because it is they who construct and repair the granaries, as well as actually press the harvested stalks into the granaries. The compound heads stated that they would be willing to forego their rebate from ONCAD for the peanut harvest, as an initial payment toward the purchase of a threshing machine (*the price quoted me was in the 200,000 CFA franc range*). The surgas, however, felt that the machine would not benefit them, therefore, they saw no reason to forego their rebate. The surgas felt that the machine would be monopolized by the officers of the peanut cooperative. The compound heads felt that the surgas were being stubborn, since the machine would relieve them of several tasks. The response of the surgas was based as much on a fear of the machine alienating them from their traditional tasks, as it was on their perception that the machine belonged to the millet culture. The millet culture is not as important to their livelihood as is the peanut culture, where they can exercise some individuality in terms of disposal of their harvest. The interrelation between the two farming cultures is not appreciated by all farmers, and this was underscored by Ndiarga who informed me that he saw no reason why his rebate should be pledged toward a machine that had nothing to do with relieving his tasks within the peanut production system.

Most of the villagers have seen the threshing machine at work and have manifested enough interest in it for Malaw Diouf to make some initial inquiry into possible access to village use or purchase of the machine. In June 1976, he and other members of the peanut cooperative called a special cooperative assembly meeting with representatives from ONCAD, to discuss the possibility of purchasing, on credit, a threshing machine in the name of the village marabout. A formal request was processed and went through the department, then the regional ONCAD office. In the cooperative's general assembly meeting, held in January 1977, the members were informed by the ONCAD representative that their request to purchase a threshing machine in the name of an individual would not be accepted, but that they could pursue the possibility of purchasing the machine through the cooperative, provided they understood that their yearly rebate would be pledged toward the first installment. The rebate would not completely cover the first installment, but would at least be a sum to open negotiations.

Interest in the threshing machine is an indicator of the hope that these farmers have in their commitment to sustaining themselves on the farm. This does not blot out the bleakness of the present, nor the immediate future.

The Cheikh Sene Compound: Lack of Farm Tools and Rental as a Solution:

Cheikh Sene is a 35 year old compound head who was born at Ngabou. He farms a total of seven hectares, divided equally between peanuts and millet. The land was assigned to him by his older brother Ndiarga Sene who also lives at Ngabou. Cheikh belongs to the cluster unit of MaDiop Fall. His family consists of the following members:

Hut 1.
1. Cheikh Sene; 35 year old compound head. He is divorced.
2. Abdou Lahat Sene; 19 year old brother of (1) by the same parents

Hut 2.
3. Faty Diop; 50 year old mother of (1)
4. Sohkna Sene; 22 year old sister of (1) by the same parents
5. Diarda Sene; 8 year old sister of (1) by the same father

Hut 3.:
6. Maty Mbaye; 70 year old mother of (3)

Land for peanut and millet cultivation is divided in the following manner:

Peanut Cultivation

Compound Member	Hectares
Cheikh (1)	2
Abdou (2)	1
Sohkna (4)	¼
Diarda (5)	¼
4 laborers	3½

The 3½ hectares of millet cultivation is divided in the same manner. These four people engaged in the agricultural

tasks are not as fortunate as their neighbors. Cheikh does not own a seeder. He rents one each planting season from a merchant in Mbacke for 2,000 CFA francs. He has no plow (he uses the traditional iler), no souleveuse, and no cart. He does own one horse, four sheep, two goats, and four chickens. Abdou hand-carries some very small amounts of manure to Cheikh's fields, but since this is done on such a non-consistent basis and no fertilizer is used, Cheikh's harvest is always small.

Unlike the Maure enclave, which had no choice but to abandon the land due to their fragile human and land resources in the face of drought, Cheikh, whose resources were as fragile as those of the Maures, had social security of membership in a network rooted in the traditional lamanat; and overlaid by the patron-client structure of the marabout-talibe relationship. He was insured against total improverishment, because of the institutional safeguards of the syncretic traditional and maraboutic structure. Neither Cheikh nor Abdou Lahat has an income-producing activity during the dry season. The safeguards of the traditional and maraboutic structures are, for the present, camouflaging the desperateness of Cheikh's economic situation. The slightest pressure point such as: another protracted period of dryness; a severe drop in the producer price of peanuts; or further fragmentation of the Sene land-holdings could throw into much sharper relief as to how close to the edge of destitution Cheikh lives. His situation has all the characteristics and indicators which would push a small farmer to abandon the land.

The Ndongo Ndiaye Compound: The Social Security of the Kinship Network and Wage-Labor as a Solution:

Ndongo Ndiaye is a young compound head of 23 years of age. He was born at Ngabou and so was his father who is a paternal cousin of Malaw Diouf. His great-grandfather was among the founding group of Ngabou. Ndongo's father was a farmer at Ngabou and so is N'dongo, yet, it is with difficulty that he farms at all since he, like Cheikh, has almost no tools, no work animals, and uses neither manure nor fertilizer on his fields. He does have a cart but no animal to pull it - he has neither a horse nor a donkey. He nas five sheep and eleven chickens. He borrows the seeder, plow, and souleveuse from Mbacke N'diaye, an older brother who

lives in the compound. N'dongo's compound consists of the following members:

Hut 1:
1. N'dongo N'diaye; 23 year old compound head
2. M'bene M'bodj; 20 year old wife of (1)
3. Diakhou N'diaye; week old daughter of (1) and (2)
4. Ousseinou N'diaye; 4 year old son of (1) and (2)

Hut 2:
5. Diakhou N'diaye; 55 year old mother of (1)

Hut 3:
6. N'gone N'diaye; 19 year old sister of (1) by the same parents
7. Fallou Seck; 3 year old son of (6) and her husband Abdoulaye Seck who lives at Mbacke and works as a bana-bana or itinerant salesman

Hut 4:
8. Kine N'diaye; 15 year old sister of (1) by the same parents
9. Lisoune N'diaye; 13 year old sister of (1) by the same parents

Hut 5:
10. Sohkna N'diaye; 70 year old sister of the father of (1)
11. Penda Diouf; 16 year old daughter of the son of (10)
12. N'deye N'diaye; 3 year old daughter of (11)

Hut 6:
13. Mbacke N'diaye; 37 year old brother of (1) by the same parents. He is in poor health.
14. Mariama Dieng; 16 year old wife of (13)
15. Diakhou N'diaye; 4 year old daughter of (13) and (14)

These fifteen people are surviving on a total of nine hectares, five of which are cultivated in peanuts and the other four in millet. The land is divided in the following manner:

Peanut Cultivation	
Compound Member	Hectares
N'dongo (1)	3
Diakhou (5)	1
M'bene (2)	1
3 laborers	5

N'dongo informed the researcher that he did not use manure on his fields, because he had no way of transporting it to the fields; since he has no horse or donkey for his cart; and because he does not know how fertilizer will improve his crop. In 1976, N'dongo's peanut yield was 900 kilos; and in 1977, it was 500 kilos. His milet yield for 1976, was one ton and in 1977, it was 500 kilos. His family consumes five kilos of millet per day and since his harvest does not begin to suffice from one season to the next, he starts to purchase millet by the day in April. N'dongo's ace-in-the-hole, for the moment, is seasonal work in the peanut oil processing plant, in Dourbel, where he passes the dry season *(except for the frequent weekends back to Ngabou)*. This job is very recent to the time of this reporting. He started on it in February 1976. Before that he worked in the Forestry Service as a janitor, but was laid off. N'dongo's economic situation is also very precarious, but again, he has the social security of the safeguards, built into the traditional lamanat with its attendant social obligations. His situation is less dependent on the maraboutic patron-client relationship that was discussed in connection with Cheikh Sene.

The Fragility of Social Security Under the Kinship Network:

Though the lamanat still serves as a buffer between the small farmer and total destitution, it is showing signs of fragility and crumbling around the edges. This is illustrated by the following compound profiles.

The M'baye Diouf Compound: Land Alienation:

M'baye Diouf is a 45 year old compound head, who was born at Ngabou. His father and the village chief were parallel cousins. M'baye's father died when M'baye was very young and his father's land came under the stewardship of the village chief. According to M'baye, when he became of age to assume stewardship over the land, that he felt was rightfully his, he found out that the chief had pledged the ten hectares for a cash sum, which was never repaid to the lender who then claimed the land. M'baye attributes his poverty to what he termed the chiefs "lack of respect for the old system of land rights." In effect, the chief alienated family land which was left under his stewardship, through what amounted to an outright sale. This is the situation of "mettre en gage" discussed by Pelissier (*1966:130*). M'baye supports his family on sixteen hectares, seven of which are for peanuts and the other nine for millet. The compound composition is as follows:

Hut 1:
1. M'baye Diouf; 45 year old compound head
2. M'bene Sarr; 22 year old wife of (1)
3. Ami Calle Diouf; 2 year old daughter of (1) and (2)

Hut 2:
4. Abdou Khadir Ba; 23 year old son of the sister of (1)
5. M'beye Ba; 19 year old brother of (4) by the same parents

Peanut and millet cultivation is divided in the following manner:

Peanut Cultivation

Compound Member	Hectares
M'baye (1)	3
Abdou (4)	2
M'bene (2)	1
M'beye (5)	1
4 laborers	7

M'bene does not have a millet plot. She works in the millet fields of her husband. M'baye informed me that he plants more millet than peanuts only because he can only get from ONCAD seeds for seven hectares.

The 1976 peanut harvest was 4 tons and in 1977, it was 4½ tons. The millet harvest has always been small, never exceeding one ton. M'baye is concerned that his yields are low, but is hard pressed to commit himself to the SODEVA program. He has purchased a seeder, plow, and souleveuse; and for the first time, in 1975, he purchased 300 kilos of fertilizer. His only animals were one horse and one chicken. He had purchased a cart but sold it in 1975, when he needed money for the negotiations and dowry of his present wife, M'bene (*his first wife died in 1973*).

During the dry season, Abdou and M'beye picked up between 400 CFA francs to 900 CFA francs per month as chauffeur apprentices in Mbacke. M'baye was a tailor in Mbacke, during the dry season, until 1974, when he abandoned the occupation because he needed cash so badly that he sold his sewing machine. The selling of any type of farm or domestic machine was rampant in the village, but not openly discussed by everyone.

The Moustapha Sall Compound: Land Alienation and Petty Trade As a Solution:

Moustapha Sall is a 55 year old compound head, whose father and grandfather were born at Ngabou. He now farms a total of 6½ hectares, with 7½ in fallow; but his father had farmed 24 hectares, 10 of which have been given to one of the marabouts as a gift. Moustapha has an older brother in another cluster unit called Thientche, whose land was inherited from his mother's brother. Moustapha stated that though he was loyal to his marabout he did not totally agree with giving them land "which increased their wealth while we get poorer and poorer." Moustapha's family is small and, considering his lack of farm tools and animals, the 6½ hectares he farms is no small challenge. His family composition is as follows:

Hut 1: 1. Moustapha Sall; 55 year old compound head

Hut 2: 2. Awa Sall; 35 year old wife of (1)

Hut 2:

3. Maram Sall, 16 year old daughter of (1) and (2)

4. N'deye Sall; 9 year old daughter of (1) and (2)

5. Abdoulaye Sall; 5 year old son of (1) and (2)

The hectares cultivated are divided in the following manner:

Peanut Cultivation

Compound Member	Hectares
Moustapha (1)	3
Awa (2)	½
2 laborers	3½

Awa works in the 3 hectares of millet with Moustapha. Moustapha has no horse or donkey, but has been able to borrow the horse of Meissa Sall, a patrilineal cousin. The only livestock he has is seven sheep and one calf which he had just bought from a group of Fulani herdsman transhuming through the village. He stated that his intention was to fatten the calf under the "embouche bovine" program of SODEVA and resale it at a profit. He was, however, concerned about where the money to feed the animal would come from. Moustapha has twenty-three chicken which are tended by his wife. He started buying the chickens after 1973, to raise as laying hens and for sale in Mbacke. His wife, Awa, sells the eggs and stated that the money she gets from the sales is used as pin money. Both she and Moustapha are very interested in poultry raising as a means of providing a little extra money.

As far as the modern agricultural program is concerned, Moustapha has bought a seeder and a plow, he does not have a souleveuse or a cart. For the first time in 1976, he bought 250 kilos of fertilizer and uses manure only on the peanut field closest to the compound, which is where the seven goats are kept. Moustapha admitted that he did not know how to spread the fertilizer and that he uses manure sporadically, both of which partially explain his low yields. In 1976 and 1977, his

peanut yield was 2½ tons. His millet yield in 1976 was 800 kilos and 500 in 1977. The compound consumes three kilos of millet per day and Moustapha informed the researcher that he had already purchased 300 kilos of millet in Mbacke (*this was January 1977*).

During the dry season, he is a petty livestock salesman and butcher, both at Mbacke and at Ngabou. Sometimes he even goes to Dakar where he purchases bowls, iron pots, spoons, and other small household items which he then brings back to Ngabou and sells to his neighbors. He and his wife also sell chickens and eggs at Mbacke and Ngabou. These income-producing activities take him through the dry season.

The Meissa Sall Compound: Land Alienation:

Meissa Sall is a 60 year old compound head at Ngabou and a patrilineal cousin to Moustapha Sall. Meissa's grandfather, Lattane Sall, was among those who cleared land with the grandfather of Malaw Diouf. The two grandfathers even shared a compound. Lattane Sall was a local spokesman for the Teigne of Baol and directed many tieddo battles. The land Meissa now has in his charge is completely in his hands, because his brothers are dead and he has only one sister's son, for whom he is responsible in terms of land inheritance. He now farms a total of ten hectares, evenly divided between peanuts and millet. Meissa feels that given the size of his family, ten hectares is all he can handle. Yet, he talked briefly about those hectares "gone forever" from his holdings through pledging for cash. He claims that over a period of many years he has pledged twenty-five hectares of land against cash which he never paid back. He also assigned land under the lamanat where one-tenth of the harvest was his return on allowing the land to be cultivated. Under the recent national domain law the person actually farming a piece of land is entitled to continue to do so and become the effective steward of the land.

Then ten hectares now cultivated are done by the following compound members:

Hut 1: 1. Meissa Sall, 60 year old compound head

Hut 2: 2. Mordou M'diaye; 15 year old son of the younger sister of (1)

Hut 2: 3. Demba Sall; 20 year old son of a younger brother of (1)

The hectares cultivated are divided in the following manner:

Peanut Cultivation	
Compound Member	Hectares
Meissa (1)	3
Mordou (2)	1
Demba (3)	1
3 laborers	5

The millet plots are divided in the same manner. These three people farm with a seeder and a hoe. There is no souleveuse and no cart. In 1976, Meissa purchased and spread 250 kilos of fertilizer and stated that because he has no cart he is unable to spread manure and has, in fact, been in the habit of giving it away to neighbors. Of course, since he has no sheep, goats, or chickens, it does not seem that manure is much of an issue for him.

In 1976, his peanut yield was 1 ton 500 kilos and in 1977, it was 1 ton 200 kilos. His millet yield in 1976 was 700 kilos and in 1977 it was 500 kilos. Like his other compound neighbors, Meissa is obligated to purchase millet between harvests. He, Mordou, and Demba take their meals with Mordou's mother, who is Meissa's sister because Meissa's wife died in 1975. Meissa contributes three kilos per day for his sister to prepare.

Neither of the young men in the compound has any income-producing activity during the dry season. Mordou attended the French-speaking primary school in the village and speaks some French, but has not been able to find work at Mbacke or Diourbel. Meissa stated that he did not see the point of the school being there, if young people could not find jobs when they left the school. Neither young man is married and Mordou would, under the traditional system, inherit from Meissa. Mordou may decide to remain in the village for this reason, but he stated to this researcher that he wanted to go to Dakar to live. If either, or both, of these young men leaves Meissa's compound, Meissa will be faced

with a serious problem of manpower for the agricultural tasks. This is a chronic problem at Ngabou.

Ngabou: Conclusions and Recommendations:

The most crucial problem in the village is low agricultural production, both the cash crop and the food crop. The data indicate that this is due to poor utilization of land, under-utilization of manpower, and shortage of manpower.

The problem of adequate farm tools and equipment is another bottleneck in the agricultural systems of peanut and millet production. About seventy-five percent of the compound heads own at least one seeder and the remaining twenty-five percent have access to one through borrowing. The importance of the seeder in planting has been stressed by extension workers. Farmers who sow by hand waste a great deal of seed. Not only is the seed wasted, but there is the problem of a lack of uniformity between the rows, which results in overcrowded rows and do not allow the plants enough "breathing space." At least fifty percent of the farmers in the village have plows, but the number of souleveuses was almost non-existent. This can, in all probability, be explained by the fact that it is a piece of equipment which is used uniquely for pulling the peanuts from the soil. This is a task of not more than a few weeks. The cost of a souleveuse does not seem to justify its limited function and use-time. Equally important is the fact that this piece of machinery requires a traction animal, if it is to work and only those compound heads who have a horse or a donkey own a souleveuse. Chemical fertilizer use was simply not a part of farming in the true sense of the word. This is understandable in light of the high cost of fertilizer and the risk of using it under conditions of unreliable rainfall (*the researcher was informed that the fertilizer "burns" the crop, if rainfall is insufficient*). The use and efficacy of manure had not been properly understood, but on the other hand, there were really not enough domestic animals in the village to produce sufficient manure; and if there had been, there were not enough carts or animals for transport.

The number of cases in which agricultural tools and products were viewed as readily marketable commodities to be sold or pawned as the need arose,

rather than as an investment in the agricultural economy, seemed alarming and certainly indicated a divergence from goal objectives on the part of small farmers and rural development planners and implementers. Each compound head stated that he was interested in whatever tools and products would aid him in his agricultural tasks. In this case, not one of them sowed by hand. They used a seeder, even if they had to borrow one. The two most fatiguing and lengthy tasks -- weeding and uprooting the peanuts from the soil -- were still performed manually.

As far as traction animals are concerned, the plots of the majority of the compound members were too small -- less than six hectares -- to justify an investment in traction animals. Many farmers expressed concern for the cost of feeding the animals and the problem of watering them.

Millet is the second most important crop cultivated at Ngabou and is destined for home consumption. It is only sold in small quantities *(usually right after the harvest)* to merchants in Mbacke in order to purchase small consumer products such as sugar, tea, coffee, milk, etc. As we have seen, the compound heads do not harvest enough millet to last from one season to the next, so that anytime between March and September, the majority of the families must buy millet from merchants in Mbacke.

The same millet bought between October and February, cost 20 CFA francs per kilo, but from March to September, the price can go up to as much as 50 CFA francs per kilo *(this was 1976-77)*. The attitude and perception of both men and women concerning millet production is a contributing factor in the low production yields of millet.

In several compounds profiled, the women were responsible for and assigned at least ¼ hectare of millet to cultivate, but in many other compounds the women worked in the millet fields of the compound head. Millet farming is not perceived as deserving the same amount of care and attention as peanut farming. The latter harvest has a monetary return of vital importance to operating the compounds and providing personal income for each person growing peanuts. For the women who have their own peanut plots to cultivate, as well as their regular domestic tasks to perform, millet farming is not a priority activity at the preparation, planting, and weeding stage. Women enter the millet production system principally at

the processing stage. They have the sole responsibility for millet once it leaves the fields and goes into the granary. From the stalk to the platter, women assume full responsibility for all functions. They do the pounding, the winnowing, and the food preparation. The seeming perception on the part of both men and women is that the male role operates at the beginning of the production process; and the female role begins at the end of the production process. What this means is that maximum labor is reduced at the crucial stage of soil preparation, planting, and weeding.

This problem of a reduction in the labor force at the crucial stage of soil preparation also holds true for peanut production. According to SODEVA officials the preparation stage should begin in January and go right through the first rains in July. The problem here is that the manpower in Ngabou is critically reduced during the months before the first rains, due to the search for income-producing activities, or the actual engagement in these activities in Mbacke, Diourbel, Kaolack, Dakar, and even the Gambia.

Several adult males leave the village during the dry season to pursue some type of income-earning activity. On the surface this may not seem necessary, since the compound head has income from the peanut harvest, which should see his family through to the next harvest. The question, then, is why is dry season income so important? First of all, while the income from the peanut harvest is in the thousands of CFA francs, it is spent very fast on essential items such as repair materials for the dwellings and courtyard enclosures, clothing, shoes, baptism ceremonies, marriage ceremonies, and installment payments on outstanding debts. This money received, beginning in December, is a yearly income, but does not last from one season to the next and there has to be cash to purchase millet for survival, as well as for other consumer necessities, until at least the next millet harvest. Obviously, the two agricultural activities basic to survival peanut farming and millet farming fall short of securing survival, therefore, a third; dry season non-farming income-earning activities are pursued away from the village. These are the three ways of survival -- clearly tenuous at best. Within each of these strategies of economic exploitation, there are the seeds of new strategies which could be incorporated into the on-going rural development strategy. Each of these

strategies, already in place, assumes an elasticity and character, peculiar to the particular village and its economic circumstances. As pointed out earlier, dry season non-farming income-earning activities forebode the worst for the maximum effectiveness of the operation of the two agricultural systems, in the sense that these dry season activities are conducted right up to the last minute possible before having to prepare the fields for the first rains. This means that the preparation phase is hurriedly and inefficiently carried out by the small farmer, who has also not had the benefit of the technical counseling and advice which is available from the rural extension worker *(whose task-oriented agricultural activities begin in January)*. The rural extension worker is hard pressed to find, on any consistent basis, the adult male farmers in the village for participation in one-to-one demonstration techniques or in mass education demonstration techniques and methods which are part of the preparation before planting. The selling or pawning of farm tools increase the disadvantage of the farmer. The inability to synchronize the agricultural tasks of SODEVA with those of the farmer is an obstacle which will be difficult to surmount, since the farmer views his dry season income-earning activities as crucial to his survival from one season to the next. He is trapped in a vicious circle in which his responses to the insufficiencies in the two agricultural systems reinforce themselves, because manpower and tool resources are increasingly committed away from farming for a major portion of the year.

The farmer is concerned with minimizing his losses in a high-risk environment, while the rural development strategy's concern is primarily with gaining increasing control over this environment through technology and education. From SODEVA's point of view one of the biggest problems is sedentarizing the farming population during the dry season and increasing their interest and commitment to farming tasks as a year-round activity, and not just as a rainy season activity. The effective operationalization of this would require the perception, on the part of the farmer, that remaining in the village on a fairly consistent year-round basis would be as income-generating as his movement outside the village during the dry season and a means of survival until the next season.

Income-Generating Activities Supportive of the Agricultural Systems:

Two activities which seemed to have the potential for generating income in farm households, as well as supporting the agricultural systems, were livestock fattening and poultry husbandry.

Livestock fattening began during the drought, when a number of farmers in the district started buying livestock and fattening them for resale. SODEVA encouraged this activity and initiated the channeling of this activity towards a more development oriented end, by incorporating it into the rural development strategy. Cattle fattening for profit was an innovation in the district which was a diffusion from the Serer Sine Saloum region and which spread to the district in 1969. By this time, Fulani herdsmen who transhumed in and through the district were desperately selling emaciated cattle, sheep, and goats. There were instances in which an emaciated bull sold for $30, a milk cow for $20, and a heifer for $10. Enterprising small farmers were buying these animals and fattening them up for sale, at a profit, to itinerant cattle buyers who, in turn, were selling them to slaughter houses or small butcher shops. How did the government view this activity in terms of its own goals? SODEVA recognized in this innovation the possibility for its inclusion in its draft oxen program, which was part of the national development strategy. The national development bank was requested to underwrite seed money for SODEVA's idea to incorporate this farmer-initiated innovation into the national strategy. Farmers, recommended to SODEVA's regional office by rural extension workers (*SODEVA's direct link to the farmer*), were approached and asked if they would be interested in purchasing cattle with money from SODEVA; and fattening these animals on food paid for by SODEVA. At the end of the three month fattening period, the farmer would sell the animal or animals to SODEVA at enough of a profit to repay the initial investment by SODEVA and clear a profit for himself. The economic situation for the farmer in the district had not improved, so, unfortunately for the draft oxen program of SODEVA, many small farmers would buy the cattle and resell them before they were fat enough to bring a profit, and then use the money gained from the sale. This meant that SODEVA got no return on its seed money investment. Finally, the national development bank ceased to underwrite the program and this innovation did not survive in that form.

In spite of the problems encountered by SODEVA in implementing its objectives of the national strategy, the strategy seems to represent an adaptive trend or innovation which small farmers have begun to shift towards as a hedge against hard times. The shift towards this particular adaptive strategy seems likely to continue in the same direction, as long as there is adequate variation in the environment; as long as rural attitudes toward drought perception remain constant; and as long as hydraulic resources remain underdeveloped in the country. Cattle fattening in the district was an innovation initiated by small farmers, and integrated into the national strategy as a variation which represented an improvement along the line of an established trend. But, was it really an established trend firmly integrated into the agricultural system? It seems not because the small farmer initiated this strategy as a source of quick money and as a hedge against hard times as he perceived that drought could be a very long and/or recurring hazard to his primary production systems. The crisis situation of the small farmer did not permit the luxury of delayed benefits within the context of a national long-range rural development strategy. The farmer could not wait two or three years to reap the benefits of the improvement of draft oxen over the horse and donkey as work animals in the fields. How, then, could this innovation have been optimally incorporated into the national stra strategy?

Technical Assistance and Women In the Development Process:

The development and implementation of a small livestock (*sheep, goats and poultry*) husbandry program managed by farm women, with the aid of appropriate technical assistance, would be a beginning attempt to strengthen the innovation begun during the drought. While men have full responsibility for the care and feeding of cattle, women assume responsibility for sheep, goats, and poultry. The proper care and feeding of these animals would have an impact on an intensified crop production program, if for no other reason than the production of organic fertilizer for the fields. The sale of eggs and even of chickens would bring quick money.

In 1976-77, the approximate total of domestic animals in the village of Ngabou was sixty-five sheep, twenty-five goats, twenty cattle, twenty-two horses,

nine donkeys, and eighty-five chickens. While this small holding of domestic animals cannot begin to provide adequate organic fertilizer for the hectares under cultivation, a consistent and diligent beginning could have some positive results, in terms of the attitude concerning the use of organic fertilizer manure. The problem of transport to the fields could be resolved by marshalling a joint effort in the utilization of existing carts in the village. This should pose no problem, since many of the Ngabou farmers are already engaged in a mutual cooperative effort, when they borrow, for example, a neighbor's horse and loan that neighbor their seeder. Some compounds that had only one or two sheep and goats before 1973, now have two or three and informed me that whenever possible, they intend to purchase more because these animals can provide an amount of added financial security if the need for cash becomes an immediately pressing problem.

The possibilities for poultry raising, as a variation on the cattle fattening or "embouche bovine" activity has a precedent in the village, which increases its chances for success and ability to sustain and replicate itself without large external inputs.

Beginning in 1964, there was a poultry house in the village and approximately three hundred eggs were sold per year. During that period, the chickens were fed millet, millet husks, and feed that was bought from a local merchant in Mbacke. This poultry house belonged to the women of the village and was initiated by the wife of the village chief, who involved the other women in this enterprise. Each woman was asked to contribute 150 CFA francs for the maintenance of this activity. According to the wife of the village chief, each woman who participated in this activity was proud of her contribution to a profitable undertaking. Each woman had the right to sell the eggs of chickens she contributed and to take some of the small chicks to her compound to start her own poultry raising activity. The women took turns cleaning the poultry house every day and feeding and watering the chickens. Access to a market for the eggs and chickens was no problem, since the village is only eight kilometers from the commercial center of Mbacke and is located on the main route, which provided an additional clientele in the form of travelers.

Unfortunately, the poultry activity came to a halt because the chickens began to die each year between December and January from an illness which the villagers were not able to isolate. This diminished the poultry stock to the point of abandonment of the activity by the women. The wife of the village chief and several other women in the village stated that the women would like to start this activity again because they felt that it was important to have something to fall back on when the crops fail, but they were concerned about the illness which attacks the chickens in December. Alioune Kane informed me that SODEVA was interested in supporting poultry raising activities by providing the technical assistance and advice needed concerning the proper care and feeding of poultry. This was already being done in one other village in the district.

The farmer-initiated the economic activity of investing in poorly nourished livestock, especially goats and chickens, for the purpose of fattening and eventually selling. This is an activity which could have tremendous positive impact on the rural development strategy, as long as external and expensive inputs which cannot be easily replicated by farmers are kept to a minimum.

Field Profile: Darou Karim:

Darou Karim is presently a Mouride farming village of approximately 393 people and located in a zone which came under peanut cultivation only after 1912. Land expansion, village creation, and Mouride consolidation began after 1912 by the emigration of talibes, under the orders of their marabouts to land "inhabited at that time by wild animals and Fulani herdsmen."[27]

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[27] This information was from Oumar Bousso who was an informant. He is an 82 year old marabout (the Bousso marabouts are Qadiriyya Muslim scholars) and large farmer at Touba Guede in the district of Ndame.
See also M. J. C. Fayet's article "Coutumes des Ouolofs Musulmans du Cercle du Baol" in Coutumiers Juridiques de l'Afrique Occidentale Francaise, (Paris: Librairie Larose), 1(8):176, Series A, 1937.

The boundaries of major Mouride expansion in 1912 fanned out to touch the larger towns of rural Senegal.[28] Mouride villages were strategically settled on land which had been traditionally inhabited by Fulani herdsmen, in a pattern of expanding concentric arcs with Touba as the center. The pattern of settlement was a set of spatial buffers, as settlement progressed outward, against attacks by Fulani herdsmen, whose herding way of life was under direct threat by this expansion.[29] As a Mouride village the residents regard themselves as talibes of the marabout under whom the village was created and settled and the marabout's authority dominates most of the village activities.

Darou Karim was one of these strategically settled villages. It was created in 1914, by the settlement of forty talibes, under the direction of two principle talibes; Dame Balla Lo and his nephew, MaYacine Balla Lo Dieng who were under the orders of their marabout, Massamba Mbacke.[30]

Ibra Dieng, the current president of the village peanut cooperative stated that when he came to Darou Karim, at 6 years of age, and from the village of Bode (*two kilometers from Darou Karim*), the village had less than 100 people. This was after the death of his father, Mayacine Balla Lo Dieng. At independence in

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[28] See Donal Cruise O'Brien, The Mourides of Senegal (1971:76) for a map of Mouride expansion and boundaries from 1912 to 1958.

[29] This pattern of settlement was explained and made clear to me by Oumar Bousso, Alione Kane, the delegue regionale of SODEVA at Diourbel, and Thierno Sow, my interpreter and principle informant.

[30] The history of the village settlement was told to me by Oumar Bousso; Ibra Dieng, currently president of the village peanut cooperative, son of MaYacine Balla Lo Dieng, and nephew of Dame Balla Lo; Moctar Lo, son of Dame Ballo Lo; Mamadou Dia, currently village chief at Darou Karim and son of Moussa Dia who was one of the original forty talibes; and Serignes Mohamadan Mbacke and Modou Faty Khady Mbacke, both sons of Massamba Mbacke.

1960, Darou Karim had a total official population of approximately 170 and in 1976, the total approximate population was 393.[31] In 1976, Darou Karim officially listed 77 compounds. My own census documented 61 compounds and a total population of 431. The total population figures at the district office reveal nothing for the elderly and small totals for people under fifteen years of age, as well as for women.

Village Location and Description:

The village is located in the district of Ndame which contains the religious seat of the Mouride brotherhood at Touba. It is six kilometers northwesterly of Touba with access by a winding and bumpy trail. Entrance to this trail is marked by a borewell with a water tower and overhead rubber spigots for filling water drums. The village has no public service. There are three small shops owned by residents which sell consumer goods such as coffee, tea, sugar, canned milk, kerosene, fabric, candy, etc.; two locally constructed mosques, a peanut cooperative; and one functioning well. There were two wells, but only one is now functioning. The first well was dug to thirty meters in 1956-57, by talibes of Modou Faty Khady Mbacke for the household he maintained at that time at Darou Karim. Its lack of depth precluded village-wide use,

[31] These figures were taken from the records kept at the district administrative office in Ndame. I was able to locate figures beginning in 1959/60. Interestingly enough, before the creation of the peanut cooperative in the evolving form it assumed after 1960, the population totals for males and females were almost one-to-one or fairly close to one another; for example, 37 males to 25 females or 57 males to 51 females. Since 1963 the totals for males is consistently at least double or more the total for females. My own census of the village revealed a pattern of almost one-to-one, thus totally incompatible with the official records at the district office. Discussions and observations suggest that official totals are inflated for the purpose of receiving additional kilos of peanut seeds. The official distribution is 100 kilos for each compound head and 50 kilos for each taxable male and female. The elderly and children below fifteen years of age are not taxed.

so young boys from age ten and up go to the bore-well in Touba, starting early in the morning, to transport water to the compounds in 200 liter oil drums during the dry season.[32] The second well was dug to forty or sixty meters (*depending on who the researcher interviewed*) in 1960, after a request to the department administration office in Mbacke finally received cement and iron for construction.

Adaptation and Change: The New Environment:

Darou Karim is a poor village with low agricultural productivity, despite the relatively large plots of land farmed by slightly more than one-third of the compound heads. Compared with Ngabou, its land and farm-tool resources are impressive; but it is plagued by a set of high risks, directly related to the physical constraints on production (*namely, the irregularity of rainfall and protracted dryness*). This is a set of risks common to practically all Mouride villages -- those imposed by nature, or rather the Mouride decision to gamble with nature by imposing an agricultural system in a zone which had been traditionally a seasonal pastoral zone (*Fayet, 1937:176*). O'Brien (*1971:193*) also points out that "the zone which the Mourides now occupy, or rather that in which they are concentrated, was not traditionally an agricultural area... The zone which now includes Touba, Darou Mousty, and Kael was, prior to French conquest in the late nineteenth century, exclusively a pastoral area, which migrant Fulani herdsmen used to feed their cattle in the rainy season. Settled agriculture was considered impossible, owing to the absence of water during the dry season..." Planting of the peanut crop cannot begin, until the rainy season arrives. If the first rains are late or extremely sparse, planting dates are moved back, thereby increasing the risks of crop damage or loss. For Mouride small farmers, this risk is a relatively fixed one with which they must cope. The income and food production system for the small farmer in the Mouride zone has always, partly by nature of its settlement, been a high risk endeavor.

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[32] During the rainy season the water supply is increased to include seasonal ponds called marigots. Drawing water is considered by the women to be extremely fatiguing, so they did not frequent the well as often during the rainy season as during the dry season.

Drought Effects in Darou Karim:

The tenuous state of the subsistence structure at Darou Karim experienced tremendous stress between 1966 and 1973, when recurring drought years caused extensive damage to the cash and food crops resulting in loss of income and dire food shortages. The combination of dependency on the peanut crop for income and the ever present scarcity and often absence of water casts the Mouride small farmer in the role of practicing brinkmanship farming. As important as the peanut crop is to the Mouride farmer, the millet crop is ultimately as important or more important, since it is the basis of nourishment and the primary source of food. There are more than one hundred hectares more of peanuts planted than millet; and while both agricultural systems are characterized by underproduction, the underproduction of millet is a direct cause of the annual crisis in food shortage. This food shortage was thrown into sharp relief during the drought. The approximate total number of hectares under millet cultivation was 481 in 1976 and 1977 (the same number of hectares is planted each season). Millet production yields have rarely, if ever, been more than one ton per harvest, except in the case of three compound heads and one who had a bumper millet crop of three tons in 1976. The remainder of the compound heads are obliged, each year to purchase millet beginning as early as March from shopkeepers and merchants in Touba and in the village. There were two compound heads who informed me that they only harvest two hundred kilos of millet, which is consumed before the end of the year. This means that they start to purchase millet toward the end of December. Just as at Mbacke, prices for millet rise from, for example, 20 CFA francs in October to as much as 50 or 55 CFA francs from March through the millet harvest in October.

The principle occupation is peanut and millet farming with approximately 615 hectares under peanut cultivation, approximately 481 under millet cultivation, and 8½ hectares divided between fallow and traditional vegetables such as sorrel (*bissap*), cowpeas, onions, and peppers. The soil is typical Baol soil; light and sandy with only a trace of nutrients.

Unlike some of the compounds at Ngabou, none of the Darou Karim compounds consume rice at the noon meal during the rainy season. One half of the total compounds cultivated more than five hectares of millet, yet, not

one among them harvests five tons of millet. The average millet yield seems to be higher than that of Ngabou, only because more land is involved -- it is between 500 and 1000 kilos per compound per harvest. As in Ngabou, it is very difficult to know, with any amount of accuracy, what the millet yield really is because, as the staple food crop, it goes directly from the field to the granary and is not weighed as are the peanuts.

Though some of the farmers begin to clear their fields in March, the majority begin to clear in April/May, in preparation for the first rainfall in early or mid-July. From early or mid-July until the last rains at the end of September or early October, the village is dependent on the rains for its drinking water and for the crops. There is one functioning well of at least forty meters and one artificial or seasonal pond, and the water table in both is dependent on the rains. During the rainy season, drinking water for the population and their animals comes from both the well and the pond. By the end of October, the pond is dry and the water table in the well has descended to a point which makes drawing water a very difficult task for the women. It is at this point that water is obtained outside the village.

Every household was designated one or two members, usually young males from ten years and up to transport water to the compounds. Seventy-five percent of the compounds own a cart, which is drawn by a donkey or horse and a two-hundred liter oil drum used to hold the water drawn from the bore-well spigot located four kilometers from the village. This task takes between 1½ and 2¾ hours round trip, and is done each day or every other day, depending on the size of the compound and the number of animals attached to the compound. The possibility of having pipes laid from the bore-well to the village was often discussed by men and women. The president of the peanut cooperative and the village chief informed this researcher that they had discussed this at various times with the village marabouts, who reside at Touba. During a discussion With Mohamadon Mbacke at Touba, this researcher was informed that the problem of water at Darou Karim is serious, but a decision concerning the alleviation of the problem would have to come from the Khalif-General. Clearly, the villagers of Darou Karim cannot appeal directly to the party representative concerning this

matter. Ideally, they can definitely meet with and articulate their problem of the lack of a year-round and secure source of water in the village, but the institutionalized structural mechanism or communications center is the marabout who communicates and interprets to and for the small farmer talibe concerning transactions with the larger community.

Village Wide Exodus As a Response To The Problem Of Water In The Village:

While the villagers of Darou Karim are far from apathetic about their lack of water to sustain the village after the rainy season, they do not express, as a solid political bloc, their community needs to their local political representative for the district. This representative makes direct contact with the marabout for the village, who resides in Touba, and expresses the needs of the community (*which may, in fact, not reflect pressing community needs*). Not one villager had an up-to-date national party card (*the cost was 200 CFA francs which many villagers felt was better utilized in purchasing tea, coffee, sugar, or canned milk*) until July 1976. At this time, the local politician was reportedly seen in the village by some villagers, during a local election campaign, for the purpose of solidifying his popular support. Some villagers reported being suddenly presented with membership cards, with the expected hope that they would support this politician. One compound head stated that the last time he had a national party card was in 1962.

Clearly, the response to the problem of water has not crystallized into a solution at the level of village politics. This has no meaning outside of expressed interest on the part of the marabout. The villagers have, nonetheless, responded in their own fashion to the lack of a secure and year-round source of water inside the village.

The problem of the lack of water in the village from November to July has created an interesting pattern of village-wide seasonal migration from the village to Touba during this period. Ninetyfive percent of the compound heads have some type of dwelling, or access to a dwelling at Touba during the dry season. This farmer-initiated strategy of adapting to the severe and pressing problem of water shortage, clashes head-on

with the rural development strategy in operation by SODEVA. This absence of farmers from the land they farm, except when they are actually farming, creates a problem for the dissemination of technical and educational information. The hydraulic situation at Darou Karim, just as at Ngabou and other villages in the Mouride zone, is by far the most crucial problem for the small farmer and for the rural development Ministry, who is charged with helping the farmer improve his general well-being and increase his productivity.

The Small Farmer and National Development Strategy: SODEVA As Implementer:

Darou Karim, as part of the district of Ndame comes under the rural development umbrella of SODEVA, which suggests that the farmer invest and commit himself to the modern technology package. For the farmer, who is already in a high risk relationship -- due to the physical constraints on production -- commiting himself to even portions of the modern technology package, exposes him to even greater risk, both in terms of increased cash outlays and increased dependence on external agencies and their services. The lack of a good mesh between the farmer's production activities and those recommended by SODEVA is understandable, if one assumes the farmer-oriented position. Yet, as SODEVA agents often pointed out, traditional technical exploitation has meant inefficient utilization of land and poor weeding practices. This results in poor production yields and inefficient utilization of manpower, which subsequently leads to the hiring of seasonal harvesters from the Casamance, who are paid a cash sum for their labor each harvest. Two bottlenecks at the socio-economic level of rural development are: (1) poor utilization of the land; and (2) poor utilization of manpower.

For generations, the small farmer at Darou Karim has been engaged in a cycle of income and food production activities, which are both the cause and effect of inefficient and ineffective farming practices; with attendant poor production yields, which then necessitate pursuing dry season income-producing activities in order to survive until the next harvest. These dry season activities run right up to between four and six weeks before the first rains, and simply mean that the important task of attentive field

preparation is hurriedly performed. The poor performance of this task would lower the yield even in the best rainfall year.

Since the family remains at Darou Karim during the dry season, Mbaye has enlisted the aid and cooperation of Ngaye Diaw, the brother of Ndeye Diaw (4), who lives at Bode to transport water from the bore-well at Touba to the compound. Moussa Ba goes to Touba two or three days a week to work as a bana-bana, selling jewelry and other small items. The income from this activity helps keep the family supplied with some millet. This economic and social unit is barely surviving, even in the best rainfall years.

Darou Karim: Conclusions and Recommendations:

The most significant change in this village since the drought is the seasonal migratory pattern of entire compound households from the village of Darou Karim to the town of Touba during the dry season. This is because of the severe scarcity of water in the village after the rainy season. Touba is extremely important as a center for the utilization of non-farming occupational skills, as well as involvement in some itinerant trading activity.

Though most compound households are cultivating land in accordance with the adult male labor available in the compound, the investment of land and labor is not positively reflected in the yields, which are more startlingly poor at Darou Karim than at Ngabou. This is true only because the amount of land cultivated by each compound in the former, is larger than that of the latter. Millet yields are especially low and this poses the problem of food shortages each year. A basic cause of poor production yields in both the peanut and millet agricultural systems is the poor utilization of land and labor.

This poor utilization of land and labor in the two agricultural systems means turning to dry season non-farming activities as a means of making ends meet, from one season to the next. These dry season economic activities are a crucial part of the total income package of the small farmer.

The passing of the dry season at Touba has prompted the investment in some type of dwelling

structure, which attests to the commitment of Darou Karim villagers to fully participate in a life-style outside of the village setting. This is in terms of need income-producing activities and changes in consumption habits. The attraction to the commercial center of Touba seems to be an irreversible trend which presents serious problems to SODEVA, in terms of the implementation of its recommended tasks for a year-round agricultural cycle which is designed to increase production yields in both the peanut and millet agricultural systems.

The Deckvotte Fulani:

The district of Dahra is located in the semi-arid southern sahel belt, which comprises the northern and central interior of Senegal (*Church 1968:58,77*). It is approximately 165 miles northeast of Dakar and approximately 47 miles east of the agricultural research site of Ndame. It contains the country's most important pastoral zones and forest areas. Trees average twenty to fifty feet in height and rarely occur in groves, as do the mangoe trees in the coastal and Thies region. They are deciduous, shedding in the dry season and have deeply penetrating roots and thorns. The most common trees are the baobab, tamarind, several varieties of gum trees, several kinds of jujube, and the African myrrh. Their leaves are small, which prevents excessive water loss. The baobab is a food source, as well as provides the fibre from which cords used in tying livestock are made. The tamarind is a source of food; and gum trees are tapped during the dry season as a source of income (*this is considered to be an occupation of Maures*). Jujube bark is a source of medicines. Small thorn trees shrubs abound and are also deciduous.[33]

The district has a total surface area of 7,226 square kilometers with 60 kilometers of paved road. In 1975, the total population, as taken from the district

[33]Needles from some thorn trees are cooked with meat from cattle who have died of a disease which causes the attacked portion of the flesh to turn black. The needles, supposedly, are a deterrent against sickness from eating this meat. There are several types of wild plants which are gathered on a daily basis by the women for the evening meal.

tax rolls, was 70,212; with a population density per square kilometer of 9.72. The vacation replacement for the district secretary pointed out to this researcher that the figures were very approximate, since the Fulani "have a history of not reporting births and deaths to the district office." Though the district is predominantly pastoral, there were 46,800 hectares under peanut cultivation; because of Wolof farmers who either live and farm there or who live outside the district, some as far away as Mbacke, and have usufruct rights in the district. Pastoral reserves, designated by the government within the district, provide grazing for herds during the rainy season.

The population break-down listed the Fulani as being fifty-two percent of the district population; the Wolof were forty percent; the Serer were five percent; and the Moors were three percent. Muslims were ninety-eight percent of the religious population and includes: the Tijaniyyas (*almost all Fulani*) at fifty percent; the Haidara at twenty-three percent; and the Mourides at twenty percent. Christians (*Catholic*) were two percent of the religious population.

As of July 1, 1976, there were officially two hundred villages in the district. There were three hundred fifty-eight, until the administrative reform of July 1, placed one hundred fifty-eight in the new district of Yang Yang.[34] Yang Yang was formerly a village belonging to the district of Dahra, but it is now a district in its own right due to its historical significance as the seat of the former kingdom of Djoloff. Of the three hundred fifty-eight villages, two hundred-thirty were Fulani; one hundred fourteen were Wolof; three were Serer; and eleven were Moor. Pulaar is the dominant language in the district, however, in the town of Dahra, Wolof is heard frequently; and government officials in the district tend to be Wolof or speak Wolof as the language of communication.

Deckvotte is approximately five miles east of the town of Dahra and south off the main road which leads to the departmental seat of Linguere. Access to the zone is by several narrow footpaths, which are not very visible during the rainy season when grasses have sprouted and thorn shrubs in bloom obstruct the paths. The zone has no public services. It has one well which, according to two village chiefs, was dug originally to twenty meters by zone residents and later dug to fifty meters by skilled laborers on the orders of the district headquarters

[34] Under the administrative reform effective July 1, 1976 Louga became the eight administrative region of Senegal and includes the districts of Dahra and Barkedji which comprise the department of Linguere.

officer in 1937. This well serves eight villages. There are two seasonal ponds called marigots which have water from the start of the rainy season to late October or mid-November, depending on the amount of annual rainfall. The district contains eight deep bore-wells which have a water tower (*water is pumped to the surface by a motor which is fueled by a type of gas-oil*), one of which is located at the veterinary post, located four miles northwest of the zone. This center is one of three in the district which has the responsibility for coordination of the livestock vaccination program and record-keeping of cattle vaccinated. In this regard, the only figures for total cattle vaccinated, the researcher was able to obtain, were for 1975 which showed 11,046 for the entire district. This figure indicates a very small ratio of humans to cattle in the district which had a total population of 70,212 in 1975. These figures were not broken down according to zone, so it was not possible to obtain any idea of the total cattle population of the zone. This figure was very approximate and represented an after-the-drought estimate. Interestingly, compound heads were, for the most part, not reluctant to provide estimates of livestock size before the drought and livestock lost during the drought, but provided figures (*which changed from conversation to conversation*) concerning the size of the herds in 1976.[35] Sizes quoted, depended on whether the researcher talked with the compound head alone; whether there were neighbors present when the researcher talked with him; or whether the researcher talked with his wife.

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[35] The Deckvotte herds were not very large even before the drought with average herd size being fifty cattle. Extremes were compound families who had ten cattle and three compound families who had ninety cattle. Raay (1974:24) had official documentation of average herd size at thirty-five for the Bororo Fulani of Nigeria but pointed out that he felt the tax records were not accurate so he "adjusted up to 50." Dupire (1962:338) found that the average herd size among the Bororo of Niger was "between 10 and 50 head in the region of Tahoua." After the drought the average herd size in Deckvotte was quoted to me as being between twenty-five and thirty in 1976, again with extremes of five for some households and sixty for the most affluent. These figures must be accepted with caution due to the size of the survey and can only serve as a small glimpse into the productive holdings of compounds in the zone.

Some informants stated in private conversations that it was "not a good thing to count exactly the size of the herd" while others produced their vaccination record which recorded the number of cattle vaccinated. Exact counting was not easy, since there were often cases of a cow, sheep, goat, or horse lost during the rainy season grazing in the zone; deaths at night due to hyenas and jackals who entered the compound's edge -- where small livestock were staked; death by disease, theft, and run-away horses or cattle lost in the forest area of the zone, due to what compound heads called "negligence on the part of the shepherd."[36]

In 1975, the total population of the zone was 818 people who were divided into 94 compounds and 8 villages.

	Total Population	Compounds
Baly Birame Nabo	93	9
Baly Demba Ngatame	204	25
Bocky Pourel	82	11
Deckvotte Lionabe	96	6
Deckvotte Loumbicore	164	20
Deckvotte Soucanabe	95	13
Deckvotte Thianor	59	7
Keele Dadie	25	3

[36] Theft of animals has been a nuisance to more affluent compound families. Five persons interviewed stated that a certain amount of "stealing" among relatives had always been tolerated. One informant pointed out that an increase in stealing has occurred since the drought. Two other informants spoke to me of their knowledge of a professionally organized theft ring operating out of Mbacke which spirits animals away during the night directly to Mbacke where they are sold on the hoof or slaughtered and sold. One wife who transhumes with her husband stated that "the problem of thieves is worst now than ever before because there is more poverty now since the drought than before. Ten or twenty years ago it was a neighbor or a relative who stole an animal, but now there are professional thieves. They are bandits who have no links whatsoever with the people from whom they steal - that is nerve."

Interview, September 1976.

Village boundaries were not at all sharply demarcated. Residents belonging to, for example, Baly Demba Ngatame live within fifty feet of some residents of Baly Birmae Nabo; the village chief of Deckvotte Thianor and a compound head of Baly Demba Ngatame have adjoining farm plots and their compounds are thirty feet apart, while a brother of the village chief of Deckvotte Thianor and member of Deckvotte Thianor lives approximately 2½ miles from Deckvotte Thianor. Compounds and compound clusters are dispersed in a sort of spoked wheel fashion with the spokes on the west side of the zone being very short, because it is the west side which is closest to Wolof farms and the grounds of the Centre de Recherches Zootechnique (CEZ), the national institute charged with the improvement of Senegal's domestic animals through crossbreeding and improved husbandry. This center has a sizable semi-fenced grazing area for its own livestock, which is not open to the public for grazing purposes. Animals caught on Wolof plots or on the CEZ grounds are confiscated and owners are confronted by the police and heavy fines.

Origins and Settlement:

The designation of "village" is more of a reflection of agnatic lineage groups or patrilineality, than territory in the zone. There are three patriclans in Deckvotte: the Ka, Ba, and Sow clans. The Ka are by far the largest of the clans and call themselves NDiengalbe, which they say is the name of the locale from where they all originated.[37] South of their zone are several other zones that are closer to the government designated grazing lands. Zone residents talk often of Gaile, Boulel, Gabougal, Thiarnge, and Neiri

[37] After asking Deckvotters several times what they called themselves and where their ancestors came from, they provided me with names which designated a locale and a clan. Reed (1932:423) documents a similar experience with the Borno Fulani of Nigeria "who have forgotten their tribal origin and call themselves simply Fulani, or if pressed, will say they are Hadeijah Fulani or Burmi Fulani and so on, giving the names of places with which they have been recently associated."

as rainy season transhumance zones. Each of these zones is inhabited by the NDiengalbe, who claim the district of Dahra and its environs as their place of origin. The residents of Deckvotte Soucanabe stated that they are also NDiengalbe, from a place near the district of Khougheul in Sine Saloum which is in the southeastern part of the country. It might very well be that the NDiengalbe of Khougheul conform to the migration pattern suggested by Pelissier and Journaux (1968:10), as a group of Fulani who came from the east. The Ba patriclan call themselves Habaobe and claim their origins to be between Senegal Oriental and Sine Saloum.[38] They are considered to be quite traditional, thus conspicuous in close proximity to other ethnic groups. The Bas are very few in the zone and were married to the Kas. The Sow patriclan, according to the village chief of Deckvotte Thianor, refer to themselves as Thianorabe. According to the village chief and another informant, Thianor is a zone east of Linguere which is inhabited only by Sows and the Thianorabe are the Fulani of Thianor.

The Agnatic Lineage Compound:

In the past, as now, the compound is the basic economic and food producing unit. Its livelihood depends almost totally upon the health, safety, maintenance, and reproductive capabilities of its herd. The food production system of these Fulani is a combination of livestock husbandry, millet farming (and now since the drought, peanut farming), and food gathering, supplemented

[38] Quinn (1971:431) discusses Fulani patrilineages in the Gambia and mentions one as being the "Bah" patrilineal group. The spelling Ba I have used conforms to that utilized by French speakers. In a later work (1972:19) Quinn discusses a Fulani "dialect" used in the Gambia, one of which is "Habobe" which seems to refer to the Habaobe of southeastern Senegal. Informants pointed out that the Habaobe speak "Habaobe Pulaar in Senegal Oriental and Sine Saloum but understand NDiengalbe Pulaar in the Dahra district and the Thianorabe speak Thianorabe Pulaar in the district of Barkedji." This seems to parallel Quinn's discussion of Fulani "dialects."

by a small amount of meat and foodstuffs purchased in local markets in Dahra. Various types of cooperative activity and behavior link families together across compound boundaries. For example, the formation of a search party for animals who have wandered away from the herd and are considered lost; the combining of small compound herds under the eye of one shepherd during the rainy season grazing; and the formation of work groups such as found among the Wolof (Ames 1959) to weed millet plots of compound heads who may be short of labor due to an extended long-distance transhumance cycle. Families are also linked across compound boundaries through marriage which includes the levirate. The linkage of families is based primarily on the principle of agnatic lineage groups. The compound, which is often co-extensive with the agnatic lineage, could be composed of: the compound head; his wives; unmarried children (who may be betrothed); married sons and their wives and children; widowed wives of brothers (widowed wives of older brothers are inherited through the levirate, but there is a prohibition against marriage between the older brother and widowed wives of his younger brothers -- these women simply join the compound); married and/or unmarried younger brothers and their wives and children; widowed and/or divorced uterines of the compound head; and occasionally the mother of a wife of the compound head. In the situation where the compound head is no longer active and has long since ceased to transhume and control decisions concerning the herd, the oldest son assumes economic and administrative responsibility for the family herd, unless the younger brother of the compound head is living in the compound. Responsibility for transhumance falls to the next eldest brother who will be aided by his own sons and the older sons of the compound head. Elder men in the zone assume less and less of a role concerning herd decisions, but are still consulted while elder women are all but completely ignored in the compounds. Raay (1974:24) notes that "the elders will spend their last days on the periphery of the homesteads of their sons." Death of the father does not necessarily mean that the eldest will head the compound. This depends on the age, health, both physical and mental, of the eldest and his management abilities. There are several compounds headed by men with older brothers of the same father and mother, living in the compound.

Compound Description:

Houses are of three basic types: (1) the twig, stick, and grass straw or reed beehive structures with a low opening, no windows, and dirt floors. These are generally constructed by the women; (2) the square millet stalk walls with conical thatched roof, an opening approximately 5½ feet from the dirt floor, a cloth or curtain serving as a door, no windows; and (3) the square cement walls with conical or slanting thatched roof, dirt or cement floors and corrugated tin doors and windows. This third type of house was new to the zone, having made its appearance since 1973 in compounds of the more affluent or prosperous residents. The latter two types were generally constructed by Wolof builders from town. Even if a resident had the money to build, a big problem in construction was the lack of water in the zone for making bricks and mixing cement. Unlike Wolof compounds, these compounds are generally not enclosed by a millet stalk fence. Instead they are open and millet and peanut plots tend to blend into the compound courtyard. To one side of the compound is the attachment stakes (*large tree branches*) for sheep and goats. The cultivable plots are usually on this side, and the cattle are corraled on the opposite side. The zone is southeast of Dahra and to the west are Wolof farm plots, the town of Dahra, and the CEZ grounds. For those living closest to the Wolof farm plots and the CEZ, their own farm plots tend to be to the west side of the compound, thus serving as a sort of buffer. Sheep and goats are tied to this west side at night and cattle are kept on the opposite or east side as a deterrent to damage of the fields and wandering toward the CEZ grounds. Sheep and goats are kept close to the compound as added protection against predators such as hyenas, jackals and thieves; while cattle are corraled some distance from the compound to put some distance between them and the fields. After the harvest the cattle are brought to the west side to graze crop fodder and in the process the soil is enriched. Not all compounds utilize the east-west pattern, but the point is that during the rainy season cattle are corraled on the opposite side of the fields and switched during the dry season to graze crop residues with soil enrichment being the by-product.

Each compound, with the exception of two, had a hut constructed specifically for the storage of surplus food and milk, tools, and utensils. There was one compound where the husband and wife had separate

huts for the storage of their personal household and work tools and utensils. The compound head and wife or the compound families shared the storage hut which usually contained the following items:

-tin tubs or basins for watering and feeding livestock
-cord and pulley for drawing water for livestock
-cords for attaching animals
-axe for cutting tree branches used in the construction of corrals
-coupe-coupe or sharp knife used for cutting tree branches
-saddles, harnesses, stirrups
-buckets made from inner tire tubing for drawing water for livestock
-calabashes for milking
-calabashes for pounded millet
-large black cast-iron pot for cooking
-mortar and pestle for pounding millet
-wooden spoons and stirrers for cooking
-teapot and coffee pot
-traditional hoe or iler, plows, seeders, rakes; for farming
-tin bowls, cups
-suitcases, trunks
-milk: fresh, curdled, sour
-pounded millet
-peanut seeds

In the hut shared by the husband and wife many wives had a long table constructed of small braided tree branches which contained between four and six wooden calabashes and tin bowls of fresh and curdled milk. Some wives had small suitcases containing dried peppers, salt, and other condiments used in cooking. Husbands usually controlled the sugar, since they either made the tea or designated someone else to do so.

Rainy Season and Dry Season Activities:

The families of an agnatic lineage group are not in common residence all year round, because long distance transhumance begins in late December and early January. The transhumance leader will either have made

a preliminary scouting expedition (*which can take from one to three days, depending on whether he walks or takes a taxi*), inquired from those who have done so, or will simply rely on his years of accumulated knowledge concerning the traditional transhumance pattern. Deckvotters maintain a common long-standing dry-season transhumance pattern which is along the southern and southwestern commercial routes. They tend to camp near large agricultural villages and towns which provide market outlets for the wives and daughters selling milk and, in a few cases, for husbands who have ventured into the trading of livestock during dry season transhumance as a sideline which brings in additional income or spending change. My observations of Deckvotters in terms of their transhumance decisions parallel Stenning's observations of the Wodaabe Fulani of Nigeria. He stated the follow:

> "We cannot express too strongly our disagreement with the view that Fulani pastoral movement is aimless, random, and swift....It is based on an intimate knowledge of a tract of country, its human, bovine, and animal populations, its resources in pasture, and its marketing possibilities (1959:207)."

Dry season transhumance reaches as far south as the larger towns in Sine Saloum, which is the largest peanut producing zone in Senegal; Colobane, Kaffrine, and Kaolack. Traveling westerly, the herders set up camps outside Mbacke, Ndoulo, and Diourbel, which are all large towns providing the transhuming wives with access to large markets and many clients for their milk. These women are able to travel back and forth between these towns by bush taxi or by train with their milk. Some herders go as far west as the Thies region and on down to MBor. Thies, Diourbel, and Sine Saloum comprise the peanut basin of Senegal and in these regions one finds the largest concentrations of farmers. Herders, therefore, are obliged to close out their long distance transhumance cycle no later than the eve of the first rains due to extensive farming activity and occupancy of the land by farmers and their families, increased demands by them on the water resources, and most importantly, the possibility of herd damage to prepared fields.

The farmer views the arrival of the herdsman during the dry season quite positively. Cattle are

allowed to graze crop residues which provides the farmer the chance for soil enrichment without the problem of transport of manure to the fields. There is also the ready supply of milk and butter. In return for the by-product of soil enrichment and milk and butter, the farmer allows the herdsman unlimited access to the well or wells in the area. Quite frequently I listened to complaints from Wolof farm women that they would walk the distance to the well only to find that the water table had significantly lowered due to frequency of use by herdsmen.

The herder begins his trek northward, not so much to follow the rains, but to remove the herd from a changed environment. Nothing hauls a herder into district police headquarters quicker than a complaint filed by a small farmer against the herder for damages to the farmer's fields or crops caused by unattended animals. Thus, the herdsmen start to vacate the agricultural belt in late June, moving north and leaving behind them their most profitable markets. They arrive in the residential zone in mid-July or early August. Rainy season transhumance is within the district - south of the zone in Lainde, Gabougal, Thiargne, and Niere, for example. The most abundant milk-producing period for the milk cows is during the rainy season when the herds are far from the ready markets in the agricultural zones.

Milk Surplus and Waste:

Milk is the beverage which symbolizes welcome, hospitality, camaraderie, trust, and all that is traditionally Fulani. It is offered to strangers and kin alike as a way of saying welcome. It is offered to quench the thirst and to quiet the hunger. It permeates every facet of Fulani social life and is an endless topic of conversation among men and women. It is redistributed at all life crises ceremonies - baptisms, circumcisions, marriages, and funerals; thus, its importance goes beyond subsistence. It renews and strengthens social bonds, linking different groups in a network of reciprocal rights and obligations. It represents a lot of what is intangible and not to be displayed in a commercial fashion. It means domesticity and is the property of a man's wives. It seemed that it was the very personal and intimate view of the role of milk in the Fulani social system that the older household heads expressed dismay that their women now actively sell milk as opposed to exchanging it and

and that furthermore, they are obliged to enter the big towns to do so.

The abundance of milk is a reflection of the wealth in cattle and redistribution is a socio-economic way of disposing of surplus. Exchange was another traditional way of handling surplus. Since the drought, surplus milk assumed a more cash oriented commercial role and was sold for 100 CFA francs per liter in market towns and villages near transhumance camps during the dry season transhumance. During the rainy season women leave the zone early in the morning with calabashes full of milk which they will sell in Dahra. Some take bush taxis and travel as far as Mbacke or Diourbel. The problem confronting women who remain in Dahra to sell milk during the rainy season is a saturated market and low demand.

The product, under natural conditions, cannot store for long periods of time. The response to this disequilibrium in supply and demand was the non-profitable disposal of whatever amount was not guarded in the compound, redistributed, or sold by pouring it in the seasonal ponds, feeding it to the dogs and horses, and drying it into cakes for animal feed. Rada and Neville Dyson-Hudson (*1970:122*) have documented the feeding of surplus milk to dogs among the Karimojong in Uganda. The abundant production period coincides with the forced removal from market outlets for yields. For Deckvotters this represents a loss, however the problem is not as severe now because diminished herds diminish the amount of milk available as surplus. The problem of a distribution system remains to be a development issue.

Livestock Husbandry:

During the rainy season livestock food consists of the grass and leaves in the residential zone and those further south in the grazing zone. The dry season grazing diet of grass and leaves is supplemented, by those who can afford to do so, by hay and peanut crop fodder from March or April when grass is nearly exhausted until the rainy season. Hay and peanut crop fodder are sold by the cart full or the 100 pound sack for from $1.50 to $10.00.

During the rainy season livestock are watered everyday, but during the dry season cattle are watered

every two days which gives them the appearance of being bloated soon after being watered. Sheep and goats are watered every day. During the beginning of the dry season before transhumance begins (transhumance begins after the close of the agricultural commercial season in the peanut basin) the herds are driven three miles to the bore well watering troughs at the veterinary post. Water is drawn from the zone's well in special rubber containers for weaker animals by the men and boys charged with the herd.

Rainy season herding in the zone is the responsibility of the sons of herd managers. If a man has no sons he confides his animals to a lineage member's herd. Sometimes the younger brother of the compound head who has responsibility of the family herd will do the herding, often spending the night in the woods while the herd grazes. Young girls no longer herd and I was informed that it is not because they refuse to do so, it is just that the adults themselves consider it "out of fashion for young girls to herd." Several compound heads expressed concern over the fact that getting the young men to herd responsibly is becoming a problem and that if a man has no sons he is often obliged to hire a shepherd.

Food Production and Food Consumption:

The Deckvotte Fulani livelihood is dependent, to a large extent, on their milk. Production yields of the livestock are very important since it is the milk, butter, and offspring - not the meat itself - which sustain the basic economic unit. The maximum daily yield for healthy and well fed milk cows during the rainy season was 6 pints and 3 pints or less during the dry season.[39] Several wives who transhume with their husbands reported selling 180 pints of milk from one cow for one month. Some residents expressed

[39]Rada and Neville Dyson-Hudson (1970:113) found that the yield of a milk cow in their 1954-58 study among the Karimojong in Uganda was 4.78 pints at its highest during the rainy season and 2.13 pints at its lowest during the dry season.

concern over the lack of salt in the grazing grasses of the zone which affects the amount of milk given. The livestock services have introduced through the veterinary post in Dahra the licking stones which contain phosphorous and calcium and are used by some residents of Deckvotte. Whether the cows lick the stones or not, many wives informed me that the yield is almost nothing by March. The butter which has a very rancid odor and sharp taste was kept in liquid form and often exchanged for millet.

There were varying arguments on the reproductive capacity of cows - some household heads stating that the drought diminished herds would take fifteeen years to rebuild based on a reproductive pattern of a calf every three years and others based their projected rebuild target on a calf every two years. Average offspring yields in the zone tended to be every three years. A veterinary agent of SODEVA at Mbacke informed me that a major problem with cattle reproduction in the Djoloff was malnutrition and low phosphorous and calcium intake of the herds.

Agriculture and the Fulani of Deckvotte:

Millet farming has been part of the food production system for at least three generations and is the primary responsibility of the men, more specifically, the compound head. Zone farming experience goes from one end of a continuum to the opposite end - from one compound head of 72 years who stated that he had never farmed in his life to another compound head and village chief of 74 years who stated that he has been farming for well over twenty years. Millet plots were very small and poorly cultivated. Plots ranged in size from ¼ hectare to 1 hectare. Average size was ½ hectare. Farm implements consisted of the traditional hoe or iler, plows, and infrequently, a seeder. The horse and donkey were used in tilling. There were no hard and fast rules about planting, on the whole, millet was planted on the eve of the first rains. However, the first planting often did not germinate or did but was destroyed by insects and rats; thus, I observed herders planted millet as late as August. Once the crop had begun to grow, there was the problem of weeding, which was an erratically pursued task. The harvest of 1 hectare was never more than 400 kilos, if that much. Normally 1 hectare should yield 1 ton 300 kilos, but even this amount is not sufficient for a compound family of

five adults and six children who consume four kilos of millet per day. This crop is harvested by men and women and carried to the compound in the tin tubs or basins where it is placed in the granary and ground by the women as they need it. The family begins to eat from this harvest in late October. By April or May the granary is empty or near empty.

Millet farming has not been a serious enterprise in the zone, yet only one out of the forty-eight household heads interviewed had never farmed in his life. This was the 72 year old informant who informed me that while he watched his neighbors and even his sons turn to peanut farming toward the end of the drought he could never farm because it "just wasn't the way my grandfather and his father lived." He did admit that age and failing eyesight would not permit him to farm even if he wanted to. By August 1976, new behavioral and production patterns were merging as a result of the drought: Wolof language acquisition by some of the women who transhumed with their husbands and sold milk in the towns near the transhuming camps, changes in dress, and the beginnings of peanut production were the most prominent changes.

Drought and Adaptation:

The most conspicuous new subsistence behavior was the entry into the cash crop economy of peanut farming. With the exception of one compound head who confided his share of his father's inheritance to his younger brother upon the father's death many years ago so that he could pursue his interests in livestock trading and farming, cash crop farming came to the zone between 1966 and 1973, which was the period of the drought.[40]

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[40] There seems to be a hierarchy in the sale of livestock. For large expenditures bulls of two or three years are sold (particularly the thin ones), then old and no longer fertile cows. Producing cows are the core of the herd since they, as one informant pointed out to me, "produce the bulls and the calves and the heifers from which springs our richnesses." Dupire (1962:336) notes that the cattle among the Wodaabe of Niger, are considered "the means of production..." For small expenditures sheep and goats are sold and this has been documented by Dupire whose interpretation is that sheep and goats "form a small granary readily turned into money, which allows one at any time to procure consumption goods or other items of relatively high cost" and by Raay (1974:6) for the Bororo Fulani of Nigeria where "one could argue that sheep and goats are 'small denominations of the Fulani currency."

Herd managers who transhume were unable to, and more importantly, uninterested in participating in growing peanuts, or millet for that matter; but did assign an older son the responsibility of clearing a plot and planting the seeds. The compound head is responsible for obtaining the seeds from ONCAD which is 100 kilos for the compound head and 50 kilos for each taxable male and female. The same farm tools used for millet cultivation are used for peanut cultivation and just as with millet, the norm was no more than 1 hectare of peanuts. Yields were also poor, ranging in 1975 from 312 kilos to 1 ton for 1 hectare planted and from 800 kilos to 2½ tons for 2 hectares planted. Some of the men now growing peanuts had never used farm tools before. Millet farming has been viewed as an activity engaged in to supplement the diet rather than as an economic occupation which is how peanut farming is viewed. The theme repeated throughout the zone concerning peanut farming was that it was resorted to out of sheer poverty. The disdain for farming was repeated often.

The Fulani and Sodeva:

Entry into the cash crop economy would seem, on the surface, to draw the Fulani within the orbit of the agricultural modernization strategy since they would have to interact, however superficially, with ONCAD and SODEVA. In 1976, it was clearly observable that Deckvotters were not knowledgeable about peanut farming. A good index of this was the low millet and peanut yields. It is true that a genuine lack of interest in farming may partially account for low productivity, but haphazard and late planting, as well as negligent weeding practices and insects and rats (exterminating services and measures are provided in the agricultural zones) took a toll on crop yields. During the rainy season of 1976, no rural extension worker representing agricultural agencies paid a visit to the zone. Residents often asked my interpreter/informant who was at the time detached from his duties at SODEVA to work on this project about such things as the optimum time to plant millet and peanuts and the amount of distance which should be allowed between rows planted. Some SODEVA officials stated that an investment in time and personnel in the zone for agricultural development would present a problem because the transhumance cycle did not mesh with the agricultural cycle recommended by SODEVA for farmers. Though four of the more affluent members of the zone have joined the peanut cooperative

and two of them have bought seeders on credit, one of them had pawned his seeder because he needed immediate cash. In many compounds a large portion of the peanut seeds received at the beginning of the agricultural season for planting were cooked for inclusion in meals. While these Fulani had not been officially drawn into the agricultural development strategy in the sense of being on the official list of a rural extension worker or participating in the peanut cooperative, they have been able to gain some fleeting benefits from the strategy by obtaining access to peanuts for seeds and some credit for light machinery which was treated as commodity items rather than as farm implements.

Though SODEVA may have been slow to embrace these "new farmers," it very wisely utilized the knowledge and skills of recommended zone residents in the initial stages of its draft oxen program for the agricultural zones. Farmers in the agricultural zones generally had no experience with these particular animals. Breaking the animals in - yoking them - training them to respond to the simple work commands and allowing them to get adjusted to walking yoked together often frustrated Wolof farmers who would strike a protesting beast who refused to stand up. Fulani herdsmen never found it necessary to strike these animals (they considered this to be cruel and unusual punishment) and worked skillfully with SODEVA in training them to the yoke. As Raay (*1974:19*) pointed out, "Fulani pastoralists form the only substantial group that has the opportunity and skills to mobilize cattle for draught purposes without excessive difficulty."

Drought and Livestock:

Herd managers stated that during the first year of the drought they waited in the zone until August, when they received word that there was rain in the Sine Saloum, but that when they arrived they found that the grazing land was completely exhausted. From 1966 to 1973, herd managers throughout the zone sought grazing land and watering holes for their herds that no longer yielded either for their herds. Compound families lost at fifty percent of their cattle and small livestock during the drought. The average carrying capacity of herds was fifty cattle which had diminished to between twenty-five and thirty by 1976. One village chief stated that "cattle are synonymous with life - they are the essence of a Fulani man, and without them, a man is a

pauper. When a man loses his cattle, he has lost everything."

There is no government social security system so that when a man loses "everything" his support network lies outside the government. Government policy regarding herdsmen has been more or less a "laisses-faire" policy of allowing them to raise livestock in their own way; the only regulatory requirements being livestock taxes and obligatory vaccinations for cattle. Policy expansion has also included the CEZ which is responsible for the improvement of Senegal's domestic stock through cross-breeding with animals from, for example, France and Pakistan as well as improved animal husbandry techniques. The services of this center are available on a voluntary basis. The herdsman's participation in the national economy before the drought was limited primarily to the following: (1) the paying of head taxes through the district headquarters which brought only the village chief in contact with the government's representative in the district headquarters in Dahra. These officials tend to not be Fulani, therefore, there are no kin links between the zone and the government at this level of interaction;[41] (2) the paying of livestock taxes through the veterinary center which brought compound heads in direct contact with officials of the government. Again, the personnel was not Fulani and not local, having been trained in the larger towns and assigned to this post; (3) the vaccination of livestock through the veterinary center which brought compound heads in direct contact with representatives of the government. This center also provided some counseling, advice, and aid in the event a problem arose concerning the health of an animal. At this level of interaction a herdsman may be able to establish some bond between himself and the center based on what can be viewed as "use frequency" since officials at the post became familiar with those herdsmen who frequented the center. In a sense, attitudes toward the

[41] District headquarters personnel, except for the secretary, were not Fulani and had been trained in Dakar. The vacation replacement for the secretary was a Wolof who never failed to remind me of how "uncivilized" the Fulani were. Those Fulani who had to see him for some reason were responded to either rudely or condescendingly.

government is reflected in herdsmen's assessment of the personality[42] and services rendered by officials at Dahra. For example, A Deckvotter who walks from the zone to the post to inform the veterinary agent that he has a sick animal in his compound and would like the agent to come out to the zone to examine the animal is none too complimentary about the government if the agent does not come or comes and does not save the animal; and (4) herdsmen were able to borrow a bull or horse from the CEZ for mating purposes.[43] They were responsible for feeding the animal during the period they kept it. Several herdsmen complained that feeding these animals was just too expensive and also that a new bull among the herd created more problems than they had the time to attend. Generally, it was the more affluent herdsmen who availed themselves of this service; thus, the center's director had contact only with certain herdsmen at Deckvotte. This may have certain implications for future district projects which seek recommendations of "progressive" herdsmen. I, for example, was given a list by the director of the center of herdsmen in the zone whom he felt would be most responsive to my research tasks. They were all herdsmen who had visited the center for the purpose of borrowing an animal for breeding purposes. There were six names, three of whom were "el Hadjjs" or men who had made the pilgrimage to Mecca. They were all large herders in relation to the other herders in the zone with a carrying capacity of at least sixty cattle before the drought. As it turned out I was introduced to two other "el Hadjjs" in the zone who had never visited the center and were complimentary of

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[42] The CEZ director is considered to be a good man because he has been known to reduce fines against Deckvotters whose animals have wandered onto the CEZ grounds and because he has medically cared for several sick Deckvott animals. Her personally enjoys a good reputation in the zone but the center is damned for its policy of fines and confiscation of animals caught on the CEZ grounds.

[43] Before 1973 a herdsman simply borrowed a bull or horse for the rainy season. Since then he has been required to leave a service fee of 1,000 CFA francs and some type of collateral. One informant stated that his brother's son was able to borrow a bull for the rainy season after leaving 18,000 CFA francs as collateral which was returned to him when he returned the bull.

the center's work, but stated that the director tended to recommend his "friends" to visitors to the zone. The center is viewed as a thorn in the side of Deckvotters because it restricts movement of herds and was the cause of village wide displacement when it was first constructed, yet the director, who is a veterinarian, is respected. He is also Toucouleur which removed at the very least the communications barrier since he also speaks Pulaar.

One resident from the zone is employed by the center as a caretaker of the center's stock -- he feeds and waters the animals and cleans the stalls. He is a younger brother of a village chief. Interestingly enough, he considers the techniques of animal husbandry employed by the center to be something distinct and almost alien to husbandry techniques employed by Deckvotters. Though he discusses what he observes at the center with his neighbors, and his older brother, as village chief would be able to influence village residents to adopt a particular husbandry technique; the prevailing attitude is that what the center does is bevond their technical and financial reach and also part of the outside world.

Articulation and Development:

There was some understanding of the government as being projected as a managerial entity and dispenser of benefits of a participant citizenry. For example, livestock taxes were paid until their suspension in 1973 by the government due to the heavy losses in livestock suffered by the pastoral populations. Herdsmen paid their taxes and felt that however impersonally, they were participating in the national economy which called for a modicum of protection of their interests - territory and cattle. There were frequent discussions by Deckvotters about whether and when the tax would be reinstated. Over half of the household heads felt that the tax should not be reinstated since they could use the money for household and personal necessities. Yet, there were many other household heads who expressed a greal deal of concern over what they saw as a relationship between the suspension of the tax and an increase in the encroachment of Wolof farmers in the zone, a lack of response of the district office to reports of animals lost in the woods or stolen, and an increase in the imposition of fines against Deckvotters by the CEZ.

Stock improvement, herd safety and health, and improvement in the living standard of pastoralists are part of national development strategy. They are the same goals desired by Deckvotters, yet the two sets of goals have few points of articulation to the mutual satisfaction of the two sets of participants. This is documented, most importantly, by the low priority given the livestock sector in the national budget which reflects an lamost non-existent live-stock-raising infrastructure, such as sufficient wells, veterinary posts, roads, dairy markets. The other side of the coin is that of the herdsman's traditional attitude and values concerning his cattle, namely, that they are not for mass commercialization, but are, rather, for prestige, investment, and insurance against the future. Every household head stated that his primary goal and desire was to become a diarga. This contemplative attitude toward cattle is not considered by development officials to be compatible with national interests since an increase in herds would ultimately tax the carrying capacity of the pastoral zones and at the same time still not place enough meat on the markets to meet country demands.[44]

According to a study conducted by the World Bank (*1974:69*) the livestock sector received only one percent of the central government budget between 1965-66 and 1970-71. This insufficient commitment hindered extension services in their tasks of improving techniques of livestock husbandry and, according to the World Bank finding, "insufficient extension service field personnel and equipment have been major factors in the lack of progress in using improved methods and, therefore, in raising the low off-take and growth rates of cattle, goats, and sheep."[45]

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[44] I have selected the fourth definition of Webster's Third New International Dictionary (1966:491) to describe the Deckvotte Fulani attitude toward their livestock. Contemplative is "the act of viewing steadfastly and attentively: the viewing of something (as a picture or a scene) for its own sake:"

[45] The civil servant in charge of the veterinary post at Dahra informed me that one of the reasons he did not make trips to Deckvotte to attend sick animals was because he did not have a vehicle at his disposal.

Under the Second and Third national development plans emphasis was placed on improving veterinary control and the Fourth four-year plan for economic and social development which was adopted by the National Assembly in 1973 promised to improve the hydraulic resources of remote villages and implement development strategies in the livestock sector. The herdsman in Deckvotte, however, who will ultimately be affected by development strategies, ideally and structurally makes his input and feedback concerning strategy implementations through his district national party representative. The reality is that Deckvotters do not actively participate in party politics and the national party representative in Deckvotte engages mostly in the selling of party cards which he has little success with. The very low political profile of Deckvotters is mutually recognized by the Deckvotters and the national party, thus, in the absence of government interventionist strategies flexible enough to address immediate local needs as opposed to long range projects designed in the national interest, the Deckvotter has utilized innovative means of exploiting trans-ethnic occupations in an attempt to assure the survival of the herd which is synonymous with his own survival. Traditionally, there seems to have been an ethnic partition of occupations in Semegal, for example, the Lebou are fishermen, Wolof are farmers, Fulani are herdsmen, Maures are traders and small merchants, etc. These ethnic affiliations and occupations defined economic spheres of exploitation.

Innovative Strategies To Drought:

The drought of 1966 to 1973, brought into sharp focus the results of neglect and low priority in the livestock sector by the national economic and social development plans. Even before the drought livestock productivity was low. The primary problems were underdevelopment of hydraulic resources and the relative scarcity of grazing land which tend to be among the classic characteristics of the pastoralist's environment. During the drought this problem of water and grazing land scarcity intensified and was responded to by Deckvotters with new and modified behavior. First of all, flight or migration out of the zone on a permanent basis was not seriously considered by any household heads interviewed. There was some movement from the zone to the town of Dahra which affected

neither official records nor the network of responsibilities and duties among agnates. Four villages have members now actually living outside the zone, two of whom are the village chiefs of two of these villages; but in each case these households maintain their allegiance to the zone in terms of patrilineal networks and cattle grazing patterns. Each household continues to be listed officially as belonging to Deckvotte by paying head taxes through their respective villages. The migration of the group from Baly Birame Nabo was due to the problems of animal confiscation and fines from the CEZ. This group no longer pays taxes in the zone. Nine households from Baly Demba Ngatame migrated south to Gaile, Gabougal, and Neire because they decided that the grazing lands were more extnesive and abundant than those of Deckvotte and had no Wolof farmers "shrinking" the grazing lands. One village chief and his household moved permanently to Dahra because of old age and the second village chief now living away from Deckvotte in Dahra is in town because of a serious illness which prevents him from performing much physical labor. In each case their younger brother remains at Deckvotte and has responsibility for the family herd. These were the only instances of any movement out of the zone during the drought. What was more prevalent was that dry swason long distance transhumance slipped imperceptibly into nomadism since the absence of food and water for herds precluded the possibility of returning to the zone during the rainy season. Entire compounds closed with the old, infirm, and children being placed on donkeys and in bush taxis to join the herds. The traditional transhumance route was traveled, the only difference being that its boundaries were somewhat lengthened southward. In the more affluent compounds those members who usually remained during dry season transhumance informed me that they remained at Deckvotte during this period, joining the herds from time to time, and were able to remain at Deckvotte because animals were sold for food. During dry season transhumance a member of the compound is dispatched from the residence to join the herd in order to bring back money from earnings during transhumance.

Having decided that flight was not the best response to survival during the drought, innovations which meant crossing ethnic occupational boundaries, such as cash crop farming, petty trade, small and continuous trade, and local commerce, were the principle hedges against the sale of animals from drought diminished

herds.

Trade in livestock, poultry, gum, amulets and traditional medicines, and dead wood are not new economic activities; but traditionally had not been engaged in by the Deckvotters. They considered the exploitation of gum trees and the sale of the gum to be an economic occupation of Maures.[46] Informants pointed out that they have long observed Maures and Wolof tapping the trees in the woods of the zone, but would never have considered this a job for Deckvotters. Two extreme reactions to the beginning entry of some Deckvotters into this activity are recorded below. The first was that of a village chief and two compound heads who related the following account to me of their gum activities in 1973, 1974, and 1975:

> "Between February and May we would leave home early in the morning and return in the evenings with the gum in the rubber bags used for drawing water for the animals. When we had filled the bags we left for Dahra and left the bags at the home of a friend and waited until it was dark before we wold the gum to a Lebanese merchant. We waited until dark because we did not want our relatives and close friends to know that we were selling gum which is an occupation of the Moors. We did not want our relatives and close friends to say "those men had cattle and now they work like the Moors."
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> Interview, August 1976.

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[46] Curtin (1975:82) discusses the gum trade in the nineteenth century in Senegambia. Moors were very prominent in this trade, and according to Curtin, "north of the Sengal, many Zwaya Moors were active in the gum trade and in the more general exchange between desert and savanna. The usual points of exchange for gum was the north bank of the river, but Zwaya caravans came as far south as Cape Verde and occasionally to the Gambia as well, so often that all Kayor and Waalo fell within a Moorish trading zone. See also Charles Stewart, Islam and Social Order in Mauritania (Oxford: Clarendon Press), 1973 for a dicussion of Moors and gum.

The second was also that of a village chief who, unlike his neighbors quoted above, attached no shame to extracting gum and selling it:

> "I have been selling gum for a long-time - long before the drought years. I sell by the 100 kilos which brings me 17,500 CFA francs. In 1976 I sold almost one ton - 900 kilos. I begin in January ans work until April. I sell to Abdou Yassin, a Lebanese in Dahra. I am not ashamed to sell gum."
>
> Interview, September 1976.

Snickering and laughter often accompanied any discussion of petty trade and small trade engaged in by Deckvotters. The generic term for trader used by Deckvotters is dioula which is an independent, itinerant trader who sells anything, but usually the term was used by Deckvotters in reference to livestock traders.[47] Trade in livestock seemed to rate the highest among small trade occupations unless the person was that Deckvotters called a telfonken.[48] One village chief and

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[47] Dupire (1962:347) obviously encountered the diola among the Bororo Fulani of Niger and describes them as "independent traders." Curtin (1975:69) discusses a commercial and religious community of merchants operating during the precolonial period who formed a trade diaspora. Some were Soninke from ancient Ghana and "an important branch which operated before 1500 dropped south from the Niger to Jene through Bobo Dioulasso.... In the process of developing this route, the merchants dropped the Soninke language and picked up a dialect of Malinke, modifying their culture in the process. In time, they adopted a self-identity as Juula; juula being the Malinke word for merchant...." NOTE: In French-speaking countries d before vowels has the English sound of j before vowels. Note that Dupire, a French speaker writes dioula and Curtin, an English speaker writes juula.

[48] A telfonken is a variation of a dioula, the difference being that the telfonken starts off with no capital of his own. At the market place he solicits from his assembled colleagues any amount he can from 50 cents to 5 dollars until he has enough to purchase an animal which he then tries to resell for a profit. It is understood that the profit made is divided according to the initial "shares" invested. This was considered by those who engaged in it to be slow and risky business netting a small return; nevertheless, sometimes enough to purchase tea, cigarettes, tobacco, or sugar.

compound head who consigned the compound and family herd to his younger brother, moved from the zone to Dahra and changed his profession from full-time herder to full-time dioula. He was also able to become peripherally plugged into SODEVA's buyer of bulls and district herdsmen sellers. In other words, he was the broker who collected his fee from the buyer. Another village chief has also become a full-time livestock trader, but he and the first mentioned village chief only trade in cattle and spend the entire day at the cattle market which is located in the large space in front of the veterinary post where is also situated the bore-well and watering troughs. Cattle from all over the district are traded here and buyers come from as far away as Dakar. Many of the buyers are themselves dioula who will buy at Dahra and resell to retail butchers. For compound heads a full-time dioula is as respectable an occupation as one can expect outside of strict herding (Deckvotters also disdain hiring themselves out as shepherds). For these two village chiefs who now work full-time every day as dioula, their jobs now take them into Dahra everyday where they are constantly interacting with people who are not necessarily Fulani (these were the only two compound heads/village chiefs with a son each in the French-speaking primary school at Dahra). They staked themselves which is usually the way a serious dioula begins. He usually begins with capital gained from the sale of a bull or even a horse and with this initial capital he begins to buy and resell for a profit.

The itinerant livestock trader was the more usual type found at Deckvotte. They were usually never compound heads, rather, they were the younger brother of the compound head and in charge of the family herd or junior brothers who aided in transhumance or with cash crop farming. Unlike the full-time dioula, these younger itinerant dioula were most often at the sheep and goat market which was in the heart of town not too far from the bush taxi station. Some herd managers engaged in livestock trading during dry season transhumance when they were near large markets. Again, this was an itinerant activity. The one compound head who worked as an itinerant dioula stated that he started in 1972, as a trader in sheep and chickens and that during the rainy season, he works on Mondays which is the market day for farmers, and works everyday during the dry season. He lost all but eight cattle during the drought so began to explore ways of meeting his household expenses without selling one of the remaining cattle. This man was interviewed in his compound and several compound members were present, males

and females. There was constant snickering and soft laughter as he described his buying and selling activities, particularly of chickens. In Wolof, a man who sells chickens is called a baye ganaar which literally translates as father chicken. Those laughing at the idea of his new economic activity kept whispering "baye ganaar, baye ganaar," so finally, intrigued by this teasing, I asked one of the women what was so funny and she stated that "it is not very Fulani to sell chickens - Fulani are pastoralists.

The snickering and laughter were part of an attitudinal response pattern that fell within the gap between the prevailing ideological and value system and a changing economic subsistence system in which Fulani of Deckvotte were saying one thing and doing another - in which it was still strongly stated that Fulani are herders and consider other production activities alien to how a Fulani is defined, but at the same time these Fulani were engaging in increasing numbers in income-producing activities which were common to other ethnic groups.

Trade in amulets and medicines was described as being the exploitation of ancestral knowledge of the healing power of Islamic verses, medicinal herbs, plants, and tree barks and roots.[49] One compound head and three household heads started selling amulets and medicines in 1971 in Dakar and the larger towns such as Kaolack and Saint Louis, and as far as the Gambia. This is a dry season occupation whose primary market is farmers who have money after the peanut trading season closes in January through March. The compound head engaged in this selling had confided the family herd to the son of his older sister who lived in the compound of the compound head with his wife and children. The compound head was, therefore, free to work as a "traveling salesman" beginning in January and returning to the residence periodically to purchase provisions, leaving again, and returning in late June to begin planting the millet and peanut crops. The son of his older sister transhumes every year with the herd.

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[49] Ames (1962:46,46f) discusses Fulani "medicine" men in the Gambia who sell magical charms and amulets to Wolof farmers during the dry season.

Petty trade in dead wood gathered in the zone for sale in Dahra was engaged in by whim mostly by young men, many unmarried. The wood was sold by the cartload for 200 CFA francs to local bakers and housewives. While the young men interviewed considered gathering a cart of dead wood more work than it was worth, it provided a little spending change for cigarettes, tobacco, and tea.

Deckvotte: Conclusions and Recommendations:

All of the above mentioned non-herding income-producing activities were considered by Deckvotters to be temporary measures against further decreasing their herds and engaged in at that point in time because of poverty; yet the emergence of these activities as modified production behavior heralds the beginning of changes in subsistence behavior. The zone trend is toward increasing sedentarization. There is the obvious investment in more stable living structures and the investment in the agricultural production system of peanuts which has modified movement in the territory for the animals. Attitudes are also very important as illustrated by the expressed desire for capital improvement in the form of the laying of pipes for a year-round secure source of water from the bore-well at the center to Deckvotte. The fact that farming has modified their territory indicates some modification in attitudes concerning the territory. There were several discussions about the problems of farming with animals in such close proximity to the plots and there were several incidents of mild confrontation between some zone residents because of damage to millet and peanut fields by herd animals. Increase sedentarization and more extensive farming will require more constraints in terms of movements of herd animals.

Transhumance, according to the residents of the zone, is a traditional mode of behavior which they do because their ancestors did it. Confronted with the question of whether or not they would remain in the zone all year round if there were sufficient watering holes and year round fodder in the form of grasses preserved with salt, three household heads stated that it would not be fitting for a Fulani not to transhume. The others wholeheartedly embraced the idea of rudimentary hydraulic development and year round fodder which they stated would bring about the ciscontinuation of long distance transhumance from the zone during the dry season. The initial assumption on their part was that the government would be responsible for this development, so when I suggested that they might want to assume responsibility for the

cutting, transporting, treating, and storing of these grasses, several legitimate points were raised as barriers to the success of such a project: (1) lack of manpower, (2) lack of enough grasses in the area from which to obtain this surplus, (3) lack of tools and equipment for cutting, transporting, and treating, (4) lack of storage bins and knowledge of how to construct them; and (5) lack of knowledge of preserving techniques. Several Deckvotters had observed this technique of preserving grasses at the CEZ where the grasses are stored in cement bins dug into the ground and one Deckvotter stated that he had observed this technique at Labtar, a town north of Dahra which has a livestock improvement station. There is a demonstration livestock project in Sine Saloum which also utilizes this method. The popular introduction of this method in the district would remove one of the primary reasons for dry season transhumance from the zone. Rada and Neville Dyson (1970:122) have suggested that an alternative to transhumance for the Karimojong Fulani of Uganda would be grass fodder within their territory, but they raised some of the same worrying points as did the Deckvotters. They were, however, describing a method using dry grass. Stenning (1959:243) also discusses the possibility of providing food and water contained within the territory for the Wodaabe Fulani of northern Nigeria making it unnecessary for them to continie dry season transhumance.

Deckvotters seemed interested in 1976 in modifying their subsistence behavior concerning the discontinuation of long distance transhumance, but felt that the actual materialization of a way to do this lay outside their capabilities. While they warmed to the idea, its operationalization belonged in the abstract.

It is precisely long distance transhumance which provides the market outlets for milk surpluses and even the sale of animals - not necessarily herd animals - but the opportunity for herd managers who wish to work a few hours or days as a dioula in the cattle market of whatever area in which they have set up transhumance camp. If a sizable portion of food for herds can be secured through conservation and preservation of grass within the district, dry season transhumance would no longer be necessary, but the marketing system which complimented securing food and water for the herds would be lost.

A development alternative would be the introduction of dairy techniques by beginning with the treatment of

milk by Deckvotters themselves with the aid of technical assistance from rural extension workers trained in these techniques and assigned to the zone. Once this is accomplished surpluses could be transferred from central points in the zone to refrigerated trucks destined for factory outlets such as Saprolait or Senlait which are outside Dakar. Enormous barriers prevent this type of development in the near future, for example, a road network in the zone is nonexistent, but more importantly, the existing dairy marketing system in the country is not responsive to the internal dynamics of supply and demand. Berniard and Lavenant (1976:128) show that the dairy needs of Senegal are almost entirely satisfied by importation which presently represents each year two million CFA francs; but since the installation of the factories which sterilize and homogenzie milk, and make yogurts and condensed milk, imported products have dropped in quanity. The dairy factories in operation do not service the district of Dahra, but Deckvotters expressed their desire that their surplus milk be channeled into an outlet such as the factories of Saprolait or Senlait. Alione Kane expressed that it would be possible for SODEVA to provide the rural extension services necessary to provide the technical skills needed in the initial treatment of milk, and insyructions in how to prepare yogurts and even cheese. Of course, this is all possible only if monies for personnel, equipment, and vehicles are allocated -- in other words -- if a commitment is made at the national level based on the successful articulation between, for example, the needs of Deckvotters and other zones in the district for dependable markets and the national desire to significantly lower dairy importation by concentrating on the development of the livestock sector of the economy.

CHAPTER FOUR

FIELD PROFILE: SENEGAL DELTA REGION

Geography and Climate

The Senegal River Delta is an almost featureless plain devoid of all but the sparest vegetation. It owes its formation over the last 15,000 years to the retreat of the sea from a natural gulf, under pressure from progressive alluvial deposits brought from the interior by the river (*Diagne, 1974*). The soils of the Delta are heavy, high in clay content and laced with salt. There is some disagreement as to whether the salt is a legacy from the Delta's formative period or a continuing contribution of a salt water aquifer that may or may not underly it. In either case, barring an expensive operation flushing the salt out of the soil, the high salinity of the soil has foreclosed cultivation of all but one-twentieth of the total 188,000 hectare Delta area (*Audru, 1966*).

Rainfall is sparse and undependable in the Delta. The average annual rainfall for St.-Louis, at the south-west extreme, was 323 mm between 1944 and 1973. In Dagana, at the north-east extreme of the Delta, it was 297 mm over the same thirty year period (*Diagne, 1974, p. 188*). During the rainy season of 1976, that is, the rainy season the author spent in the area, the administrative district of Ross-Bethio, which includes the Delta, recorded 212.3 mm of rainfall.

History and Ethnographic Configuration

The Delta was once part of the Walo Kingdom, the Wolof state that in the pre-colonial era sat astride the lower Senegal River. During an extended period of Walo retreats under assault from the Moors to the north, the Walo kingdom was able somewhat to insulate the other Wolof states to the south from serious Moor incursions. Before the installation of sedentary cultivators which accompanied S.A.E.D.'s developement of irrigation works in the mid-1960's, the main population of the Delta consisted, however, of various Fulbe groups. A smaller, but still substantial, group of Moors also inhabited the area. Few Wolof were residents of the Delta interior.

Prior to 1964, the occasion of the construction of a protective dike along the Senegal River at the northern

extreme of the Delta, the Delta was virtually uninhabited. The village of Boundoum Barrage, created just before World War I by the colonial authorities, was the only permanent agricultrual settlement in the area. Otherwise, the Delta was inhabited primarily by several groups of transhumant pastoralists and a half a dozen fishing villages. It suffered from an annual post-rainy season river crest, which inundated it during October and November. By January, however, the retreat of the high waters left the Delta subject to salt water infiltration, especially at high tide.

The town of Ross-Bethio is at the mid-point along the paved road from St.-Louis to Rosso, Senegal, the most downstream ferry crossing on the Senegal River. Ross-Bethio, formerly the seat of an important hereditary official of the Walo kingdom, is today still an administrative center of certain importance; it is the seat of government of Ross-Bethio district, one of three such districts in the Department of Dagana. At the same time it is a convenient reference point for the zone of Kassak. Kassak Nord is 22 kilometers northeast of Ross-Bethio, along a dike beginning at the northern extremity of the latter, leading to Ronkh on the banks of the Senegal River. Kassak Sud can be more easily reached by continuing about 16 kilometers north of Ross-Bethio on the paved road, before turning into the Delta on a dike to travel the remaining 8 kilometers. By dike, the distance between the two villages is 6 kilometers. Wading across the Kassak Creek -- or driving across it toward the end of the dry season -- and crossing the fields reduces the trip to 2 kilometers. A half a dozen Fulbe hamlets, their number and location varying to some degree according to the season, are scattered along a 10 kilometer stretch of the paved road beginning at the Kassak Sud turn-off. Most of the Fulbe residents are participants in irrigated cultivation as well.

Kassak Sud was settled just before the rains began in 1966 by approximately 200 families of Senegalese veterans of the French and Senegalese armies. The veterans, who had been pressuring the government to show its gratitude for their public service, were attracted by government promises of ample housing, generous subsidies, a full range of social services and the means to a secure livelihood. Many veterans had witnessed the conditions of European peasant life during their military service. They felt tempted by the possibility of a comparable standard of living for themselves. These veterans came from all regions of Senegal and almost every ethnic group living in the country has representatives in the village. The largest single ethnic representation is Tukulor. The Tukulor homeland abuts the Walo kingdom to the

east. The Wolof are not as numerous as the Tukulor. The Wolof in Kassak Sud have come more often from Njambour -- the area around the city of Louga -- and the area around Thies, than from the Walo areas adjacent to the Delta. A number of people have come as well from the Casamance area of Senegal to the south of the Gambia. They and several of the somewhat fewer Serer from the Sine-Saloum region in the center of the country, form the village's Christian community. Otherwise, all the residents of Kassak Sud are Muslim. Wolof is the lingua franca of the village.

Relatively few of the family heads in Kassak Sud are World War II veterans. The bulk are veterans of the Indo-Chinese and Algerian Wars. This means that the age pyramid for males in the village is skewed in favor of 40 to 55-year olds. Few men are older than 60, and few are between the ages of 20 and 40, unless they are recent arrivals come to replace departees.

Kassak Nord was also settled originally just before the rains began in 1966 by approximately 200 families. At the present time, the settlers are 95 percent or more ethnic Tukulor from the Department of Podor. When originally organized, the village also incorporated some overflow of veterans unable to settle in Kassak Sud. Virtually all non-Tukulor settlers in this group -- mainly Serer -- have since departed.

The most striking social characteristic of Kassak Nord is the pattern of caste affiliation of its inhabitants. Tukulor society is, as are all major Senegalese groups outside the lower Casamance, stratified. On the dominent level are the free castes. They include not only a nobility which oversees large estates, but also a large group of clerics which have superceded the political power of the nobility in the past two centuries; and a much larger body of commoners, many of whom are quite impoverished. Below the castes of freeman are the castes of artisans. Their members may be smiths and jewelers, weavers, wood workers, praise-singers, troubadours or buffoons. The lowest stratum is reserved for the captive castes (*Boutillier, et. al., 1962; Diop, A.B., 1965; Diop, M., 1972*). Over two-thirds of the households polled in Kassak Nord were members of one or another artisan caste. The most common free caste encountered were fishermen. Other than the fishermen, only four free families were found in Kassak Nord. Although a number of clerics reportedly have rights to cultivate in the polders, all but two were absent during the period of field work. In short, Kassak Nord became a refuge for members of dependent castes who, freed but also abandoned by the erosion of the caste system under oblique assault by the colonial system, hoped to acquire

permanent access rights to secure, bountifully productive resources. Many of the recruitees to Kassak Nord came from villages along the Senegal River near sites that had experienced the development of small polders under governmental agencies comparable to N.A.S. in the 1950's and early 1960's. While they were not cultivators in these projects as a general rule, that they were witnesses to their possibilities whetted their interest.

Fewer Fulbe live in the zone than do peasants in either Kassak Nord or Kassak Sud. The number varies somewhat from year to year and from season to season. The cooperative of Kassak Sud Peulh -- the organization that groups all the pastoral Fulbe participants in S.A.E.D. operations in the zone -- recognizes 176 family heads as members. Several of these members do not live in the zone. The pastoral Fulbe form three communities. The Jallobe group themselves around Keur Mamadou Koumba. By early 1977, they were only tentatively cultivating tomatoes in the S.A.E.D. polders in the zone and were not yet members of the cooperative of Kassak Sud Peulh. A Hururbe group contributes about three-fifths of the cooperative membership. They center themselves at Nadiel but also occupy satellite hamlets according to local conditions. They claim their families have been in the area since the period of Serer occupation about 600 years ago. The third Fulbe group is the Jerbe-Jerbe, a group claiming kinship with the Jallobe. They migrated to the middle Delta approximately 35 years ago from an area farther south-west, closer in Giladou but, like the other groups, may be dispersed in satellite hamlets according to local conditions and the rhythms of the annual production cycle. S.A.E.D. probably regards all Fulbe as members of one extended family and has prescribed one cooperative structure to group both the Hururbe and the Jerbe-Jerbe. There is however, considerable tension between the two groups and the S.A.E.D. fiat is the only force preventing the cooperative from rupturing. The Hururbe look at the Jerbe-Jerbe as interlopers restricting the share of resources at their disposal. The Jerbe-Jerbe look at the Jururbe as hopelessly mired in outmoded modes of production, unwilling to take advantage of the new opportunities available. The age and sex pyramids of these Fulbe settlements is quite normal for Senegalese Fulbe (*Hervouet, 1971*).

A Developmental History of the Delta Region

S.A.E.D.'s program for the hydro-agricultural development of the Senegal River Delta, is the contemporary

offspring of probably the most ancient, although not necessarily the most distinguished, lineage of institutional attempts to promote development of an African region within the global economic system. Since the decline and subsequent disappearance of the slave trade following the treaty settlements closing the world war of the Napoleonic era, these attempts have centered on some form of agricultural development of the area.

By the early 1820's, the French island outpost of St.-Louis in the mouth of the Senegal River had reached an agreement with the rulers of the Walo Kingdom, its neighbor on the adjacent mainland, permitting it to organize a plantation agriculture colony at Richard-Toll, 115 kilometers north-east along the river. This experiment was dismantled in 1831. By then, it had compiled an impressive chronicle of agronomic trials, but foundered on problems of manpower shortages, quarrels with local residents over tenure rights and the periodic necessity of confronting marauding Moor warriors (*Hardy, 1921; Barry, 1972*).

As early as 1918, a certain M. Henry was proposing the development of mechanized rice cultivation in the Delta. Although it was well-known that Delta soils often attained salinity levels of 18 grains per kilogram (*Papy, 1952*). Irrigated rice cultivation in the Delta did not, however, get under way until the Mission d'Amenagement du Senegal (M.A.S.), created by the colonial government in 1938, began to implement its program. At the close of World War II, the colonial government, impressed by the penury of food resources experienced in Senegal during the hostilities, directed M.A.S. to pursue mechanized rice cultivation in an irrigated perimeter constructed for that purpose in the Delta.
By 1957, M.A.S. had been responsible for the construction of four cultivation centers in the Richard-Toll area. They made a total of 6,000 hectares available for mechanized agriculture.

The project was constantly bedeviled by difficulties that culminated in prices for domestically produced rice that surpassed the prices of imported rice in Dakar. Productivity was never high and the technical execution of the works left much to be desired. Supervision of field labor and maintenance of the machinery and works were haphazard. Administrative direction was unstable and inconsistent. The Senegalese government decided to liquidate the project in 1970 (*Diagne, 1974*).

S.A.E.D. was created and its organization established by a series of laws and decrees in early 1965. From

the beginning, S.A.E.D. was charged to develop land for intensive agricultural exploitation, to control, transform and market produce grown in its exploitations and to promote cooperative organization and cooperative discipline among the peasants working therein (*Republic of Senegal, n.d.*). It is defined as a "public establishment" in Senegalese law, a cooperate persona of special public right given its own endowment and financial automomy and not benefiting from any private participation. Its operations are overseen by the Ministry of Rural Development and Hydraulics, its patron ministry, as well as, as are all public establishments in Senegal, by the Ministry of Finance. No payments above a certain sum can be made by S.A.E.D. without prior approval of the Controller of Finance (*Republic of Senegal, n.d.*).

During 1965 and 1966, S.A.E.D. created five villages in the Middle Delta, among them Kassak Nord and Kassak Sud, to cultivate the natural depressions in the area that it had improved technically with an eye toward irrigated cultivation. Since that time, the irrigation works have evolved through three levels of technical refinement. Throughout the Delta perimeter, the tertiary works have emerged out of the lower technical levels, as the on-going drought has been challenging the abilities of the existent works to foster adequate harvests.

The primary works consist of an 85 kilometer protective dike along the left bank of the river from the village of Thiagar to the mouth of the Gorom Creek, built in 1964 under M.A.S. auspices. This dike was designed to protect the Delta from the floods of post-rainy season river crest and from salt water infiltration during the river's ebb. The primary works also include the construction of sluice gates at seven points along the dike, at appropriate intervals, to control the entry of fresh water in the cultivated depressions while forbidding the entry of salt water during the period of fresh water recession. The primary works, while protecting the cultivated areas from flooding, still left successful cultivation essentially dependent on the vicissitudes of annual rainfall for germination and maintenance of the crop, until the river crest reached the level where it could be used for submersion. Yields in the primary works hovered between 9 and 10 quintals per hectare (*Diallo, 1975*).

By 1966, the first secondary gravity works were being developed in the Delta area. The secondary works concentrated on subdividing the cultivable areas and converting each unit into a polder. In each polder there is no more than a 25 centimeter difference between its highest and lowest points to diminish the difference in the depths of

submersion, that would otherwise drown some plants while leaving others completely dry. Profiting from the relative levelness of the terrain, the secondary gravity works have only one canal at the lowest point at the periphery of the polder, for both irrigation and drainage.

The main drawback of the secondary gravity works has been that the level of submersion in the polders remains a function of the height of the river crest. The particularly low crest of 1968 permitted cultivation of only 10 percent of the improved land that had been seeded. S.A.E.D. attempted to solve this problem with the construction of three major pumping stations, designed to pump water into canal systems that irrigate 98 percent of the polders in the Middle Delta. The pumps require only one meter of water in the Senegal River for proper operation. The secondary works with pumping or, as they are also called, the improved secondary works, are therefore able in principle to assure proper submersion of rice under almost all river crest conditions (*Diagne, 1974; Maiga, 1976*). Yields from these works have averaged in the range of 15 to 18 quintals per hectare (*Diallo, 1975*).

Supplementing the secondary gravity works with pumping stations at the entrance to the main canals has not resolved other drawbacks of the secondary works. The 25 centimeter gradient between the extreme points in a polder is still too great to insure proper submersion of all the rice in the polder. Use of the same canal for irrigation and drainage has limited the repertoire of possible irrigation operations. For example, it has been impossible to accomplish the rapid irrigation and drainage sequence known as pre-irrigation under these conditions.

The tertiary works, currently the most refined in the S.A.E.D. inventory, are designed to solve these problems. The tertiary works consist of a dense network of small dikes and canals that divide a polder into a number of parcels, each of them measuring three to five hectares. The gradient between the extreme points is no more than 10 centimeters. There is a separate drainage and separate irrigation system. Water enters the parcel at a high point and leaves at a low point. The first tertiary works were a short distance from Kassak Nord. Yields there reached 35 quintals per hectare (*Diallo, 1975*). Each plot in the tertiary works is hydraulically independent. The network of plots in a given polder is linked to a pumping station which allows the polder "complete mastery of water".

The Senegalese government early focused on the Middle Delta for development for several reasons. The area

is close to main lines of communication. The paved road linking Dakar with Nouakchott, Nauritania, passes along the higher land that limits the flood plain on the southern fringe of the Delta. The population was sparse, only 5.2 inhabitants per square kilometer in 1964 (*Hervouet, 1971*). Since cultivation was virtually unknown in the area, the otherwise nagging problem of confronting the structure of local land tenure might be avoided. It seemed at the time (1964) that a dike protecting the Delta from flooding was all that was needed to launch Senegal into a profitable irrigated agriculture venture. It appeared that under-utilized labor from other parts of the country could be attracted to the Delta, to begin to translate the resource potential of its under-utilized land into a benefit for all concerned.

The installation of S.A.E.D.'s peasant farmers apparently shocked the local Fulbe communities. They report that, in early 1966, S.A.E.D. agents visited the Fulbe hamlets to inform the local population of the impending settlement of some 400 peasant families, on what had been prime Fulbe dry season pastureland. The local Fulbe had been practising a transhumant pastoralism, oscillating between rainy season movements to the grasslands to the south out of the river flood plain, and dry season movements back into the flood plain, in their case into the Delta. At a time when the grasses, seasonal watercourses and natural depressions had withered and gone dry to the south, the river crest was just beginning to recede in the Delta leaving behind it fresh grass and fresh water impounded in other natural depressions. Unfortunately, it was precisely those areas of fresh water impoundment and luxuriant grasses in an otherwise barren plain that most interested S.A.E.D.

S.A.E.D. presented the Fulbe with the option of cultivating alongside the peasants under the S.A.E.D. aegis or abandoning their holding in the Delta altogether, to continue a purely pastoral existence farther south, permanently located in the area of their wet season pastures. According to the National Domain Law of June, 1964, and its clarifying decree of the following month, ownership of all untitled property reverts to the Senegalese government. The person or group exploiting any given land parcel is guaranteed the right to continue to exploitation of the parcel until the death of the person or dissolution of the group. If, however, the government determines -- as many governments, including the Senegalese government, have accorded themselves the right to do -- that the parcel is not being exploited in the optimal interest of "society", it may displace the parcel's occupants in the name of the interests it represents. The Fulbe in the zone of Kassak opted, when faced with the application of these

provisions of the National Domain Law to their dry season pastureland, to retain access to their former domain by sharing the polders adjacent to Kassak Sud with the veterans. Nonetheless, they are now obliged to maintain their herds, at great inconvenience, away from their settlements considerably to the south along Lake Guiers even during the dry season. To do this has meant the detachment of unmarried adolescent men to supervise the cattle. This has led to overgrazing in many areas of the Lake Guiers fringe and frequent quarrels, as the tensions of competition for dwindling resources are compounded by the absence of mollifying adult surveillance.

Village Profiles: Kassak Nord and Kassak Sud

Kassak Nord and Kassak Sud each contain 202 numbered identical houses. The 404 houses each contain two rooms of identical dimensions, an east room and a west room. The longitudinal axis of the houses is oriented east-west. The entrance is through the northern wall of the east room. The east room has one window measuring 50 centimeters by 50 centimeters on the south wall. Likewise, the west room has windows of those identical dimensions opposite each other on the north wall and the south wall. The exterior dimensions of the house are seven meters by four meters. The roof, sheets of corrugated fibro-cement, slopes from 3.33 meters on the south side to 2.5 meters on the north. The roof is extended over the door in the north-east quadrant to form a small overhang. The walls of the houses are made of cement and local sand and gravel. The high salt content of the latter has led to crumbling in many of the houses. The walls are covered with a skin of cement that seems once to have been painted either yellow or beige. The often crumbling floors are similar to the walls in composition. The weight of the roof is carried by six pillars of reinforced concrete placed in the corners of the house and at the mid-points of the north and south walls from where the room-dividing wall departs.

The houses are placed in regular rows on rectangular lots about 15 meters by 9 meters, staggered one behind the other like squares on a checkerboard. The houses tend to be placed at the south-west corner of the lot, but this varies. There are a few vacant lots in each village, more in Kassak Nord than in Kassak Sud. Each village has several broad avenues, often given such sardonic appelations as the Corniche -- the Boulevard de l'Independance of the Champs-Elysée, by the young men. These avenues would be difficult to distinguish but for the pattern of disposition of houses on either side. There are a few trees in Kassak Sud but little grass in either village.

The ground is a sterile layer of heavy clay into which people, automobiles and animals sink several centimeters in the rainy season. The rains transmute the villagescape into a patchwork of house-islands, connected by a system of criss-crossing clay and straw causeways that permit passage across the mire. As the waters retreat, they leave a ragged moonscape in which the castings of feet, hooves and tires, mementos of the rains, are baked into the street by the unrelenting dry season sun. A film of salt caps the mudpeaks.

Kassak Nord has approximately 800 hectares of improved land at its disposal. The fields are divided into twelve lots of approximately equal size, all furnished with secondary works. The conversion to tertiary works is scheduled to be under way at the present time. The nearest lots are just a few hundred meters from the edge of the village. The most distant are two kilometers away. Kassak Sud has approximately 400 hectares of improved land at its disposal. The fields are divided into three large polders. Conversion of the first polder to tertiary works was completed by September 1976. Conversion of the second was to follow in early 1977. The destiny of the third and largest polder seems unclear. It will probably never undergo conversion to tertiary works. The peasants accuse the engineers of calibrating the level of the pumping station at the head of the main canal, so low it cannot pump water up to the third polder, 0.2 meters higher than the other two. The engineers reply that the bottom of the third polder is too sandy to use water economically in multi-season irrigated cultivation. Trucking in clay to make the polder serviceable would be prohibitively expensive. The first polder is about a half a kilometer from the village, while the third is three to four kilometers distant just next to Nadiel, the main settlement of the Hururbe Fulbe. All the improved land in the zone of Kassak has a serious salt problem. Kassak Nord, judging from yields and generally held public opinion in the area, seems to have a more serious problem than Kassak Sud.

Kassak Sud has a more prosperous appearance than Kassak Nord in many ways. Many more householders in Kassak Sud have constructed thatch enclosures at the limits of their houselots. Almost everyone there has a latrine and a shower stall within the enclosure, usually along the southern wall of the house. There may be a mud-brick outbuilding or two within the enclosure providing sleeping quarters for a second or third wife or half-grown children, as a kitchen or as a shelter for a few domestic animals such as goats, sheep, donkeys or even horses. In Kassak Nord, the most common annex to the project house is a thatch or mud-brick shelter built as an anteroom, befor the entrance to the house in the

north-east quadrant. Few people have enclosed their house lots. Other construction is rare.

Very few adults in Kassak Nord speak French. Few of their children go to government school although all their children, girls as well as boys, spend time in one of five village Koramic schools. The veterans of Kassak Sud encourage their children to finish primary school and then send them to Kakar, Thies or St.-Louis to follow the secondary school cycle as far as they are able. A son of one of the local residents spent several years in the United Kingdom doing graduate university study in English language and literature. Many of the children of the veterans anticipate a career in the urban areas of Senegal, rather than in the perimeters of S.A.E.D. They more often look for spouses in their parents' home areas than do the children of Kassak Nord. This may be as much the product of the ethnic heterogeneity of Kassak Sud, as of the extra-local career ambitions of the young.

The Fulbe hamlets are groupings of up to a dozen households planted in barren soil not far from some line of motor transportation, either a paved road or a dike. The sites are generally covered with animal droppings. They are inundated during the rainy season but remain devoid of vegetation. Each household inhabits a group of thatch dwellings, one for each adult member. The members of a given household are generally close kin. The household dwellings form a crude circle which is separated from other similar households by a certain distance. The dwellings, built by the women according to their personal tastes, are eliptical structures slightly under two meters high in the center with an entrance at one end. They are generally five to six meters long. The frame is made by lashing together branches and twigs gathered in the bush. The thatch covering in a well-built dwelling is impermeable to rain. In fact, people spread plastic sheets between the frame and the thatch over their sleeping platforms to protect them while they are sleeping. The sleeping platform is an inevitable feature of the far end of the dwelling.

In each Fulbe hamlet there is an enclosed area set aside for prayer. All the Fulbe of the zone claim to be Muslim, although their Islam is of somewhat an idiosyncratic stripe. There are also several enclosed areas that serve as corrals for cattle or sheep and goats, especially during the rainy season, when many of the cattle are kept in the hamlets to permit the residents to benefit from the ample milk supply at that period. Other than the corrals, all structures in the hamlets are made of thatch.

Social Organization and Production Behavior

1) The social organization of work: Hochet (1972) maintains that the critical question to be resolved in an irrigated agriculture project is the social organization of work. The author of this paper certainly agrees. Without proper attention to the social organization of work, the peasant's role risks reduction to that of a salaried industrial worker as Founou-Tchuigoua (1975) found in the Gezira scheme. In fact, the role of the peasants in the zone of Kassak is comparable with that which Founou-Tchuigoua (1975) describes. It is, moreover, the very precarity of such a role, given other forces that restrict peasant revenues to an insufficient range, that brings the peasant to perform only seasonally in the company theater.

The articles under which S.A.E.D. was formed directed it to promote the organization of and conduct its dealings with producers through cooperatives. This cooperative organization has been imposed by S.A.E.D. It is not an organic outgrowth of the organizational needs of peasants active in a particular mode of production. The main purpose of the cooperatives is to optimize the return of the operation.

In the first stage of their development, the cooperatives were non-segmented organizations whose field of interest was entire polders. Each cooperative was directed by a president and a board of directors elected by the general assembly from among its members. The cooperative contracted with S.A.E.D. for delivery of mechanical cultivation services and for delivery of material such as seeds, tools and fertilizer. S.A.E.D. used the cooperative as an intermediary when it had communication with the peasant farmers. The cooperative was a corporate individual, capable of acquiring credit for its members from the Banque Nationale de Development Senegalais (B.N.D.S.). The cooperative, under supervision of S.A.E.D. extension workers, was responsible to S.A.E.D. for distributing the land, to oversee punctilious execution of cultivation, to reimburse its credit to the B.N.D.S. -- and to S.A.E.D. after the B.N.D.S. cut off further credits in 1969 -- and to surender its entire marketed production to S.A.E.D. Unsegmented cooperative organization led to problems which, in the last few years, have impelled S.A.E.D. to mount a re-organization of the cooperatives to accompany the extension of the tertiary works.

At times, the cooperatives arbitrarily included several distinct groups in the same organization. Until 1975, the Hururbe and Jerbe-Jerbe Fulbe were members of the Kassak Sud cooperative for reasons of S.A.E.D. convenience. The land

they exploited was in the polders of Kassak Sud. In 1975, S.A.E.D. split the two Fulbe groups off to form the Association d'Interet Rural (A.I.R.), a pre-cooperative organization, of Kassak Sud Peulh. As mentioned above, there has been a lot of turmoil in the A.I.R. since the two Fulbe groups are incompatible, despite their apparent affinity.

In other words, S.A.E.D. imposed a cooperative structure on people who did not necessarily recognize common interest. This has proven especially true of the settler villages of Kassak Nord and Kassak Sud. There has been no basis for mutual confidence, social relations not having endured beyond two generations at most. The officers have often taken cooperative decisions with little participation of the membership. Factions developed. The cooperative of Kassak Sud split in 1971, over whether the treasurer could or could not account for all the money generally believed to be in the cooperative treasury. In Kassak Nord, two splits occurred over who was to be excluded from access rights to the polders for absenteeism and/or nonreimbursement of debts.

Of course, eroded confidence in the cooperative leadership aggravated the already serious problem of debt repayment. S.A.E.D. retained the right to demand that the cooperative expel members who did not reimburse their debts. But, as in the case cited above, cooperative leaders were often reluctant to acquiesce. They could not very well expel kin, affines or political supporters. Moreover, most cooperative members were guilty of the same crime at one time or another.

The heavy use of mechanical cultivation techniques has left the peasant producer seriously under-employed. He has to work only 40 days a year for his rice crop and, if he chooses to cultivate off-season, 120 days on tomatoes. Most of the work has been performed by machine. Maiga (*1976, p. 432*) sums up this aspect of the problem: "S.A.E.D.'s actions in the domains of production and commercialization are so prepondrant that the cooperator played only an insignificant role... The role of the cooperator is reduced to seeding, eventual weeding and harvesting."

In the unsegmented cooperative, members drew lots under the supervision of the extension agents that S.A.E.D. had assigned to the cooperative, more or less annually, for the location of their plots. The size of the plots depended on the number of economically active adults in their households. A family could find its plot staked out in the middle of the polder, in which case members would wade through the chilly water of December mornings for the final cultivation operations

of the season. Each family cultivated its rice plot individually, although there was a certain degree of informal cooperation among small groups of families. Tomato cultivation has been, however, from its beginnings in Kassak Sud in 1969, a cooperative effort. By 1971, the group cultivating tomatoes in Kassak Sud had grown to about 150 members. At that point, the tension inherent in the heterogeneous composition of the village broke into four years of internecine squabbles over treasury accounts. Since 1971, the tomato producer's group has split several times. Now both tomato production and rice production are done in relatively small producer groups.

The subdivision of the polders of the secondary works into the smaller plots of the tertiary works, has facilitated the producer group reorganization of the cooperatives. The first producer groups were created in Boundoum Nord, near Kassak Nord, in 1971 (*Cissoko, 1974*). Each producer group contains twelve to fifteen family heads, meaning forty to fifty economically active adults. The group plot is ideally large enough to allow each economically active adult one hectare of cultivable land. Each family head has attributed to him, for the purposes of debt engagement and revenue calculation, a parcel according to his family size within the group plot. The technical unity of the group plot comes from its position in the hydraulic meshworks. The group has autonomous access to water and dry passage to its plot wherever it may be within the polder. Its members must cooperate to a great degree to see that all member's needs, especially water, are satisfied, although they need not, and rarely do, work the group plot collectively.

Producer groups were first introduced in anticipation of the conversion to tertiary works in Kassak Sud in mid-1976. After S.A.E.D. had relayed to the cooperative the principles of the cooperative group reorganization, several members of the cooperative spontaneously undertook recruiting other members with whom they had some affinity into a group. The motivating affinity was first, kinship; second, ethnic background; and third, caste, village of origin or /E/o or less frequently, a neighborhood of Kussak Sud. The group elected a president who was not necessarily the man whose efforts had brought the group together, nor was it necessarily a senior man. Several groups chose young men with reputations for probity and hard work. The president's responsibilities are to set work schedules, enforce work discipline and act as an intermediary between the producer group and the home cooperative. In principle, the composition of the groups and the plots they cultivate remain stable for the indefinite future. They will continuously cultivate the same plot in an arrangement approaching

ownership (*Cissoko, 1974*). Neither projection seems a likely prospect, especially if the recruitment of intergenerational succession are taken into consideration.

The advantage to the peasant producer in organization by producer group, is that he may be able to reduce his debt as a secondary benefit of group cooperation. It may be possible for groups to rely more and more on animal traction to accomplish cultivation operations. Use of animal traction will not only decrease farmers' debt obligations for mechanical services delivered by the company, it will also decrease under-employment. It will substitute a labor intensive for a capital intensive method of cultivation. The peasant will also do certain operations he has never done before, preparing the bed for sowing, transplanting rice seedlings in rows and caring for the canals and birms in his sections of the hydraulic meshworks.

The advantages of S.A.E.D. reorganizing production into producer groups, lie in the possibilities of increasing productivity and production and in better debt repayment. Cissoko (1974), the director general of S.A.E.D. from 1971 until early 1978, is confident that group solidarity acts as a pledge for work well done as well as for debt repayment. The scale of the group is small enough that its internal dynamic can unfold on small group principles (*Mills, 1967; Homans, 1950, 1961*). Its membership combines in a manner that fosters group solidarity. It becomes in the interest of each individual member to pursue the interests of the group. In principle, he will do his work well because the welfare of his closest associates, as well as his own, depends on it. He will pay his debt, otherwise S.A.E.D. will make his closest associates tax themselves to pay it. In practice, some of the groups in Kassak Sud worked well while others did not. Some, as a group, executed their work haphazardly and would not pay their debt. Absenteeism did not diminish. In a solidaristic group, close associates will "cover" for absentees in rotation. In this way, producer groups may even facilitate absenteeism. S.A.E.D. will probably try to have the miscreant groups and itinerants expelled from rights in their respective perimeters. The process had already begun in Kassak Sud in early 1977. The new organization makes it easier for S.A.E.D. to police the labor in its tertiary works and to get the yields and the debt repayment which will enable it to balance its accounts and justify the extension of its domain to the international financial community upon which it depends.

2) Natural limitations on the productivity of the zone of Kassak: Three factors, the salt in the soils, the soils' heavy clay content, and pests limit the productivity

of the irrigated perimeters, as well as alternative activities in the zone of Kassak and in the Delta as a whole.

The studies that determined which areas of the Delta had the greatest aptitude for rice cultivation did not take into account the heterogeneity of the soils. The area was not sampled densely enough to give a true picture of the salinity of the various natural depressions. Only under cultivation have many parcels in the polders of Kassak Nord and Kassak Sud established reputations for high but localized salinity. These parcels are almost barren under cultivation. There is no inexpensive way to remedy the problem. Portions of some polders have had to be taken out of cultivation. Proposed extension of polders have had to be held in abeyance or cancelled. The land given to a co-op participant has therefore often been less than his family could work. During the 1976-77 season, only 0.23 hectares was attributed to each economically active adult in Kassak Sud, far from the S.A.E.D. objective of one hectare each. From this 0.23 hectares, each adult was to draw his or her entire economic needs for a year. While the Kassak Sud situation was not typical, Naiga (1976) maintains that in the Delta overall, 0.65 hectares was the average attribution per economically active adult in 1970.

The installation of the villages on such saline soils has virtually foreclosed the pursuit of alternative activities in the surrounding area. Within the polders constructed on the only marginally cultivable land in the Delta, S.A.E.D. ordains the organization of labor, the crop cultivated, the techniques and calendar of cultivation, the marketing price, and schedule. Cultivating a supplementary rainfed millet crop is possible only at some distance from Kassak out of the Delta to the south. The virtual exclusion of cattle from the Delta has eliminated stock-raising as a viable supplementary activity. None of the remaining supplementary activities is of any economic consequence. People fish and do some vegetable gardening mainly for subsistence. Likewise most families have a few chickens. A few men own horse or donkey carts bought on credit from S.A.E.D. The carts provide a small cash income and are used for transportation to any of the major national centers, or to cart men and material around the polders during the cultivation season. Given these limited opportunities to supplement their revenues within the zone, the only alternative for the settlers is migration.

The core of the problem is that the people of the zone of Kassak, as most people in so precarious a position at the periphery of the global economy, are reluctant to put all of their eggs in one basket. Verlet and Hauchecorne (*n.d.*) have

described a similar situation in the Bol polders on the shores of Lake Chad. There, too, the peasants are unwilling to commit themselves to a project participation that would bar them from drylands farming and cattle keeping, their two alternative mainstays. Peasants bridle at the possibility of becoming thoroughly dependent on S.A.E.D. for their welfare. The peasant recognizes that S.A.E.D.'s institutional interests and his personal interests are not congruent, although they may overlap in certain sectors.

The heavy clays of the Delta soils may also limit the benefit settlers can draw from reorganization into producer groups. It is not a foregone conclusion that animal traction is feasible under these conditions. In such case, the group will not be able to reduce its annual endebtment to S.A.E.D., by using cooperatively owned animal drawn farm equipment.

The final natural problem limiting the productivity of the peasant's holdings in the zone of Kassak is pest infestation. The third polder in Kassak Sud was initially withdrawn from cultivation after a variety of wild rice, often called red rice by the local farmers, began to supplant the domestic variety that the peasants were cultivating. The only solution in such a case is to plow the red rice under for two to three years, otherwise leaving the polder fallow. Developments such as this have struck Kassak Nord as well and have been responsible for major reductions in land areas available for cultivation in certain years. Moreover, the size and quality of harvests have dropped when fields were cultivated despite the red rice intrusion.

Animal pests have had more devastating effects. A plague of rats ravaged the rice harvest in 1975-76, just like locusts had the previous year. The sumptuous offering that large concentrations of grain represent, periodically attracts flocks of quelea and other grain eating birds from the bird refuge in Djoudj, a short distance from Kassak in the Delta. Protection of the grain, once it has formed on the stalk, become a much more demanding occupation under irrigated cultivation than under less intensive modes of production.

3) Institutional limitations to the peasant's return in the zone of Kassak: The fundamental question to be considered here is the question of power and the web of dependencies in which the peasant producer became enmeshed as he moved into the Kassak polders. As pointed out above, the peasant-producer has moved from an autonomous economic role into the role of a salaried industrial worker. Or worse, in the zone of Kassak, he has moved into the role of the most

vulnerable of industrial workers, the piece worker. He is paid only according to what he produces, not according to his application of labor. His debt engagement, however, remains a fixed cost whether he produces one grain or several tons. The power to command the producer's labor has shifted from the peasant to S.A.E.D., as the producer has moved into a dependent relationship with the world economic system, a dependence all the more exaggerated by the peripheral position of the Sahel within it.

The first dependency of the peasant-producer is for "complete mastery of water". This poses a question not only of design and execution of the works, but also of financing. The landscape is littered with ambitious irrigation projects poorly designed or unsatisfactorily constructed. Poorly operating works are a major cause for the inadequancies of the Office du Niger schemes (*de Wilde, 1967, vol. 2*). Hochet (1972) points out that with the exception of M'Pourrie, the works in Nauritania have given unsatisfactory and irregular results because of technical short comings. Peasants in the Delta acknowledge that the tertiary works developed in Boundoum Nord on a pilot basis in 1971 were a great success. They insist, however, that the extension of the pilot project throughout the Boundoum Nord polders betrayed the promise the experiment had offered.

The first polder of Kassak Sud was scheduled for conversion to tertiary works by the beginning of the 1976-77 season. Delays in financing meant delays in execution of the work. Shortages of machinery meant hasty execution at several sites in the Delta more or less worked concurrently. The conversion, when completed in Kassak Sud in September, 1976, left much to be desired in the durability of the birms within the polder and in the grading of the polder, the latter a critical operation for the success of tertiary works.

Whether well-executed or not, the works, as pointed out above, are very costly to bring to the culmination of their development. Senegal cannot afford to extract the necessary investment capital from its national budget without severe hardship for government administrators, administrative functions and the general population. Investment capital at the periphery of the world system is a very expensive import. The Senegalese government finances the development of such irrigated perimeters as in the zone of Kassak, by appeal to international institutions such as the World Bank, U.S./A.I.D., F.A.C. and F.E.D., rather than to private investors who generally require even more stringent conditions before they transfer credits. These public institutions, nonetheless, must require the prospective borrower to demonstrate the

profitability of the project in question. Aside from the critique of the economics of this project analysis approach (*see Franco, 1975, for such a critique*), it is clear that the search for capital on the international financial markets requires the borrower to meet the requirements of the lender as the former plans a project.

The project thus elaborated will have to overlook the interests of the peasant producers at several critical points. The price offered the producers will have to be low enough for S.A.E.D. to recover its costs when it sells the produce on the market. There are several ways of recouping these costs. S.A.E.D. prefers to tally up the producer's "debt" for services and material rendered in the course of the cultivation season. That sum is then deducted from the payment rendered the producer in exchange for his harvest. The Senegalese government has also decided to cover some costs by subsidy from the national treasury. In order to balance its books without an intolerably large subsidy, S.A.E.D. must foreclose the possibility of marketing peasant production freely. S.A.E.D. has required the peasant to market all his production not kept for home consumption, at prices set by the government through its facilities.

The central government sets the price of the material and services the producer relies on to cultivate his plot. In this way, the government prescribes the largest part of the cost of production. At the same time, the government determines the price to be paid producers. But prices for material and services have been rising more rapidly than the price paid for produce. Barring a rise in productivity per hectare, a rise granted, predicted with the conversion to tertiary works, the producer runs the danger of seeing his net earning gradually wither away.

The producers depend on S.A.E.D. to evacuate, market and reimburse them for their produce. Before the opening of the cannery in Savoigne, Kassak tomato growers were responsible for trucking their produce to the urban areas to sell on the free market. They vastly prefer that system. S.A.E.D. has appropriated that responsibility since 1972. Tomatoes, which are more perishable than rice, infrequently rot in their crates in the field awaiting S.A.E.D. coordinated pickup. Ba (1976) recorded the most agregious of such cases in Gae during the 1975-76 season. Producer groups may take matters into their own hands and bribe truck drivers to evacuate their produce out of their scheduled sequence. There is no compensation to peasants for losses that follow inopportune pickup.

Yet even if the produce is evacuated before it spoils the producer may witness long delays in payment. The tomato

cannery is notorious for its poor payments record. It took ten months to reimburse S.A.E.D. for its tomato deliveries of the 1974-75 season (*Republic of Senegal, 1976*). Sylla and Diop (1976) indict the Office National de Commercialisation Agricole et Developpement (O.N.C.A.D.), the government produce marketing monopoly through which S.A.E.D. funnels its rice to market, for the same transgression. S.A.E.D., consequently, has trouble meeting its expenses every year. It must delay making payments to the peasants, who depend on them for their welfare, simply because the tomato cannery or O.N.C.A.D. delay reimbursing it for the produce they absorb. Compounding the problem is the delay in central government reimbursement for peasant debts to S.A.E.D. cancelled during the most acute crises of the drought years (*Republic of Senegal, 1976*).

A further peasant dependency on S.A.E.D. is for debt financing. Until 1969, the B.N.D.S. offered producers credit through S.A.E.D. However, the poor reimbursement record following the disastrous 1968-69 harvest led to a refusal of credit the following year. S.A.E.D. has, since that time, extended the credit itself (*Diagne, 1974*). He who extends credit defines the credit-worthy. On that basis, S.A.E.D. is able to sort the cooperative members it deems undesirable out from those it wants to retain cultivation rights in its polder.

Finally, insuring proper use of the irrigation works as they become progressivley more refined, requires a large staff of extension personnel trained to a fairly high standard of technical expertise. Maintaining a competent well-trained staff of extension workers has proven a difficult enough task for S.A.E.D. in the secondary works. Workers are often not at their job cite. They occasionally have violent conflicts with the peasants. The Fulbe of the Kassak Sud Peulh A.I.R. openly discussed the manhandling of one particular extension worker assigned to oversee their work. He did not show them the interpersonal respect they felt themselves entitled to. Like others, he did not have the sensitivity to interpersonal dynamics that comprise the skills essential to adequate fulfillment of his role. Staffing and developing an extension program with the intensity necessary for competent use of the tertiary works, takes a far greater investment in money and personnel than for less intensive technologies of exploitation. More capital intensive programs will demand not only an expanded personnel roster but training to a far more refined technical level than more labor intensive developments. The extension worker will be called upon to oversee the operations of the somewhat delicate hydro-agricultural works, as well as supervise field operations in the high yield varieties which, however sensitive, must be cultivated to make the investment pay off.

Field Interview Survey: Kassak Nord and Kassak Sud

In the course of field research, a structured interview was administered to 67 households in Kassak Nord, 42 households in Kassak Sud and 38 Fulbe households. This represents 45 percent of the households remaining in Kassak Nord, 34 percent of the households remaining in Kassak Sud and 50 percent of the households of members of the Kassak Sud Peulh A.I.R. The interview concentrated on the family's productivity within the S.A.E.D. hydro-agricultural works. The results show that the natural and institutional constraints discussed in the previous two sections have conspired to push the peasant producer's net income in the zone of Kassak in the direction of, if not below, the threshold of his subsistence needs.

Harvest in Paddy Rice - Kassak Nord

Year	1975-76	1974-75	1973-74
Households responding	62	59	44
average yield per household	1597.5 kg.	2901 kg.	586.5 kg.
average surface cultivated per household	3.21 hect.	3.24 hect.	2.57 hect.
yield per hectare	498 kg.	894 kg.	228 kg.
cash value of yield[1]	$86.11/hect.	$154.59/hect.	$39.49/hect.

The yields in the above table were calculated on the basis of data drawn from the memories of the cultivators themselves. The questions were asked at the beginning of the 1976-77 season when the experience of the 1975-76 season was most recent. Yields were given in sacks of paddy rice. In calculation, the average sack was assumed to weigh 77.5 kilograms.

In Kassak Nord, 1973-74 was particularly difficult. It was a drought year, yet ironically, several cultivators claim to have lost their entire crops from over-submersion. The acreage cultivated per household was low, as several lots

1) The official government price for rice is 91.5 francs CFA per kilogram. Franc values have been converted to dollars at the rate of 240F CFA=$1.00.

had been taken out of cultivation due to red rice infestation. A yield as low as the 228 kilograms per hectare claimed for that season is shockingly low. It must be remembered that the producer would still have to deduct the debt he owes S.A.E.D. from the official market value of the crop. In 1973-74, the average debt per hectare easily exceeded the peasant's gross yield. The following year, 1974-75 was an excellent year although pests were responsible for some crop damage. Finally, rats severely damaged the 1975-76 yield and brought it, as the harvest two years before, below the level of the debt the average peasant owed.

Harvest in Paddy Rice - Kassak Sud

Year	1975-76	1974-75	1973-74
Households responding	40	37	32
average yield per household	358.5 kg.	2524 kg.	1597 kg.
average surface cultivated per household	1.58 hect.	2.17 hect.	2.33 hect.
cash value of yield	$39.25/hect.	$201.10/hect.	$118.62/hect.

A major problem for the settlers in Kassak Sud has been the progressive reduction of surfaces available for cultivation. Part of the problem has been the withdrawal of the rodents, in 1975-76, wrought extensive damage on the crops in Kassak Sud, although many householders cited either over-submersion or lack of water for their poor harvest rather than rodent damage.

Harvest in Paddy Rice - Kassak Sud Peulh

Year	1975-76	1974-75	1973-74
Households responding	35	28	24
average yield per household	493.8 kg.	1761.7 kg.	1214.2 kg.
average surface cultivated per household	0.97 hect.	1.52 hect.	2.48 hect.
yield per hectare	511.3 kg.	1160.7 kg.	489.8 kg.
cash value of yield	$88.41/hect.	$200.70/hect.	$84.69/hect.

The Fulbe shared the polders of Kassak Sud until the 1975-76 season, when they were displaced due to the shortage of land in the polders. They were sent to Diawar, about 8 kilometers away. They, therefore, avoided the disastrous year the veterans suffered in the Kassak Sud polders, although they still received little enough rice for their trouble.

The costs of cultivating a hectare of rice are considerable and increase as a polder is converted from secondary to tertiary works. Ba (1976) shows how these costs have been mounting far more rapidly than the price paid for produce. The following table shows the costs incurred cultivating an average hectare of rice in secondary works in 1975-76.

Seed	$ 32.50
Fertilizer	5.00
Mechanical cultivation services	50.00
Tools (amortized over five years)	11.10
Self-investment	20.00
Total cost of cultivating one hectare of rice in secondary works in 1975-76	$ 119.50

The costs of cultivating a hectare of rice in tertiary works is considerably greater than these figures but theoretically, the yields in tertiary works more than keep pace with the increased costs. The self-investment costs alluded to in the above table come from an estimate of the small expenditures that cultivator must make during the cultivation season, for such things as meals and snacks consumed in the field, labor he hires especially at harvest and threshing time, empty sacks he buys to store or market his rice conveniently, drivers he tips to pick up his harvest punctually, transportation he purchases from local carters for himself, his material and his harvests, or shelters he builds as temporary lodging in distant fields. Clearly, among the three cooperatives discussed, only in the 1974-75 season did the average member have harvest large enough to pay back his entire debt. That year, the average Fulbe household had a net income of $123.42 from rice cultivation. The average household in Kassak Sud had a net income of $177.07 from rice cultivation. The average household in Kassak

Nord had a net income of $113.60 from rice cultivation Prorating this income over the estimated 40 days' labor required to produce a rice harvest in Kassak Sud alone, the average daily income exceeded the Senegalese national minimal wage for rural labor, about $4.25 per day. And this is in only one of the three years immediately preceding the author's field research!

The income benefits of tomato cultivation have been equally as dismal for the residents of the zone. In Kassak Nord, 22 of the 67 heads of households interviewed have never exercised their option to cultivate tomatoes off-season. Moreover, not a single householder expressed an intention to cultivate tomatoes during the 1976-77 season. The reasons are clear from the following table.

Kassak Nord - Tomato Production

Year	1975-76	1974-75	1973-74
Respondents	16	30	27
Total participants in tomato cultivation	84	approx. 125	84
Average net income per participant	$15.47	approx. $26.75	$114.09

As tomato cultivation is being done in groups, it has been relatively easy to reconstruct roles and shares to give a fairly complete picture of participation and net incomes. The revenues are the share each participant receives from S.A.E.D. after S.A.E.D. has deducted its debt charges. The 1972-73 season was the first during which tomato cultivation became an organized off-season activity in Kassak Nord.

In Kassak Sud, only 3 of the 42 households polled had never participated in tomato cultivation. Seventeen householders were asked if they intended to cultivate tomatoes in the 1976-77 season. Eight responded in the affirmative. As in Kassak Nord, a presentation of the last three years' yields considerable light on the rising reluctance to continuing tomato cultivation. The peasants of Kassak Sud, along with those in Savoigne, also at that time veterans, were the first to be initiated in tomato cultivation in 1969. While their first several years were quite successful, revenues have dropped well below expectations in more recent years.

Kassak Sud - Tomato Cultivation			
Year	1975-76	1974-75	1973-74
Respondents	33	32	26
Total participants in tomato cultivation	145	Undeterminable	approx. 155
Average net income per participant	$50.39	$119.51[1]	approx. $182.30

The Fulbe began tomato cultivation only in 1974-75. Eleven of the 38 households polled had never cultivated tomatoes and could not foresee participation. Twelve households, all of them Jerbe-Jerbe, contemplated their first season of tomato cultivation during the 1976-77 year. In fact, the season turned out to be a total failure for them, since they were not able to irrigate their plot sufficiently during the early stages of their tomato vines growth. The Jerbe-Jerbe, nonetheless, saw no reason to discontinue tomatoe cultivation.

Kassak Sud Peulh - Tomato Cultivation		
Year	1975-76	1974-75
Respondents	12	15
Average net income per respondent household	$13.89	$37.78

Many of the people who have withdrawn from tomato cultivation cite the extended cultivation season of 5 to 7 months, during which almost daily field labor is required. This is especially true during the last three to four months of the season during which the vines bear fruit, fruit susceptible to rapid spoilage if they escape prompt attention. Tomato cultivation requires something in the order of 100 days labor. On that basis, in not one of the three seasons discussed has the average net revenue per cultivator from the tomato harvest in any of the three cooperatives in the zone, been able to surpass the national minimal daily rate for rural labor. The return from tomato cultivation has generally been only a small fraction of the take home pay for a rural laborer for an equivalent period.

1) This figure is based on the earnings of the thirty-two respondents not on the earnings of the complete boby of participants in tomato cultivation in 1974-75.

Strategies for Change: The Fulbe Case

Obviously the residents of the zone cannot acquire equitable access to resources solely by cultivating in the polders there. The yields are too low and the conditions of production preclude substantial net revenues for the peasant-producer. He must look for alternative activitiés to make up the difference between his income and his requirements.

In contrast with the other residents of the zone, the main subsistence interest of the Fulbe has been and remains herding rather than cultivation. For the Fulbe, the creation of the polders and the installation of the sedentary colonists was a disruption of a way of life. But, to put matters into perspective, the creation of Kassak became a mixed affliction. An important palliative was the newly expanded outlet for milk products. Creation of Kassak Nord and Kassak Sud gave the Fulbe women an opportunity to market their milk closer to home than the more distant customary markets of Ross-Bethio or Rosso Senegal.

A more important consolation for the disruption of local grazing patterns has been the opportunity S.A.E.D. gave the Fulbe to supplement their resources by irrigated cultivation. This form of cultivation has proven far more productive than the haphazard millet cultivation that used to engage the Fulbe every rainy season at the borders of their hamlets.

The drought has, moreover, accelerated the growing interest in irrigated cultivation. The Fulbe, in spite of the experiences of the settlers, are increasingly participating in tomato production. Tomato cultivation may be seen as simply another hedge against the failure of their principal resource, cattle herding, to meet their subsistence needs. It becomes a first choice alternative because the opportunity cost is so low, even though the returns have been discouraging. Migration, the choice of the settlers, would take the Fulbe out of the zone and out of touch with the welfare of the herds, an alternative far more risky than tomato cultivation. In the last decade, the Fulbe have seen their primary resources severely undercut as the mainstay of their welfare. Their interest in cultivation in general is no longer merely to retain access to their historical pasturelands. The drought has apparently coverted many of them, in a much deeper sense, to mixed farming. They are very anxious, for example, that S.A.E.D. proceed rapidly to prepare a polder for their exclusive use. Sharing the polders of Kassak Sud has brought its inevitable conflicts. The veterans feel they have little enough land for their own use, let alone to share with outsiders.

The Fulbe have begun to establish their hamlets in the Middle Delta for year-round habitation. Some are even talking of experimenting with mud brick or cement block dwellings. Cattle are permitted in the area only during the rains, when there is plenty of sweet grass and fresh water in the Delta outside the polders. Of course, the surveillance requirements of the rainy season --the beginning of the cultivation season-- are particularly demanding. During the dry season, in a diametric reversal of the pre-S.A.E.D. pattern, the young men take the cattle south.

Strategies for Change: Divison of Labor

Only family heads farm and younger children sometimes help. Young men attend to the cattle during this cultivaiton period. Fulbe women are virtual onoparticipants in cultivation. Their day is spent milking the herds, supervising household activities and transforming and marketing milk and milk products.

It can be said that the Fulbe of the zone of Kassak are turning into peasants, since they are adapting their subsistence strategy to permit participation in irrigated agriculture during two crop seasons a year. Cattle keeping remains for the time being unassailably their primary interest. It must remain so, given the to-date problematical dependability of the polders to replace cattle as the mainstay of their support. They have been observing the predicament of the settlers closely for over a decade. Where the polders are able to provide the underpinning for a dependable sedentary cultivation economy buttressed by herding, the Fulbe would perhaps continue the "peasantization" process to the point of their counterparts in the Upper Cassamance who, having begun the process some 200 years ago under more suspicious circumstances, still adhere strongly to cattle keeping as an important secondary activity, but focus their productive efforts on cultivation. But that is a separate story.

The S.A.E.D. polders expanded the range of alternatives at the disposal of the Fulbe to meet their material needs. However, they constricted the options for the peasants who settled in Kassak Nord and Kassak Sud. This constriction has been a function of the Delta environment, which does not permit such alternatives as vegetable gardening or dryland farming to any significant degree. In a situation of low yields and substantial underemployment, the introduction of off-season tomato cultivation seemed,for a time, to offer just the supplementary activity sought. But the opportunity cost of tomato cultivation has

proven too steep for the settler villagers. While they thronged to tomato cultivation, especially in the critical drought years of the early 1970's, they have begun to withdraw from it in recent years, giving increasing favor to another alternative, itinerance.

In the context of Kassak, itinerance means the seasonal movements, linked to the agricultural calendar of settlers between the polders of the zone and other sites which offer opportunities to make up the resource deficit left by work in the polders. While itinerance is a commonly used strategy in both Kassak Nord and Kassak Sud, the sociological distinctions in the composition of the two villages have led to distinctive patterns of itinerance in each one.

In Kassak Nord, there are two general patterns of itinerance. In the first, the householder leaves his family in the village while he travels. Often the householder becomes a small-scale traveling merchant in the rural areas along the river, bicycling from village to village selling cloth, used clothing, hardware, kitchen equipment, radios or patent medicines and cosmetics. Other than irregular visits when his affairs take him into the neighborhood, he stays with his family only during the rice cultivation season when he is active in the polders. Several householders specifically indicated that they had withdrawn from tomato cultivation to allow themselves more time to pursue itinerant commerce. Similarly, several of the casted fishermen of the village participate in the expeditions that follow fish migrations between Nouadhibou and the coast of Sierra Leone during the dry season. They also return for the rice cultivation season. The attachment to rice cultivation is less a result of more bountiful harvest than of the nature of the crop itself. Rice is a cereal staple that can be stored at home almost indefinitely. Tomatoes are a highly perishable condiment that can be turned to practical service only through the mediation of S.A.E.D. It is difficult to estimate the number of Kassak Nord residents pursuing this first itinerance pattern.

In the second pattern, the householder removes his family from the village and relocates it most often in the area from which it originates up river. The householder tries to retain his cultivation rights in the polders. Every year he returns to Kassak Nord to sow the rice. He may stay long enough to do a first weeding. He then leaves only to come back for harvesting. He stays in the village house assigned to his family and eats with friends or subscribes to a bowl prepared by one of the village women for about $10.00 a month. Friends watch over his plot in his absence.

They send him a message if his presence is required. His harvest, for lack of proper care, may be smaller than average but he will have acquired a handsome resource supplement for a minimal investment.

The field survey conducted in Kassak Nord elicited the names of 77 householders who had removed their families from the village since their arrival in 1966. The peak years of removal were 1968 and 1969, immediately following the first of the disastrous harvests, and between 1972 and 1975, the most difficult years of the drought. All but 23 of the departing families returned to their home areas up river. The 23 exceptions went to the urban areas. Many found regular employment there. Six went to Kakar, four to Saint-Louis, four to Richard-Toll and three to Nouakchott. Many of these 77 householders who had removed their families from Kassak Nord retained their cultivation rights in the polders, although it has proven impossible to determine how many activate those rights from year to year.

In Kassak Sud, very few householders leave their families in the village while they go on extended travels. The education, experience and familiarity with French that the veterans accumulated in the course of their military service has facilitated their recruitment as S.A.E.D. extension workers, drivers, pump mechanics and laborers. It has been possible for residents of Kassak Sud to find cash employment closer to home more easily than for residents of Kassak Nord. It has been easier for residents of Kassak Sud, given their background, to find urban employment and integrate themselves in Senegalese urban society. This fact has reduced the number of householders in Kassak Sud choosing to quit the village seasonally, leaving their families behind.

On the other hand, it is quite common for a householder in Kassak Sud to have relocated his family to one or another of the major towns in Senegal. He comes to Kassak Sud only for the first and last field operations of the rice cultivation season. During the tomato season, he either forgoes tomato cultivation altogether or hires someone to take his place in his producer group. In effect, he rents out his access rights acquired as a member of the cooperative to a nonmember, usually a local Fulbe adolescent or an itinerant Moor or Tukulor agricultural laborer. The householder demands one-third of the crop if the laborer provides his own subsistence during the season, one-half if he does.

The field survey conducted in Kassak Sud elicited the names of 61 householders who have removed their families

since 1968 and 1969 and from 1972 and 1975. Only nine of these families went to the rural areas. Twenty-four went to Dakar, seventeen to Thies, four to St.-Louis and three to Richard-Toll. Many have found employment in these areas while they continue to exercise their cultivation rights in the polders, either in person or through delegates hired or chosen through family ties.

In Kassak Nord and Kassak Sud, the wives pressure their husbands to move the household to exploit their rights in the polders by seasonal return of the husband alone. In one way the wives are anxious to return to the more familiar social milieu from which their family issues. In the zone virtually all social relations are with strangers. Life in the zone has been unproductive and unsatisfying for the wives. By its nature, the zone does not permit economic activity outside the polders. Since men only are normally admitted to membership in the cooperative, the fruit of a wife's field labors reverts to her husband's account. She no longer has any independent access to resources. This represents a net loss to her, compared with the general situation in rural Senegal where anyone may cultivate a plot whose production is completely at his or her disposal, provided they fulfill their responsibilities in the common family plot. In this sense, moving into the S.A.E.D. perimeter has undermined her sense of security and threatens her welfare. In 1975-76, for the first time, a producer group whose membership was entirely female, was admitted to tomato cultivation in Kassak Sud. In spite of what turned out to be low net returns and some controversy over allocation of the returns by the officers of the group, the membership tripled for the 1976-77 season. As with the Fulbe, the women find the opportunity cost of cultivating tomatoes so low, even with low returns, that it becomes an attractive alternative. There is none other available without a prohibitively high sacrifice.

The difference between Kassak Nord and Kassak Sud in their approaches to itinerance, lies in the rural nature of the former and the urban integration of the latter. For the itinerant peasant of Kassak Nord, the polders have become simply his more distant fields. For those of Kassak Sud, the polders have taken the place that cultivation rights in their ancestral villages, rights long since abandoned by veterans whose military service has taken them to Europe, North Africa and South-East Asia, retain in the subsistence strategies of many Senegalese urban dwellers. Many urban dwellers, throughout the country, even those with comfortable middle class income according to standard of the world

economy, spend part of the cultivation season in the fields every year. The harvest brings some relief to their invariably tight budgets.

The villagers who settled in Kassak can be said to be turning into "nomads", insofar as they resort to several forms of itinerance to supply the difference between their annual material requirements and their ability to meet their requirements in the zone. It is somewhat ironic that one rationale for the creation of the irrigated perimeters in the Delta was the hope of decreasing the migration rate in the river valley by offering a secure, dependable, generous source of income in the area. The project, having betrayed its economic promise, has, in fact, become a prop supporting itinerance as a viable subsistence strategy for the peasant producers. It has served, in this way, to make migration all the more the norm in the Senegal River Valley.

IV ANALYTICAL CONCLUSIONS

The "new adaptive mechanisms" that have emerged from the stresses of the recent drought seem hardly to be departures from pre-drought behavior. What is new is the rapidly increasing reliance on mechanisms that had hitherto been less frequent occurences.

Among the sedentary cultivators of the Delta area, migration soared during the drought. Historically, migration has been an outlet relieving stress in the Senegal River Valley-- not to mention elsewhere in the world-- for centuries. Productivity in Kassak has been consistently low. There have been constant departures. The departures peaked during years of peak stress in the late 60's and then again in the early 70's. Throughout the Senegal River Valley, the drought years accelerated the rate of out-migration. The drought seems to have been responsible for the formation of a large permanent rural labor force moving about the river valley in search of temporary agricultural work. This mobile work force is often a substitute for local absentees, who have become part of the urban work force as have many of the residents of Kassak Sud.

At the same time, vegetable gardening is gaining greater and greater interest among the sedentary farmers as a source of cash income. This is especially true in the quasi-urban centers where there are high concentrations of people, such as government functionaries, with dependable cash income and a taste for such dietary supplements. Cabbage, tomatoes, carrots and onions are the most widely cultivated, but lettuce, green peppers, green beans and

cauliflower are also grown. Vegetable gardening is especially popular during the dry season, grown after the rainy season grain staples have been harvested.

Despite the discouraging experience in Kassak, interest is also growing in village perimeters, small irrigated perimeters, of 50 to 75 hectares at a maximum, developed on their own initiative by the villagers themselves with relatively little input from the outside. Several of these have sprung up on the Mauritanian bank of the river.

The cattle herding population has been more profoundly affected by the drought than the cultivating population. The herders are seriously looking for a supplementary economic activity. They recognize that herding is not dependable as the sole means of meeting their needs. They see that irrigated agriculture offers an excellent subsistence -- and even cash -- supplement, as long as the requirements of irrigated agriculture remain flexible enought to permit them to pursue their primary interest of cattle herding.

The urban drifters, as ever, are looking for wage labor in the urban context. But they have not cut themselves off from the rural areas by any means. They try to retain rights to the agricultural land in the rural areas to grow food for their family's subsistence and, if possible, to acquire some cash income. They, too, are interested in main season irrigated agriculture, as well as vegetable gardening as an off-season activity.

V RECOMMENDATIONS

There are several types of concrete projects that merit further investigation. Off-season vegetable gardening deserves serious attention by donor agencies. Many of the sedentary cultivators and the refugees in urban areas have already turned to this activity as a source of revenue. The very option of vegetable gardening necessitates participation in the cash economy and therefore, lends itself quite well to the intervention of outside institutions that must justify their activities on a rationale of cost-benefit analysis. The gardening operations need marketing advice. They could use extension services knowledgeable in the areas of variety selection and cultivation techniques. Provision of these services, however, must be low in cost to the producer and they must not constrain the producer's economic autonomy ability to act as a free agent in the market. Otherwise, the risk of aborting a very promising departure is very great.

The herders have shown no interest in off-season vegetable gardening. They seem, however, to be interested in marketing cattle products, especially milk. In the late 1960's and early 1970's, the UCOLAIT scheme, based in St.-Louis, was organized for the purpose of collecting, treating and marketing milk from the Fulbe herds in the Delta area (*Diagne, 1974*). It failed for several different reasons. The present time may be a more propitious moment to begin a new project with similar objectives. SWISSAID has underwritten an apparently successful effort to collect, process and market milk products made from local milk in the area of N'Djamena, Chad. (*Pfister and Rauch, 1977*).

All three groups, however, are interested in irrigated agriculture. Donors could be of great assistance in this area. The question becomes one of the type of irrigation project that donors ought to underwrite. It has become clear that large projects underwritten by intensive capital investment are not tailored to the needs of the people concerned. The financial requirements of the projects, when translated into organizational requirements at the level of the participants, are often too constraining to permit the participants a return they find satisfactory. The situation described in the zone of Kassak under Section III of this paper exemplifies this problem.

More appropriate than large-scale capital intensive hydro-agricultural development, may be small scale village perimeters developed mainly on the investment of local labor with some supervision from representatives of competent outside institutions. Such development would protect local autonomy to a far greater degree than capital intensive development could. Small perimeter development has already begun in the Matam and Bakel areas of the Senegal River Valley, the latter financed by U.S.A.I.D.

On the Mauritanian bank of the Senegal River, there are several communities -- among them a group of Fulbe herders near Dagana, twice visited by the American investigator -- that are trying to develop independent village perimeters on their own initiative. Adams (1977) records at least one such village on the Senegalese bank. There are most probably more on both banks of the river. It would seem appropriate for a donor agency to cultivate ties with national extension services with an eye toward timely information on such villages. Intervention on a modest scale -- technical advice and a diesel pump -- at the formative stages would be critical to the success of village perimeters.

This brings up a final, more general recommendation. From its experience, the team feels that more modest, less capital intensive development projects that concentrate more on what might be termed "human development", hold more promise for success than the current generation of grand projects the team has been seeing in the Senegal River Valley.

VI SUMMARY

When confronted by the drought, the people of the Senegal Delta were quick to broaden their resource base. Cultivation in the rural areas and urban job hunting became two poles of the itinerance strategy of the sedentary peoples. The pastoralists tried to remain in the rural areas preserving their herding interests by moving into irrigated cultivation near their settlement sites.

Even after several years of relief from the drought's harshness, each group continues the strategy it found most adaptive during the drought. All three groups are looking for opportunities for cash income. They have expressed concrete interest, by their very actions, in such things as off-season vegetable gardening in the case of the urban squatters and the sedentary cultivators in commercializing cattle products in the case of the herders. All groups are interested in irrigated agriculture, if the structure of production can be made congenial to their interests.

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CHAPTER FIVE

FIELD PROFILE: UPPER VOLTA

Geography And Climate

Upper Volta covers an area of 105,900 square miles. It is a vast wedge-shaped plateau varying in altitude from 650 to 1,000 feet, and primarily consists of crystalline rocks interspersed with igneous intrusions.

The topography ranges from wooded hills and park-like savannas where cattle graze, to the fertility of lowland rice paddies.

The main rivers - the Leraba, Comoe, Black, White, Red Volta, and the Oti flow toward the Gulf of Guinea. In the eastern part of the country, the Garoual, Sirba, and Tapoa rivers drain into the Niger River.

There are two marked seasons in the country - the rainy and the dry season. The dry season is characterized by cool and dry weather from November to March, and hot and dry weather between March and May. The rainy season moves from south to north beginning in May and lasting until September.

Field research was conducted in the Kouri region of Upper Volta, which is located in the Eastern Ord, sous-prefecture of Bogande. It is about ten kilometers south of Piela on the Fada N'Gourma-Bogande road.

Although Kouri is located in a fairly isolated region of the Eastern Ord, its location on the Fada road, extensively used during the dry season, and its proximity to the Puytenga market permits easy access to outsiders.

Relief

Kouri is located on a plateau between two natural basins. The village itself is on fairly high ground which slopes into natural basins that extend from the northeast to the northwest of the villages. There are two seasonal ponds, northeast and northwest. The village is bordered at the north by several small hills approximately 340 meters high.

Soil

The soil in most of Kouri is richer than elsewhere in the area. Fairly hydromorphic, it is composed of earth derived from the decomposition of granite found on the hills surrounding it. Consequently, the soil is much less sandy and richer in argile than in the other areas, and is classified as sol a' mull (*B. Kaloga*). The relative fertility of the area attracts temporary and permanent migrants, especially in times of drought when poorer soils are completely unproductive.

Hydrography

Exploited water resources: The Barrage is constructed on one of the large marigots located at the eastern boundary of the village. It was constructed by Hydraulique Equipment Rural (HER), circa 1964. It is also used as a bathing pool by all the villagers. Although the water level lowers considerably during the dry season, it contains water all year.

Wells

To date, HER has built four wells in the village of Kouri. The oldest well is in the southwestern sector of the village. It is thirty meters in depth. The well is virtually useless and dries up completely in February. Two wells of 20 and 17 meters in depth were constructed in the northeastern sector of the village. One well was constructed in 1975, the other in 1978 by HER. One is located in the Fulani sector of the village. There are also six indigenous wells located in various sectors of the village, varying from 5 to 17 meters, that are close to bas-fonds or to the barrage. HER constructed wells are fortified with cement, while indigenous wells have to be re-dug yearly. All the wells dry up by the beginning of May. Then the villagers use the barrage's water supply.

Marigots (Seasonal ponds).

Large seasonal ponds are formed during the rainy season. Not only are they a source of water during the farming season, but they also provide the villagers with fish at these times. During the farming season, these alternative sources of water are used by the peasants whose fields may be located far away from the wells. The danger of drinking water from these sources is well known

to the peasants who are constantly plagued by Guinea worms. Marigots contain water from July to November.

Rivers

The Sirba is located about five kilometers from Kouri. It stops flowing completely by late October. However, during the rainy season, it is a fast flowing river that can only be crossed by boat and has claimed the lives of many unwary bathers. The bridge built in colonial times has fallen into disrepair, thus completely cutting off access to the area during the rainy season.

Rainfalls

Average rainfall is between 600 and 800 mm per year (*Senechal 1973*). However, as many observers have stressed, the distribution of rain rather than the total amount of rain is the decisive factor. Last year's season is an example of the effects of poor distribution of copious rains. The area's total rainfall was at least 200 mm above average. However, the mid-season drought virtually destroyed the corn crop, and the heavy rains at the end of the season detached the flowers from the millet stalks, making it impossible for it to germinate and produce seed. Last year's harvest suffered severe losses of corn and millet.

Vegetation: Sudanic Vegetations

Drier regions are populated by Baobabs, Acacias, Balanites d'Egypte, while the bas-fonds contain most of the fruit trees: tamariniers, raisiniers, marites, neres, figuiers, and cailcedrats. These trees are used in daily diet, in religious ceremonies and for medicine. (*Senechal, Kaloga*).

Climate

Rainy season begins in May and ends in late September, early October. The dry season lasts from October to May. December to February is known as the cold season. The night temperature drops to about 59 or 60 degrees F. The daytime temperature stays around 90 degrees F. A harmattan wind blows constantly. March, April and May are known as the hot season, with temperatures that range from 102 to 114 degrees F.

History and Ethnographic Configuration

History of the region reveals that, until recently, this area has remained isolated while retaining much of the traditional structures. Despite the fact that integration into the modern economy began with colonial times and was developed further with the introduction of the cash crop, the area remained isolated. Indices of isolation included the lack of consumption of manufactured goods (*Senechal, 1972*), the relatively low level of scholarization of the peasant, even in relation to other areas of the country; the small numbers of government personnel; the lack of perenially navigable roads; the lack of schools and hospitals; and the low level of migration to or from the area, are among the many factors.

Origins

The ruling family of Kouri is said to have come to the area from the region of Kantchari which is close to Niger. Senechal states that the original populants of the area were the Mossi Nionose. The Gourmantche settled in the region during the 17th century.

Origins of the Gourma

The political origins of the Gourma are closely related to the Mossi's. Diaba Lompo, the legendary originator of the kingdom is said to be the son of Ouedraogo, the founder of the Mossi kingdom.

Gourma political structure closely resembles the Mossi, with a few exceptions. The village chiefdom, Dodieba, is at the base of the traditional political structure. Several village chiefdoms comprise a Kuamba. The chief of the canton has the title of Jisindjanu. He pays tribute to the paramount chief Yadja, who resides in the capital city of FadaN'Gourma. The main difference between the Mossi political hierarchy and the Gourmantche's is the relationship between the Jisindjianu and the Yadja. The Djisindjianu is almost totally independent politically.

The chiefdoms of northern Gourma, where Kouri is located, were established about five centuries later than the chiefdoms in the south. Internal political strife gave rise to mass migration to the north in the 17th century.

The Colonial Period

The Gourma colonial experience differs somewhat from the Mossi ordeal. Many villages of the Mossi plateau had drastic alterations of their agro-economic cycle because of forced labor. Both men and women were subjected to forced labor. In addition to severe taxation, this prompted many to migrate. Some migrated seasonally in order to meet the demands for cash, others migrated permanently in order to escape the repressive colonial government.

Even though the population of northern Gourma was also subjected to the perils of the French administration, lack of natural resources as well as low population density kept the colonial powers from developing an active interest in the area.

One of the first steps in the economic transition of the society was precipitated by the imposition of taxes, and by the refusal of the colonial administration to accept cowrie shells in payment. Meeting tax obligations compelled the population to create additional surplus. Originally, taxes were paid through the sale of grain. Around 1974, peanuts as a cash crop were introduced. They were introduced to the area by the traditional chief of Canton who had been officially incorporated into the French colonial structure. He was in charge of collecting taxes for the administration. Tax payments were a great burden on the population and the chief felt that the sale of peanuts would provide the revenue needed for tax payments.

When peanuts were introduced as a cash crop, women became the major producers. Men were not as interested in cultivating them, because they already had control of the more socially valued millet and cotton crops. In addition, they could easily gain access to the women's revenue from the sale of their peanuts by selling them cotton.

Women bought raw cotton in order to make thread that would be woven into bands of cloth. Cotton bands were one of the principal means by which women could accumulate wealth. It is said that in the old days, women were richer than men because they were the only ones who spun thread and thereby had almost exclusive access to cloth. The cloth could be exchanged for cattle, salt, and was also used in the payment of bride wealth. Mothers were important contributors to bride wealth.

Peanut production has increased fourfold in the last ten years. This is due in part, to the rise in the numbers of men growing individual plots of peanuts. Villagers have stated that men are cultivating peanuts because of the growing use of manufactured cloth and the decline in weaving. The demand for cotton on a local level decreased sharply in the last seven years, which meant that the men's access to money through the women was limited. In an effort to offset their losses, men turned to peanut production.

Social relations and reciprocal forms of labor gave access to locally produced goods without cash payments. For example, male relatives would supply women with cotton. Once spun, the thread was woven by relatives who were allowed to keep a small percentage of the cloth in exchange for the labor. Other goods and services were provided for in this manner.

Money from the sale of cash crops was spent primarily on tax payments. Nevertheless, as the economy gradually became more monetarized, the profits from the sale of peanuts were used for a wider range of purchases. Because of the rapid integration of other sectors of Upper Volta into the money economy, almost all imported goods such as cola nuts, salt iron (*mining had declined*), had to be paid for in cash. Despite revenue from the sale of peanuts, the Gourma's access to cash was very limited. Thus their consumption of manufactured and imported goods remained minimal.

This sparsely populated region has a population density of 10 inhabitants per kilometer square. The neighboring Mossi region has a population density of about 40 inhabitants per kilometer square. Large expanses of Gourma territory still remain unpopulated and most of the villages have less than 200 inhabitants. In the past these unpopulated regions were attractive to the Fulani herders seeking uncrowded grazing areas. Many nomads have settled in the area. There are also pockets of Mossi settlements in the more densely populated regions of the east. Their numbers have grown in the years following the drought.

The relative infertility of the soil, aggravated by a lack of a perennial source of water is the reason for the constant migration of individual families. This has always been the case. Nonetheless, in precolonial times, their radius of mobility was limited because of the threat of slave hunters and wars. During colonial times, tax evasion provided a powerful incentive to move

from village to village in order to avoid the census takers. However, fear of being captured for forced labor tended to restrict population movement.

Despite the relatively high mobility of individual families, the village settlements are permanent. The inhabitants are organized on the basis of membership in a patrilineal descent group which gives exclusive title to land and religious and political offices. Each village is ruled by the oldest residing lineage segment.

The village of Kouri is located in the Sudanese climatic zone. Although it is not in the Sahel region proper, the village seemed to be a suitable area in which to study drought related social change for the following reasons:

1) The villagers had felt the effects of the drought prior to 1973. The elders of the village reported that the rainy season has been progressively shorter since 1964 and consequently many varieties of food have ceased to be cultivated in the area.

2) The village is populated by a mixed group of peasant farmers and pastoralists, thus allowing the possibility of making a comparative study of the effects of drought on societies exploiting the eco-system in two distinct ways.

3) The region housed recent migrants, pastoralists and farmers, seeking refuge from drought afflicted regions.

4) There are few instances of migration among the youth of the area. This meant that unlike other places, the populace had not resorted to mass migration, seasonal or otherwise, as a way of coping with the crisis. Adaptive strategies were being developed within the confines of the geographical region.

5) The population seemed receptive to a study of this nature.

The Gourmantche are sedentary farmers cultivating cereal and raising a small number of livestock. The agriculture of the area is characterized by hoe technology and shifting cultivation. The basic unit of production was the extended family. Families worked collective plots of land growing millet and sorghum. In addition,

various family members would cultivate individual plots of common farm products. Before the introduction of peanuts as a cash crop, women grew individual plots of millet while men grew cotton and tobacco. There were a number of other vegetables and grains grown in small quantities.

The bulk of food consumption was met by cultivation on the part of household units. These households were usually composed of three generations of male agnates, their spouses and children.

Within the patrilineage, families that did not pool their labor, or economic resources, could be depended upon as a source of help in times of hardship. The threat of drought has been constant for decades. Even in years of adequate rainfall, a region or a village will suffer a localized drought. Because of this, mutual aid groups outside of the village community have been extremely important. Marriage ties are an important element of social relations between villages. A married woman would go to her natal village, help with the harvest and bring back a substantial amount of millet for her family. If her husband's family land was exhausted, they could move to her natal village and work on land provided by her patrilineage. Despite these forms of mutual aid, a family is usually thrown back on its own resources most of the time.

Division of labor was based on age and sex. Farming was shared by all members of the household. Women were in charge of all food processing activities, including searching for water and carrying wood. Old men and old women were exempted from communal farming. Old women, however, tended to cultivate individual fields of millet and pois de terre. Small livestock were taken care of by children while cows were entrusted to the Fulani. Men engaged in warfare.

The rainy season from May to November was devoted almost entirely to agricultural activities. The dry season was devoted to practicing such trades as pottery, weaving, leatherworking, basket and mat weaving, marketing and blacksmithing.

Markets, then as now, were held once every three days. Women traded raw and processed foods while men traded salt, animals, magic substances, etc. The long distance trade was engaged in primarily be a particular lineage. They travelled as far as Mali for salt in exchange for village produced goods.

Even though the villagers depended on long distance trade for a few commodities such as salt, and in times of famine were known to travel as far as Niger in search of grain, they were virtually self-sufficient. All the goods necessary for their subsistence were provided in the village.

Social and Economic Analysis

The drought occured at the beginning of the 70's, at the end of a cycle of prosperity in the highly industrialized countries of the west. There was money available for "aid" to countries like Upper Volta which, unlike Zaire, were not at the top of the priority list of African countries destined to receive foreign aid.

Voltaic economy was stagnating if not regressing during the decade of the 60's (*Amin*). The sharp change in consumption patterns occuring in the 70's is in part related to international response to the drought. Response to the drought had a decisive role in shaping the present economic panorama.

Countries that had never before contributed foreign aid to Upper Volta were now donating large sums to be utilized in development and drought relief programs. All over the country the volume of trade increased. The transportation industry flourished. It grew, in part, out of money donated for the purchase of trucks utilized in the transport of grain to severely afflicted regions. New roads were built and old ones paved, opening up previously inaccessible areas. These areas were not only beneficiaries of drought relief efforts, they also became new sources of surplus grain for speculators supplying grain to urban centers. Grain speculators widened their market thus permitting them to keep their purchase price low. As the peasants need for cash increased, so did his efforts to produce surplus grain. Even scarcity of grain did not substantially augment the price of grain paid to the peasant by grain speculators.

Urban areas were the first affected by the increase of cash in circulation. More isolated regions were quickly affected for two reasons: 1) the surplus cash in circulation was great enough that some of the excess reached these regions before long; 2) the primary objectives of the drought relief was to relieve the areas most strongly affected by famine, i.e. the rural areas. In carrying out this objective, drought relief programs became a major force in the full scale integration of

the population into the national economy.

Drought and the Expansion of Economic Alternatives

The pressures of the drought and the state of the Voltaic economy at the time, encouraged the villagers to choose from a number of economic alternatives. Famine emphasized the importance of paid labor, business investments, and the use of more advanced farming techniques. Careful analysis of the family structure and of the roles of each member of the family (*the unit of production*), is required in order to elucidate the manner in which individuals accommodated to and accepted these changes.

Economic Alternatives of Men

Traditionally, the economic goal of a man is to head a unit of production comprised of his polygamous household and those of his sons. This gives him titular control of goods produced and optimum access to surplus labor. The aforementioned heads of households are few in actuality. Young men are usually motivated to seek a means of economic independence as a short cut to attaining traditional goals. However, the economic opportunities available to young men before the drought were severely limited. This area is one of the least favored economically. Sale of cash crops was the principal means of acquiring money. Some young men supplemented their meager earnings from the sale of peanuts by selling luxury items such as kola nuts in small quantities. Even today, in a period of increased consumption, the most a young man can hope to make on a given market day from the sale of these items is perhaps 100 CFA francs (*250 CFA francs = $1.00*).

Opportunities for participation in the economic community outside of the village were equally limited. Among the Mossi, a majority of young men migrate to the Ivory Coast as seasonal laborers. This is not the case with the Gourma. Because of their lack of social contacts in the Ivory Coast, few Gourma youth work there (*this is changing however*). Some young men migrate to Niger for short periods. But in general, migrant workers are few.

Population density has always been low and income level is among the lowest in Upper Volta. Marketing of non-agricultural goods, another possible economic alternative, has not been viable until quite recently.

In the wake of drought relief programs, villagers found that economic opportunities were broadening in the

very areas in which they were residing. Response to the drought on a national and international level brought an influx of strangers to this relatively isolated area. The strangers consisted primarily of the following: experts supervising relief projects in the area; nomads from the societies of the north migrating to less afflicted regions; and businessmen seeking to purchase grain. Drought relief projects had the greatest impact since they provided temporary jobs. Nomads trading cattle for precious grain increased the cattle holding of the peasants (*there is an inverse relationship between scarcity of grain and the exchange value of cattle*).

With the increase in population came an inflow of cash to the area. Businessmen and expatriate project directors contributed to the inflow of manufactured goods to the area. There was also a greater demand for manufactured goods in the villages where cash became increasingly accessible. Concurrently, the manufacture of goods within the village began to decline.

Although remaining peasant farmers, many young men started businesses as shopkeepers. New roads gave them easier access to markets where manufactured goods could be bought. More important, the roads allowed businessmen to bring manufactured goods to the villages with greater regularity. The increase in demand brought on by the increase in population with access to money made selling profitable.

Other men chose to open "restaurants" to feed the growing number of strangers that presented themselves at the market, while older men sought to increase their cereal production.

These new economic alternatives emphasized the role of the peasant as wage earner and as profit maker. The economic transactions focused the villager's attention to elements originating outside of their communities. Urban centers were seen as sources of goods and cash. Intra-village social relations providing access to resources and goods produced within the village, were gradually undermined.

Taking advantage of the recent economic opportunities involved several changes in the social relations of production known to the villagers. The new economic setting required a certain amount of individualization. Heads of units of production, or compounds, expected their sons to work with them in the collective fields. The expectation was underlined as the pressure

to increase production became greater. Young men, perceiving the advantages of converting surplus to all purpose cash, were now interested in exploring economic routes that gave them direct control of the fruits of their labor. (*The advantages of converting surplus grain to cash have been increasing since colonial times*).

Working as paid laborers, in many cases, took them away from farming at the most important periods in the agricultural cycle. As shopkeepers, they are required to spend long hours in the stores, days travelling to and from central markets, and to participate actively in all the local markets. Business ventures also require an initial outlay of cash which usually meant that young men would devote more time to the cultivation of their private fields in order to amass the necessary cash to launch themselves in business.

The role of women in this economic climate took on added importance. It will be shown that in these instances women furthered the economic expansion of men on two levels: 1) by filling the work gaps created by men once they became actively engaged in other activities and; 2) by providing men with the material means with which to start businesses.

To explain the above, let us quickly examine women's traditional economic goals. The economic goals of women have traditionally been the economic prosperity of her father and hence of his lineage. By the time a woman becomes economically important, she is married and already residing outside of her own lineage. Once married, she has to act as an economically independent being.

Although she takes part in collective farming, her economic goals are private, i.e. centered on herself and her children. Her highest economic position is attained when she is old and no longer has to take part in communal farming but can appropriate all the fruits of her labor to herself and to her children. Her economic activity is separate from that of her husband. This is illustrated in the inheritance laws. If a woman dies leaving no sons, all her property returns to her father's lineage. Her older brother is in charge of dispensing her property among her kin.

A woman is expected to be self-reliant economically. Her position as wife contrasts with her husband's position as a member of his lineage. She is the stranger, he is the relative. She is concerned with the immediate

family, i.e. the patrilineage. Economically, he functions as a member of a lineage. His highest economic status is achieved when he becomes the oldest head of the compound and has control over the fruits of labor of the unit of production which he heads. He stands to gain from the traditional structure and the woman stands to gain from individual enterprise. Women's traditional values placed them in the position of being the most progressive element in the economic transition of the village. However, in so doing they laid the basis for their increasing economic dependence on men.

The economic structure required a breaking away from the family. Men had to act outside of the traditional cooperative structure. Mothers have traditionally benefited from the economic independence of their sons. A mother has easier access to her son's goods than to her husband's. In many cases mothers have encouraged their sons to cultivate separate fields from their father's. This sometimes implies setting up different households. This is one reason why women are such important contributors to their son's marriages. A married and economically independent son is a great asset to his mother. In all cases a woman stands to gain from the economic successes of her son. The new economic atmosphere provided added opportunities for economic independence.

Certain conditions created by the drought gave older women added opportunity to aid their sons in their efforts to be economically independent. I will show how the scarcity of grain became an important element of this process.

One of the immediate effects of the drought was to place great strain on the grain reserves controlled by the head of the household. The head of the household is under obligation to feed his family before he can sell the remaining surplus. Women, who also grew grain in individual plots, had a little more surplus than men. Women, particularly older women, grow millet for their marketing activities. Since they are not obliged to feed their families with their private stock (*their private stock is used only as the last resort, if their children are grown*), they were able to take advantage of the great demand for grain from the transient pastoral groups. Their sphere of exchange is primarily in the traditional market and so they bartered rather than sold much of the grain that was marketed. As a result they were able to build up their livestock holdings by trading millet in exchange for animals. I must stress that there were years in which there was no surplus to be found anywhere in the village. Building up of livestock holdings occured on a very small scale. No woman has more than four cows in the village,

and many said that they got most of their animals in the early 70's when they were much cheaper. I must also stress that this was the case for older women whose grown children are full time producers and not dependent on her for food. Older women have a little more time, and a little more access to surplus labor. Younger women, being strangers to the village, have limited access to surplus labor, and also share the burden of feeding their children.

The money that came from the eventual sale of these animals was quickly reinvested in the business activities of the women's sons. Many women sold their cattle in order to assist their sons in the purchase of bicycles or mobylettes with which they could engage in long distance trade. Other women financed their son's business ventures. As sons are the only economic security of an older woman, it is not surprising that she invests her material resources in this manner.

Allocation of Time

Boserup states than an increase in the population density in rural areas calls for a change of agricultural system towards higher intensity. This affects the balance of work between the sexes and calls for a readjustment in the allocation of time.

The population density in the area is still quite low but the pressure to increase production of surplus, in addition to the low level of farming technology have resulted in the intensification of farm labor. Farmers need more land to meet their needs. The motivation to have direct control over the sale of surplus produced, has prompted young men to break away from the collective farming group. The result is a decrease in household size and a decrease in the size of the units of production.

The decrease in the size of the units of production places additional burden on the wife who has to share the responsibility of the farm with her husband. In addition, the full burden of household duties falls on her. She now has less time to devote to her private field and source of economic independence.

Men are now growing peanuts. Peanuts are strictly an individual crop. Not only are men investing more time in the production of a private cash crop, they are also devoting extra time to the build up of their businesses. The result is that women spend an inordinate

amount of time in farm work that does not benefit her directly.

The limiting factor of production in this society is labor. Therefore the time spent in the collective field has a severely limiting effect on the time a woman can spend on her private field. Most of the women's dry season activity is financed with the cash from the sale of peanuts grown on her private plot of land. Her economic activity for the rest of the year is affected by the results of the winter crop. A poor harvest or a small field can severely limit the volume of business she can engage in during the dry season. I have found that with increased input of labor in farming, women have modified their expenditure of time in other areas.

Men have opted to become wage earners and in so doing, they have had to lessen their contribution as producers within the once self-contained village economy. They have forfeited their control over their own means of production for the ability to earn wages with which to buy goods and services produced outside of their villages. It is clear that they are responding to outside pressures over which they have very little control.

As wage earners men form economic relationships outside of their villages and outside of their family circles. Their wives and mothers have very limited access to these money making roles. As a result they are becoming increasingly dependent on men economically. This has had an effect on the concepts of marriage.

Economic Alternatives of Women

As the social relations of production that give her access to surplus labor and goods disappear or are modified, women find that they need more and more cash to buy certain goods and services. However, while money making opportunities for men have varied, women's alternatives seem to be narrowing.

Manufactured goods have replaced some of the industries that gave women access to wealth (*e.g. weaving*). Consequently, women respond to the mounting economic pressures by trying to increase their economic productivity along traditional lines, i.e. farming and marketing.

Other avenues are all but closed to women. Women are consumers of manufactured goods yet they have no opportunities to invest in them, as their husbands do.

The trade of manufactured goods requires greater contacts with urban areas and foreign language skills which women have not had the opportunity to develop. Reforms in farming methods, brought about by development agencies, still continue to assist men only. In cases where men engage in some form of scientific agriculture, their wives continue to cultivate with traditional methods.

The women's only form of participation in the new economic system is through the sale of peanuts. But while women are responsible for production of the bulk of peanuts (*80% in Kouri*), they are not in control of its distribution or sale. Nor do they have control over the prices they can ask for their produce. Even though women keep the profits from the sale, men make the contacts with the male buyers, and as middle-men, receive a small percentage of the money from the sale.

It is clear that mothers, while operating on the traditional values of building an independent economic base by investing in their sons, are inadvertently contributing to the dependence of women on men. Because men are the only participants in the new economic order, and as wage earners are the only direct beneficiaries.

Strategies of Adaptation and Change

The villagers are now looking for ways to expand their earning potential. Farming as a means of access to money is being undermined because of its low profits and constantly diminishing returns. The preponderance of creditors in the village attest to this. As a result of this, seasonal migration is on the rise in the community.

Some of the changes occuring in the communities are inevitable. However, the negative aspects of these changes may be minimized if long range effects of development policy are carefully assessed.

The effects of the drought on concepts of economic security and therefore on some of the types of aid, villagers are now willing to accept.

In this area, the immediate effects of the drought was felt in food shortages rather than in loss of

livestock. Thus members of the village have felt the pressure to increase production of the staple. Drought still threatens the villagers and so it is considered prudent to have as much reserve stock as possible. In addition, because of the growing demand for grain in urban centers, an increasing number of merchants are finding their way to the villages, in search of surplus grain. Older people see millet not only as a source of food, but also as a source of income. The pressure to create a surplus is great. Villagers respond to this pressure by trying to increase their food production. However, because of the low level of technology, the inaccessibility of surplus labor and the lack of scientific farming techniques, expansion of food production is difficult. Villagers have been receptive to advanced technology in all other areas. Yet, although they are conscious of new farming methods and have specified their needs in this area, farming technology has lagged far behind.

In various interviews the peasants have focused on their need for more advanced tools, agricultural expertise to instruct them in the ways in which they may ameliorate their farming methods, and animal traction. Unfortunately, there is a serious lack of materials and teachers with enough expertise in scientific agricultural methods. These problems exist despite government efforts. For example, the rural education center in the village has recently acquired ploughs to be used for instruction in ploughing. However, the school had not been supplied with donkeys and ploughing lessons had to be postponed.

The villagers are eager to learn, but in many cases they are not given complete information. In other cases they are informed, but do not possess the tools or the supplies needed to implement their newly garnered information. As a prelude to the use of animal traction, peasants are taught to plant in straight lines. Peasants realize the advantages of planting in lines, however, they lack the equipment with which to trace the lines (*rayonneur*). Without the rayonneur, planting in straight lines is time consuming and sometimes inexact. Sowing seeds in the traditional manner goes much faster. In the entire village there is one Fulani family (*the chief's*) which possesses one.

Peasants are also taught that it is detrimental to the soil to burn the stalks and shrubs left on the land. Although the ashes left

after burning provide potasse which fertilizes the soil, the long range effect of burning is to deprive the land of important nutrients. The peasants are aware of this, but the chief explained that if millet stalks and shrubs are cut down and allowed to rot in place, they would not decompose sufficiently to permit manipulation of the soil with hand tools. Preparation of the soil without animal traction would be impossible. Most of the peasants have not been taught how to make fertilizer from the organic matter. Millet stalks, shrubs and other debris could be gathered, placed in a pit, moistened and allowed to decompose during the dry season. The resultant fertilizer is then worked into the soil just before the planting season. This form of fertilizers is almost unknown in the area.

Residents of Kouri traditionally have used fertilizers. Because of the Fulani herds, Kouri has a large quantity of animal manure at its disposal. The villagers ask the herders to bring their cattle into the fields during the dry season. However, the manure is not allowed to decompose in a moist area before adding it to the soil. Usually the manure is simply allowed to remain on the ground where it is dried out by the sun and air and loses most of its fertilizing value. Additionally, manure is generally not worked into the ground before planting the seed. Artificial fertilizer is virtually unknown in the area.

The limiting factor of production in the village is labor. Increased production means increased labor input, and the use of larger areas of land. Many farmers have tried to increase production by farming large areas of land. More often than not they find that they are seriously behind in their weeding. At these times they organize weeding parties to help them catch up with their farming schedule. Work groups are costly, since the farmer has to supply food and drink. Since most of the food is bought, a large party may cost more than the sale price of the surplus produce.

New varieties of locally grown foods are always welcome. Villagers are interested in products with higher yields and shorter growth cycles, in order to cope with the progressive decrease in the rainy season. In the last years, the peasants have replaced indigenous cotton and peanuts with newly introduced varieties that require less rain and have higher yields (*see Appendix*).

Integration of Animals into the Agricultural System

The peasants have expressed an active interest in animal husbandry for various reasons.

1) Animal drawn ploughs increase the productivity of the farmer by making it possible to farm larger surfaces of land.

2) Traditionally, animals are a symbol of stored wealth and may be exchanged for grain in times of famine. They are also used as offerings in important religious ceremonies.

3) Many have expressed a desire to be able to care for their own cattle rather than leave them in the care of strangers whom they do not trust entirely.

Many peasants have mixed feelings about the possession of cattle. On one level, they are aware of the advantages of possessing animals, but on another, animal husbandry as they know it, conflicts with farming. At present much farming activity is limited by the presence of cattle. For example, when asked why cotton fields were as small as they were, some farmers responded that cotton required rich moist soil such that is found in the natural basins. At the end of the rainy season when the cattle are brought back from the bush, the last remaining grazing areas are found in the natural basins. Unless the cotton is harvested quickly, the cows will help themselves to the plants. Consequently, farmers limit themselves to the cultivation of smaller fields that can be harvested within a short period of time.

Money must be budgeted for training farmers in modern methods of animal husbandry that are compatible with farming. The peasants have requested a permanent cattle park with an adequate water supply. Unless such a park can be built, wandering animals will be a continuing source of conflict not only within the peasant community but also with the Fulani community. During every farming season, the local courts are beleaguered with complaints from farmers whose crops have been destroyed by hungry cattle.

Keeping the animals in one defined area would facilitate selective breeding and plough training. In addition, such a park would be a collection spot for manure, potentially useful as a fertilizer and fuel.

The villagers have also requested a vaccination park. The vaccination park in Piela is cut off from the cattle by compounds and fields. Since there is no accessible pathway, the park is inaccessible to the animals in Kouri. Amelioration of soil conditions are an effort to increase yield and prolong life of the soil and will help to abate the conflicts now arising between peasants whose land needs drive them to take over land used by herders. This is a complex problem that requires more in depth research and some

experimentation in order to find solutions.

Donkey Traction

The villagers are becoming more interested in donkey traction. Their interest in donkey drawn ploughs was exemplified this year in the following manner; the peasants were under the impression that they would be able to receive agricultural credit for ploughs if they procured and trained the donkeys. Five men bought donkeys in the hopes that they could receive the credit necessary for buying ploughs. However, the policy of the ORD changes this year, and the peasants did not receive the equipment they had so anxiously awaited. One of the men who purchased donkeys was a mobylette repairman and had been able to accumulate enough capital to buy a plough. He and the other owners of donkeys shared the plough. Furthermore, the school plough which was unused because of lack of animals was borrowed by the villagers who had access to the donkeys. Despite this, the owners of the ploughs did not use them to their full capacity. The ploughs were used in small fields of rice, corn, and other non-staple crops. Because of their lack of training, the farmers merely prepared the soil with the ploughs. The real effort of weeding which would have been greatly diminished by animal traction, was done by hand. They did not increase the size of their fields by using the plough.

Peasants were discouraged by the fact that the ORD only provides credit to the groupements headed by the agricultural extension agent in the village. As they see it, individual families are left out of this credit system. Nonetheless, it is said that the peasants have the latitude to form groups for credit involving the members they choose. The reality this year is that credit groups are formed with single members of different families.

Peasants in this area are motivated to act as economic individuals. The size of the units of production clearly illustrate this. In addition, it is the general trend to keep breaking down the size of the traditional units of production with each generation. In some ways the use of bovine traction may be in contradiction with the growing trend. Tom Zalla states that animal traction requires a minimum labor force. However, villagers are able to regroup themselves, as they do when extra labor is needed, while still retaining their individual farms. These temporal groupings are not anonymous. They are based on family ties and on close friendship ties. Even though a young man may have his own plot of sorghum he may still help his father regularly. He may also assist his wife with her personal peanut field.

So far the interest in donkey ploughs has swept the area. It is in part, related to the fact that the peasants are able to take a few more money risks. It is also related to the fact that donkeys are considered a sound investment for the following reasons. They are useful not only for ploughing but also for many dry season activities, particularly transportation of goods. In addition, they are relatively cheap to buy, can be easily cared for and housed, and have been known to the peasant for centuries. Peasants have always owned and housed donkeys. This is in sharp contrast with cows which are always left to the Fulani.

In summary, the villagers have shown an active interest in expanding production by ameliorating their traditional farming methods, however there is a lack of sufficient expertise as well as follow up programs to help the peasant in the implementation of improved methods.

Harnessing Water Resources

The major problem in the entire area is the lack of a perennial source of water. Daily searches for water is both time and labor consuming. Villagers complain about the distances they have to travel to find water once the wells dry up and about the depth of the wells. They have spoken about the pumps found on the wells of the Catholic mission and about the possibility of channeling water from the barrage to the center of the village.

The search for water is one of the principal duties of women. Food preparation requires a substantial amount of water. Women living far from wells shoulder a great burden, since water carrying can consume as many as three hours of daily activity. This does not include the water needed for washing or bathing. The result is that during the rainy season, women use the water found in ponds and rivulets close to their work sites. Water taken from these sources is a threat to the health of the villagers whose resistance is low because of malaria and an inadequate food supply.

More adequate and convenient forms of getting water from their sources to other parts of the village and learning water purification methods are needed.

Use of the Barrage

The use of the land around the barrage is a source of constant discussion among the farmers of Kouri. They cite as an example the barrage of Dabiesma which will be discussed shortly. Kouri's barrage was constructed in 1964 and has since been used primarily as a pastoral barrage. Some peasants farm

around the barrage, but they keep their fields small because of the frequency of cattle visits. Current farming methods are detrimental to the barrage, because each year tons of lose earth are washed into the basin. If the situation is not remedied, the barrage will be devoid of water in a few years.

It is hoped that the barrage can be used as a source of irrigation for crops grown outside of the farming season. This would allow for the diversification of crops without endangering food production during the rainy season. Crops grown off season are an important source of income and may be a safety valve in times of failure of traditional crops because of poor rain.

The barrage of Dabiesma is an example of successful though insufficient use of barrage irrigation. It was constructed in 1952, but irrigation structures were not completed unitl 1976. Residents of the village helped in the construction of canals. They were provided with sacks of millet in exchange for their labor. Six acres of irrigated land were prepared and were parcelled out in plots of 0.15 hectares. The agricultural extension agents and the farmers decided to grow rice, onions, tobacco, vegetables and new varieties of soy and sesame.

Last year rice cultivation yielded two tons per hectare. The farmers sold all their produce despite heavy competition from Niger and without the help of the ORD. Although they sold to private Ouaga merchants, they were able to sell much of their produce on local markets.

Barrage cultivation has served as a means by which new agricultural methods are taught to the villagers. There is an excellent agricultural agent in Dabiesma. He instructed the peasants in the use of donkey drawn ploughs (*in 1958 bovine traction was introduced to the village but failed to be assimilated by the villagers*), and the use and creation of fertilizers. The barrage project is considered a success by the villagers who are interested in doing the same in Kouri. There is some question as to whether the land around the barrage in Kouri is suitable for gardening. If it is unsuitable, the possibility of conducting the water to a more suitable area should be explored.

In addition to the construction of irrigation canals as well as the application of new farming methods, the single element that guaranteed the success of the Dabiesma reservoir project was a conscientious extension agent who followed the progress of the peasants closely and instructed them well.

Traditional Production Systems and Production Behavior

Last year's agricultural season was preceded by a year of relative prosperity. Many farmers have suggested that a period of relative prosperity affects production the following year. There is less pressure to produce when there is surplus from the previous year. This is particularly true in the production of non-staples such as rice. Rains arrived early in 1976, and the first great rain fell on April 30. The rainy season is usually interrupted by a two week drought around the end of July. Farmers expect this and adjust their planting schedule accordingly. However, the drought in late July lasted thirty days and much of the crops were severely damaged. The exceptionally long drought was followed by a much longer rainy season. Heavy rains are expected to end around the middle of September and there is a light rainfall in October. However, last season heavy rains continued until early November. Millet, which does not require much rain, suffered the most. High winds accompanying the rain interfered with the flowering of the stalks. The flowers fell off the ears before they had a chance to germinate and produce seed. Sorghum was battered to the ground before it could be harvested and rotted in the excess humidity. Peanuts regerminated while waiting to be harvested.

Those who planted in the bas-fonds had even greater losses. The bas-fond is low land and has more water than higher areas. Beans and sesame, which are usually planted along with sorghum, were washed away or rotted in the water soaked soil. A variety of rice that does not require much moisture is also grown in the lowlands and was damaged due to the excess rain.

At the end of the farming season people anticipated famine even before the beginning of the rainy season. Many of the foods, such as corn, rice, and beans, used in daily food consumption, had failed. Only sorghum did not suffer serious damage, but it was weaker than usual. The resulting food shortage was severe and had repercussions during the entire season, particularly in the area of commercialization.

Agriculture and Marketing 1975-1977

Agricultural Calendar

Late April (*preparation of fields*). In many cases preparation consists of cutting down trees and shrubs. After the fields are cleared, the remaining stalks and stems are burned. New fields are cleared with the help of work groups organized by the proprietors. (*Work groups may include relatives and friends from various villages.*)

Early May-Beginning of June *(preparation of soils)*. The first rains occured around the middle of May this year. Cultivation starts officially after the second or third rains, i.e., within a week to ten days of the first rains. After the third rain, the soil is soft enough for tilling.

June *(sowing)*. Early morning and late evenings are devoted to work in individual fields. Most of the day's work is done in the family field. The fields require constant surveillance at this time in order to protect the newly planted seeds from being eaten by birds. Permanent residence is then established in the fields. Those living in the fields during the agricultural cycle usually live more than a mile away from their work sites.

July *(weeding and hoeing)*. Most of the agricultural activity is centered around the care of new plants. Constant weeding and hoeing are necessary. A small percentage of farmers had just begun sowing in July. The lateness was due to illness, death or other family disruptions. There were a few farmers who had sown for the third time. Their first and second sowings had failed to produce seedlings.

August. Weeding and hoeing continues although activity is not as intense as in the previous months. More time is devoted to individual fields.

September. Corn is harvested from the middle to the end of September and breaks the period of famine characteristic of the planting season. Small portions of the millet crop begin to ripen while weeding is continued in the other fields.

October. The beginning of the peanut harvest and the last of the corn is harvested and stored. Other products have begun to be harvested at this time. Rites for harvesting the first grains of millet have already been celebrated. Work groups are formed in order to harvest peanuts. Part of the tobacco, rice and cotton crops have already been harvested. Productions of secco *(large straw mats used in the construction of compound walls as well as roofs for houses)*, is at its height. Much of it is used as an additional source of revenue when the villagers sell it in the surrounding villages. Market activity is more li vely than usual, since less time is spent in the fields and there is a greater variety of products on the market.

The following planting schedule is largely dependent on the amount of each crop needed for consumption. Thus, sorghum and millet are planted early since they are usually the largest fields.

Planting and Harvesting Schedule

	Planting	Harvesting
Sorghum	June-July	Nov.-Dec.
Millet	June-July	Nov.-Dec.
Peanuts	July	Oct.(short cycle) Nov.-Dec.(domestic peanuts)
Corn	July	Sept.-Oct.
Rice	July	Oct.-Nov.-Dec.
Cotton	July	Nov.
Beans	June	Oct.
Pois de terre	July	Nov.
Sesame	June	Oct.-Nov.
Gumbo	July	Sept.
Tobacco	Sept.	late Oct.-Nov.-Dec.

Inventory of Agricultural Products - 1976

Main food crops in order of importance: Petit mil, sorghum, corn, pois de terre, gumbo (*last two are garden products*), and rice. The main cash crops in order of importance are: peanuts and sesame.

Crops used in the manufacture of products are: cotton--used for making thread and weaving; Liane--fibrous plant used in making ropes; Indigo--extensively used for dyeing village woven cloth; tobacco--processed and sold within the village.

Other crops are sugar cane and yams.

Varieties of Sorghum and Millet

The villagers grow nine locally known varieties of sorghum; Belco, Yensongou, Dedanukanfiaiai, Tankobidjoyenga, Tankobri, Didjie, Dimoanmoanga, Tchuari and Tchuaridjiedjie. The following is a discussion of the properties of each variety as described by the villagers.

Sorghum is a more recent cereal than millet. Originally it was rarely cultivated. According to Senegal, its production was stimulated by the neccessity to supply colonial authorities with a certain amount of cereal per year, which was used to feed laborers. It was quickly accepted by the population because of its higher yields. However, the peasants believe that petit mil is still more adaptabe to the environment since its yield is greater in poor soil than sorghum.

However, it is much easier to separate the grain from the ear of sorghum than it is to separate the grain from the ear of petit millet. Peasants say that a young man without a wife would do better to grow sorghum rather than petit mil, since petit mil requires pounding with a mortar and pestle in order to separate the grains. Sorghum does not need pounding. This aspect, as well as the higher crop yield, makes it very popular among men. Older women may also grow it, but younger women do not.

In this village sorghum is grown in larger quantities than petit mil because the soil is relatively rich. In other villages petit mil is grown in larger quantities.

In general, more sorghum is sold than petit mil.

Belco

Of all the white sorghums this is grown the most. 103 out of 135 fields of sorghum are Belco.

Uses: Millet cakes for daily consumption and dojo, millet beer.

Rain needs: Does not require much rain. Too much rain stimulates the growth of the plant, but stunts the production of seeds.

Soil requirements: Generally grown in bas-fonds where soil is richer and hydromorphous.

Maturation time: About four months. It is usually planted in June before the other crops are planted. It ripens earlier than other millets and may be harvested before the end of the rains.

Yields: High.

Conservations: Three or four years.

Tchuari

Grown by all and in small quantities.

Color: White and makes white flour.

Uses: Eating only.

Rain needs: Less than Belco. Rain must be over completely before harvesting.

Maturation time: Ripens last of all the cereals.

Yields: Not very high.

Soil requirements: Terre argileuse.

Conservation: Two to three years.

Tchuari Djie Djie

Grown in small quantities.

Color: White.

Uses: Eating, medicinal and magic purposes.

Rain needs: Relatively little rain.

Soil requirements: Needs relatively rich soil. It is grown primarily in the soil of the natural basins.

Maturation time: Ripens late at about the same time as Tchuari.

Yields: Higher than Belco.

Conservation: Two years.

Dimonmonga

This variety is grown close to the village or home in small fields. It is grown in very small quantities and originally it was used to feed horses.

Color: Red.

Uses: Used in the manufacture of dolo and eaten. It is usually sold in Puytenga where it is higher priced than ordinary sorghum.

Rain needs: Very little rain.

Soil requirements: Satisfactory yields in poor soil.

Maturation time: Ripens very early.

Conservation: One year.

Yensongou

Not as widely grown as Belco. 13 fields in 1977.

Color: Black and white.

Uses: Eaten as millet cakes and used in making dolo.

Rain needs: Requires less rain than Belco. Too much rain destroys the plant.

Soil requirements: It is planted in the soil of natural basins, but may also be planted on higher ground if the soil is good.

Maturation time: Ripens early, around the same time as Belco.

Yield: Has higher yield than petit mil but not as high as Belco.

Conservation: Three to four years.

Didjie

Grown by all in small quantities. This year, 2 large fields were grown by people whose millet supply was exhausted early.

Color: White.

Uses: For eating and making dolo. Used in making millet beer to celebrate rite of the new millet harvest.

Rain needs: Very little rain.

Soil requirements: Does not require rich soil, farmers say that it has the highest yields on poor soil of all the sorghums. It is usually grown around the corn fields near the homes.

Maturation time: It ripens before all the other grains. Farmers know that when this sorghum is ripe, all the others are close to ripening. However, because of the rapidity of the ripening period, it is a great attraction to birds. Anyone who has grown a large field risks great losses to birds if he does not harvest immediately.

Yields: Higher than Belco.

Conservation time: Around two years.

Tankobri

In the past when horses and donkeys were the only means of transportation, this millet was grown in fairly large quantities and used as fodder. Only 9 fields have been planted this year.

Color: White.

Uses: Dolo and daily consumption.

Rain needs: Less than Belco.

Soil requirements: Usually grown in bas-fonds.

Maturation time: Ripens at the same time as Belco.

Conservation: Two to three years.

Dedanukanfiai

Hardly grown. One field in the village.

Uses: Daily consumption and dolo.

Soil requirements: Grown in natural basins but may also be grown on higher ground. Preferably argileux soil.

Maturation time: Rain must have ceased completely in order to be harvested.

Rain needs: Less than Belco.

Yields: Same as Belco.

Conservation: Two to three years.

Millet (Pennisetum americanum)graminea

This year there were four varieties of millet grown in the village. The villagers named them; Bidjia, Paragou,

Ifoadu, Pkaikayitani.

Bidjia

This is the most widely grown variety. Of 233 fields grown, 172 are of this variety.

Color: White.

Uses: Eating and magical purposes.

Rain needs: Less than sorghum.

Soil requirements: Planted primarily in the soil of natural basins where yields are highest. Requires better soil than other varieties.

Maturation time: Ripens quite late. It is usually planted at the same time as sorghum, but it is generally not harvested until mid to late November. It cannot be harvested before the rains end.

Yields: Higher than the other varieties of millet.

Conservation time: With insecticide, it may be conserved for two years. Without it may be conserved for a year.

Paragou

This is the second most widely grown variety of petit mil. There were 38 fields in 1977.

Color: Red and white.

Uses: Eating and magical purposes.

Rain needs: Little rain.

Soil requirements: Requires sandy soil. It is generally not grown in the natural basins. Best yields of all other varieties in poor soil.

Maturation time: Quickest to ripen.

Yields: Lower than Bidjia.

Detailed Description of Varieties of Peanuts

Varieties Known to the Villagers

There are about four varieties known to the villagers. Most of these are no longer used because of a lack of enough rainfall.. The villagers divide the varieties into two categories: Gourma and European. The Gourma variety includes Tingfoa, Pangoaari, Tingkoabish. The European variety is the TE3 and currently is used by the villagers. This year, 77 fields of indigenous varieties were planted while 274 fields of European varieties were planted.

The following is a discussion of the characteristics of each variety.

Pangoaari

Characterized by large grains. It needs more rain than other varieties. Sandy soil. Yields are low. Conservation time about one year. Growth time about 120 days. Currently in disuse because of low yields and high moisture requirements.

Tingfoa

Long variety with three grains in each shell. Sandy soil with much manure. Needs a lot of rain; low yields. Conservation takes about one year. Not grown in many areas because of obvious disadvantages.

Tingkoabish

Short variety with two grains in each shell. Sandy soil gives best yields in bas-fond where much water is available. Needs much water. High yields. More frequently grown than the other varieties because of its high yields.

Peanuts 90 (TE3)

Requires only 90 days to mature. Sandy soil. Needs less water than indigenous varieties. Yields higher

than indigenous varieties. Most cultivated variety. Must be harvested promptly after 90 days or else regerminates quickly. Sometimes harvesting conflicts with peasants schedule. As was the case last year, much of the crops were lost because of regermination.

Number of Households Growing Crops 1976 - that they did not grow the year before. (None of these crops are new to the village).

7	%	of compounds	cultivated	beans
10.2	%	"	"	cotton
5	%	"	"	tobacco
3.5	%	"	"	sesame
3.5	%	"	"	millet
5	%	"	"	pois de terre
5	%	"	"	sorghum

Crops new to the village and surrounding areas; soybeans, new varieties of corn and a new short cycle sesame have been introduced to the neighboring village of Piela. None of the farmers in Kouri have grown them as yet.

Percentages of Households Growing Each Crop 1976

100%	of all households	grew sorghum, millet or both
98%	"	peanuts
95%	"	corn
37%	"	tobacco
65%	"	pois de terre
75%	"	sesame
80%	"	haricots
56.8%	"	cotton
14%	"	rice
63%	"	gumbo
2%	"	yams

System of Measurements Used in the Village

Units of measure given are tasse, calebasse, tine and panier. Accurate conversion tables are not available

yet. Within the system of measurement, peanuts in the shell are measured as follows:

1 panier equals 4 times unshelled peanuts
1 panier equals 2 times shelled peanuts

Estimate of Quantities of Each Crop Harvested by Entire Village Last Year

Sorghum	1,305	granaries
Petit mil	144	granaries
Cotton	111	paniers
Peanuts	1,413	tines
Sesame	319	tines
Beans	227	paniers + 58.5 tines = 600 T
Corn	324	packets (120 ears of corn each) + 1 large granary and 2 small ones.

Estimate of Quantities of Each Crop Sold

More than 90% of the peanut and sesame crops were sold last year. Prices for peanuts and sesame fluctuate according to the season and the company buying them. In November, peanuts are usually sold at 350 CFA francs per tin. In December and January, they are usually sold at 500 CFA francs per tin.

In November sesame sells for 400 CFA francs per tin and 6,500 CFA francs in December. Farmers are reluctant to sell to the ORD since their buying price is usually lower than private companies.

Very small quantities of sorghum and millet are sold. They are usually sold within the village. The ORD sometimes encourages the villagers to sell them their surplus of millet. This is stored in special granaries, creating a grain reserve. Other villagers sell their grains to private merchants who transport it to urban markets.

Beans are usually sold in the village and the local markets. Corn is usually not sold.

Percentages Of Men And Women Working In The Fields

361 out of approximately 600 villagers work in the fields; that is 180 men and 181 women. Approximately 67% of all men and 69% of all women work in the fields.

Agricultural Activity According To Sex Of Participants

Peanuts--grown primarily by women but growing in popularity with men. Of 213 peanut fields, 171 are grown by women.

Sesame--sown in collective millet and sorghum fields but falls under the jurisdiction of men.

Cotton, tobacco, maize are also under the jurisdiction of the male population.

Women are the only producers of gumbo and pois de terre.

Discussion Of Production Losses And Sale Of Each Crop (see Charts I, II, and III).

Sorghum and Millet

Many studies have pointed out that in subsistence economies alimentary needs are of primary importance, the satisfaction of which takes priority over all other production. This is true in the case of Kouri. Sorghum and millet are the two most extensively cultivated crops. These are the main food crops, constituting the main portion of the daily diet. They are also used to manufacture millet beer brewed for all festive occasions. In addition, selling millet products such as couscous, millet balls, fried cakes, etc., is one of the ways women engage in marketing activity. The outcome of the millet harvest has a momentuous effect on the economy of the year ahead.

Volume of Produce

As aforementioned, most sorghum and millet is grown in collective plots cultivated by the family. Women grow individual plots of millet. As the chart shows about 97% of the millet is grown collectively.

Of 8,000 tins (about 144,000 kilos), only 700 tins (12,600 kilos) were grown in individually owned fields.

Losses:

Millet losses were twice as much as they were in sorghum. In general, the villagers grow more millet than sorghum. This year's harvest shows a higher sorghum crop than millet. Losses were calculated by the villagers in the following manner. They explained that they planted as much as they had the year before. All things being equal, they expected about the same yield as the previous year. Yields substantially below expectation were considered losses. See introduction describing farming season.

Sales:

Most of the millet is used to feed the family in the coming year. I have estimated, according to measurements made over several months at different times of the year, that a family of 20 (7 grown men, 8 grown women, two teen-age men, and three children), consume about 22 tins of millet per year. A rough estimate of the volume of millet needed for a village this size would be 6,700 tins of millet per year. Thus the village surplus is 17%.

Not all families benefited from a surplus in 1976-77. Many families have been forced to buy millet since April 1977. Their alimentary needs are much greater during the season of active farming that begins in June. Thus their expenses were even greater. Many villagers were severely malnourished.

The 17% surplus in the village of Kouri is not characteristic of the area. Kouri and two other villages function as breadbaskets in the area. These are the only villages that, because of the nature of their land, usually have a surplus of millet. By April, villagers reported that they had sold 8,000 kilos of millet. These figures may be slightly understated and include sales to private merchants as well as to families.

Women lost about 60% of their produce this year, a factor that has greatly influenced the volume of trade in the village markets. Many women have had to purchase millet at exceptionally high prices this year. As a result, they have had to purchase in smaller quantities than in previous years. They have also had to raise their prices. Since their clients also had losses, their volume of business has dropped seriously. Profits are usually small for women and are even lower this year.

Peanuts:

Kouri is located in the Cercle of Bogande, the area that produces the largest volume of peanuts in all of Upper Volta. Peanuts grow well in the sandy soil characteristic of this area. Peanut fields usually replace disused sorghum and millet fields. So, the preparation of the soil is minimal and because of the size of the plots, fewer hours of work are required to maintain it. All peanut fields are grown individually by young men and women. Older men rarely grow peanuts.

Volume of production:

Last year the village produced 4,200 tins of peanuts, equal to about 54,400 kilos, 3,400 tins or 58,560 kilos were produced by women. Women produced more than five times as many peanuts as men. Women produced 81% of the crops. Of 213 peanut fields in the village, 171 or 83% are cultivated by women. I have no field measurements, so it is difficult to get an idea of the yield for women as opposed to men. But soil conditions are fairly the same, and parcel sizes, are fairly equal for most individuals, except in cases where the person is deliberately trying to harvest a larger than average field for reasons that will be discussed under sales.

Losses:

Only half the households were interviewed about the volume of their losses. Much of the peanut harvest regerminated this year because of the excess moisture and the delay caused by the peasants inability to harvest the millet crops. The variety of peanuts grown by most of the villagers, must be harvested promptly after ninety days or it will regerminate. One old woman who had to wait until her son harvested his millet to harvest her peanuts, lost two thirds of her crop.

Women generally reported losses of about 35-40% while men reported losses of 50%.

Sales:

Villagers sold about 3,660 tins of peanuts this year (approximately 58,560 kilos). The chief reported that in a moderately favourable year they may sell as many as 6,000 tins or 96,000 kilos. Families usually sell together. Sometimes whole sections of the village will combine their produce and sell to one merchant. The sales representative will receive a commission of about 100 CFA for each sac (6 tins) of peanuts sold. Merchants also supply the peasants with hand machines that remove the peanut shells. Men sell most of their produce leaving just enough for next season's planting. Women keep about twenty percent for processing oil and marketing and supply their sons and daughters with grain for planting.

It seems that for most young male and female peasants, their initial source of cash comes from the sale of peanuts after each harvest. They depend on these profits to enable them to invest in business for the coming year. Young men that were interviewed said that the origin of the initial business investment or the travelling fare used to migrate to Niger or the Ivory Coast, came from the sale of peanuts. Women use cash revenues to buy raw goods for their business activities during the dry season.

It is hard to ascertain the amount of income derived from the sale of peanuts. Not all peanuts are sold at official prices. The money need of the villagers usually surpasses the income derived from their production of peanuts. Private merchants take advantage of the relative poverty of the villagers during the rainy season and buy peanuts before they are harvested, at half the normal price.

Sesame:

Sesame is usually grown in the large millet and sorghum fields. Most of the sesame grown in individual plots is grown by women who sow it around their small millet fields.

Volume of production:

The village produced a total of about 83 tins of sesame this year, approximately 2,928 kilos. Of these 36 tins were produced by women, roughly twenty five percent of total production.

Losses:

Sesame and millet, suffered heavy losses this year. Total loss was estimated at 246 tins or 57% of the crops. Women lost about 60% of their estimated yields while men lost about 56%.

Sales:

Most of the sesame is sold outside of the village. About 72% of the total crop was sold as of April 1977. Women sell a little less than men. Sesame is used as an ingredient in sauces and is used to make oil and small sugared cakes sold on the market. Prices per tin of sesame start at 500 CFA at the end of the farming season.

Corn:

The ripening of the corn crop signals the beginning of the harvest season and the end of the "famine". It is one of the most appreciated foods. If the harvest is good, half the corn is consumed during the month and a half following the harvest. The rest is stored and consumed for a month and a half at the beginning of the farming season. A good corn harvest minimizes the gravity of a shortage of millet as the corn may be consumed for at least three months of the year, leaving the millet for the time of year when it is in greatest demand, the agricultural season.

Volume of production:

The measure of corn produced in the village is unreliable. People reported their yeilds in packets and a packet may vary from one and a half to two tins. Nonetheless, in relative terms we have an idea of the degree of loss that the villagers suffered this year.

Corn is grown collectively in the small parcel of land surrounding the compound. This parcel is usually rich in manure. The village produced around 400 packets of corn this year.

Losses:

The 1976-77 corn harvest was dismal. The village lost more than 60% of its expected yield because of the August drought. This loss has considerably diminished their alimentary resources as discussed above.

Sales:

Corn is rarely sold, but is given as tribute to village chiefs or as gifts among family members and close friends.

Cotton:

Cotton is grown in small, individual plots by young men married and single. There are two varieties of cotton known to the villagers. One is the more recent "European" variety as the peasants call it, the other is the indigenous variety. The European variety requires less water. Of 97 cotton fields, 95 were sown with the "European" variety.

Much of the cotton is kept within the family where the women convert it to thread. Cotton cloth is an indispensable offering in religious ceremonies.

Volume of production:

Peasants measure their produce in large baskets of cotton weighing about ten kilos called paniers. This year the peasants produced about 120 paniers of cotton. Cotton is usually grown in the bas-fonds, and was subject to inundation this year.

Losses:

Losses were heavy this year. Young men lost about fifty-eight percent of their crop.

Sales:

Some cotton is sold at the village market. Accurate figures are unavailable, but a representative sampling shows that about 50 percent of the cotton produced is sold on the village market.

Rice:

There are three varieties of rice grown in the area, known locally as Alkanrienga, the most widely grown, Bonga and Gambiaga. All are varieties that do not require much water and thus suffered from inundation this year.

Like cotton, all rice is grown in the bas-fonds. Rice is somewhat of a prestige food in the area. Those who cannot afford to eat it often will usually eat it on festive occasions. It is usually grown by men, but women process it by removing the husk. Women may then resell it, prepared for immediate cooking. Both men and women run restaurants in which they sell cooked rice on market days. It is an expensive food but a favourite with visiting merchants.

Volume of production:

Fewer people planted rice in 1976 than in the previous year. Total rice produced amounted to 130 tins or 1,820 kilos.

Losses:

Villagers lost 65 tins of rice, approximately 33% of their expected yield.

RELATIONS POINDS - VOLUME IN KG

Ref.: Note Commercialisation due 29-12-1976

Mesures	Riz Paddy	Arachide Coque	Arachide DC	Amande Karite	Sesame	Soja	Maricot	Mil	Sorgho
Double Decalitre	12	6	13,5	14	13	16	17	16	17
Tine Commercant	14	7,5	16	17	16	21	18	18	19
Assiette Yoruba	2	1					2,8		

CHART I - ESTIMATE OF SALES 1976

Product	Men	Women
Sorghum		8,000 ks
Millet		
Peanuts		87.1% = 3,660 tins
Sesame	110 T = 74.8%	23 T = 64% 133T = 72.7%
Haricot	not available	not available
Corn	figures unavailable - very small percentage sold	
Cotton	Exact figures not available - about 50% sold on market about 50% sold in village	
Rice	113 T = 80%	113 T = 80%
Tobacco	Exact figures not available - most sold	
Pois de Terre	not available - very little sold	
Gumbo	not available - very little sold	

CHART II - ESTIMATED LOSSES 1976

	Collective	Individual Men	Individual Women	Total
Sorghum	1,400 T = 30%	-	400 T = 60%	1,400 T) 43%
P.Millet	1,600 T = 30%			2,000 T)
Peanuts	Accurate No's Unavailable	50%	35%	-
Sesame		194 = 56.6%	52 = 60%	246 = 57%
Haricot		200 = 34%	15T = 38%	215 = 53%
Corn	450 = 60%			
Cotton		71 = 38.3%	3 = 30%	74
Pois Terre		3 = 48%	49 = 52%	52 = 49%
Gumbo		0	30 = 60%	30 = 60%
Rice		66 = 33%	0	66 = 33%
Tobacco		N.A.		N.A.

CHART III - ESTIMATE OF PRODUCTION 1976

Item	Collective	Individ. Men	Individ. Women	Total
Sorghum	4,500 tins	-		4,500 t
Millet	2,800 tins	-	700 t	3,500 t
Peanuts	-	800 t	3,400 t	4,200 t
Sesame		147 t	36 t	183 t
Haricot	-	170 t	25 t	195 t
Corn	400 pck			
Cotton		121 p	6 p	127 p
Pois de terre		4 t	51 t	55 t
Gumbo		24 t	0	24 t
Rice		130 t	N.A. very little	130 t
Tobacco		58 t	0	58 t

Pck = packet of 60 or so ears - exact figures unavailable

p = paniers = about 10 kilos in weight

Sales:

Roughly 80% of the rice was sold. It was sold primarily within the area. Generally the largest buyers are private merchants who resell it in urban centers.

Beans, pois de terre, tobacco and other garden products suffered large losses due to inundation. Tobacco is usually sold within the village and in the village market.

Effects of Losses on Trade Volume:

Trade volume of nationally sold goods such as peanuts has lessened. Villagers try to make up their financial deficit by selling valuable personal objects such as mobylettes. More than half were sold by April 1977.

Volume of intravillage trade has also diminished. Women report buying and selling in smaller quantities than before.

Although the volume of intravillage trade has decreased, contacts between neighboring villages seems to be stimulated by the food shortages. Rice shortages for instance, have forced many "restauranteers" to try to buy some in neighbouring villages. Shortages of millet induces villagers to activate their kinship links in other villages. Thus wives are sent to their natal village in search of millet. Mothers send messengers to their daughters in other villages, asking them to purchase millet for them. In this way, intravillage contacts are strengthened.

Livestock:

Dogs, goats, fowl, sheep, cows and donkeys are common livestock that both men and women own. Young children are in charge of goats, sheep and donkeys and cows are left with the Peulh of the village.

Number of animals owned by the villagers last year:

Cattle bovine:	56	
Assine	5,	two have been sold recently
Goats	380	
Sheep	380	

The average family has ten to fifteen heads of goats or sheep.

Only nine families own cattle. One family owns twenty heads while the others own about four or five herds.

Pigs are considered a nuisance especially during the farming season. Many are bought and sold within the dry season and are rarely kept for long periods of time.

Animals are an important means of storing wealth. They get a high price in times of plenty and in times of famine may be exchanged for food. The price of cattle has skyrocketted in the last four years. In 1972, a donkey could be purchased for 1,000 CFA. In 1976, the price was at least 12,000 CFA. Part of the reason has been the increase in use of animals for transportation of goods as well as for farming.

Animals are also used as offering for bride-wealth sacrifices, funerals, births, illness and various religious occasions.

Care of animals:

Cattle: Cows are kept by the Peulh. In exchange for their services, the Peulh caretaker may receive a regular supply of millet. Certain people who leave large numbers of cattle with their Fulani neighbours leave as many as three tins of millet per week with them. If the cow is sold, the person is expected to leave two pagnes plus two thousand five hundred francs with them. For others the care of animals is not as costly. Each situation is individual; a woman may give practically nothing for the care of her cow while a family will take the responsibility of feeding a Fulani neighbour if he is poor and/or old.

The caretaker of the cow has full rights to its milk during the rainy season. Although if one has cows, one may request some milk for special festivities.

The Fulani may be asked to bring cows into fields in order to supply manure. If the fields are old, they may require four months of manuring. The usual rate for this service is a tin of millet per week.

Donkeys: Younger members of the household are in charge of donkeys. Donkeys are taken out to the fields around six in the morning. They are kept outside all day until the evening when they are tied up in the concession. They are usually fed millet. Asses are not sensitive to rain and may be kept unsheltered.

Goats and Sheep: Goats and sheep are also taken care of by children. Early in the morning the children take them out to the countryside far away from the fields. There is usually a shed made for the goats because they are very sensitive to rain. The animals are brought home in the evening.

During the dry season, they are kept as long as possible in the corn fields so their manure can fertilize the area.

Purchase and Sale of Animals:

Individual purchasing of animals is done among neighbours. Men are usually responsible for the purchase of animals. Purchase price varies according to the destiny of the animal. If the animal is to be consumed, it is usually thinner and in poorer health than an animal which is to be kept for breeding purposes, therefore it fetches a lower price.

Most villagers sell their cattle either at the local market or at Puytenga and some sell them in the Ivory Coast. Usually, 60 or 80 heads of cattle are gathered and sent with a few people to the Ivory Coast where the purchasing price is much higher.

Villagers have stated that animals such as horses and donkeys were once kept in much greater numbers in the villages. They were the only means of long distance transportation. They have fallen out of use with the advent of bicycles and mobylettes. However, they have recently begun to regain importance because of their use in farming and in transportation (charrettes, etc.).

There are several marketing circuits operating within the village. I labelled these circuits, international, national, intervillage and intravillage. Degree of participation in each circuit varies according to sex, age and social position of individuals. The development and history of these circuits has a direct relationship to the economic evolution of the society. The following is a brief description of each circuit as it applies to the villagers.

International Circuit: Within this circuit goods produced internationally are bought and sold. In the case of the villagers this marketing circuit is a buyers circuit. Few of the goods produced in Kouri are sold internationally while goods produced internationally are bought in substantial quantities by the villagers (flashlights, watches, radios, bicycles, mobylettes, gasoline, etc.). These items purchase in Puytenga or Quagadougau are brought to the village by professional merchants.

National Circuit: Villagers participate in the national economy by their production and sale of peanuts and cereals. These goods are generally bought by professional merchants based in large urban centers. Peanuts are sold to local and foreign refineries, while millet is sold to private consumers in urban centers.

Intervillage Circuits: Each village hosts a market every third day. Care is taken not to conflict with neighbouring villages market days. The largest local market is located in Piela. Villagers from miles around congregate here to sell locally produced and manufactured goods. Women are active participants in these traditional markets. Village markets are the traditional and oldest marketing circuit in the area.

History of Development of the National Marketing Circuit:

Very little has been written on the economic history of Northern Gourma. Most of the information I have managed to garner has been through interviews. The following history was related to me in an interview with an extension agent who had worked in the area for the past 28 years.

In 1950, through the efforts of the chief of Piela, peanut production as a cash crop was officially initiated in the cercle of Bogande. At the time all peanuts were marketed in Fada M'Gourma. One merchant from Dahomey (now Lenin) purchased the peanuts collected from the entire Gourma region.

There were two buyers in 1958. One was a private merchant situated in Kaya, the other was an organization known as Volta Pro. The next increase in numbers of buyers occurred after 1970. Since 1972, there have been more than seven regular merchants in the small village of Kouri.

Official estimates show that from 1947 to 1972, production of marketing peanuts has increased four fold in this area (Senegal 1973). This region produces the greatest percentage of the cash crop grown in the country.

Private merchants vs. the ORD: The ORD is a government run agency designed to promote agricultural development in all of Upper Volta. Its programs are intended to assist peasants in all areas of agricultural activity, including modernization of agriculture and marketing. Until recently, it was illegal for private businessmen to purchase millet in large quantities. In theory the ORD was the only legal buyer. The ORD was

supposed to provide a market for the surplus millet produced by the peasants. Some of the millet would be kept in storage. In times of shortage the millet could be resold to the peasant at a reasonable price, thus eliminating the possibility of private speculation. (Private buyers purchase millet at low prices during the harvest season and resell it at exorbitant rates during times of scarcity).

Despite these advantages, peasants rarely sell to the ORD for the reasons are varied. The first reason given is that the private merchants purchase at a higher price than the ORD. It is true that the Eastern ORD has had very limited funds and a low level of organization because of a lack of personnel. Many villagers never even come in contact with an agent during the harvest season. I was told by one of the extension agents that the Kaya ORD purchased more peanuts from the area than the Eastern ORD.

The second reason is the strength of the credit system established by merchants in the villages from which they buy.

Once a private merchant establishes himself in a village, he chooses several "representatives" with whom he leaves a certain amount of cash during the year to use to buy produce. The most profitable buying period is during the rainy season. At this time the peasant is most hard pressed for cash. His food provisions are low and much of his cash has been spent on vital necessities. The farmer may find himself in an emergency situation requiring an unexpected expenditure of cash which is hard to borrow from equally impoverished friends and relatives. These pressures may force him to sell his crops while still on the stalk at half the normal anticipated price. The creditors collect his grain at harvest time.

It is difficult to know exactly how much grain is marketed in this way within the village. It seems, however, that very few families manage to escape this form of credit. Statistics show that more than 80% of agricultural produce in Upper Volta is marketed below the price set by the ORD for this very reason.

A farmer who has to ask for credit one year may remain in the red for several years. Four thousand CFA francs in credit represents at least 8,000 to the farmer, and in times of scarcity his loss is even greater.

Credit systems of this nature keep the purchasing price of millet low despite scarcity. A peasant who has sold his millet at 250 per tin may have to rebuy it at 1,050 per tin at a later date. The price range of millet from January 1976 to October 1977 in the village of Kouri, went from 350 to 1,050 CFA francs per tin. Yet many peasants hardly see an advantageous increase in the selling price of their produce.

As the society becomes more monetarized and the peasant has less control over his purchasing power, credit networks will expand and exert an even greater hold over village farmers. Measures must be taken to protect the peasants from this possibility.

Women in Development:

In interviews that I have conducted with village women, they stressed various elements that they consider necessary to accomplish their goals. Among the most frequently stressed, are: instruction in modern techniques of health care for children and in modern farming methods, getting labour saving devices for food processing and obtaining water and ways to expand their economic activities. Before development agencies can begin to address themselves to these needs they must be conscious of: 1) women's every day work schedule and other factors influencing her available time, 2) her social and economic goals, and 3) her mobility.

Sexual division of labour and women's available time: Ecological and political factors have drastically altered women's traditional roles in the division of labour. In the past hunting and warfare occupied much of men's time. Sexual division of labour in terms of time was fairly equal. However, since colonial times, men no longer engage in warfare. The gradual disappearance of the bush has curtailed men's hunting activities. Yet, women's traditional activities have undergone few alterations. There is evidence that proves as the size of the family and unit of production has decreased, women's workload has increased. Women's work is heavy during the dry season since it is mainly concerned with the preparation of food. However, it is particularly heavy during the farming season, when agriculture work is added to everyday household chores.

The weight of women's work load, and the resultant rigidity of their daily work schedule must be kept in mind when designing training programs for village women. One of the first matters to be considered should be labour

saving devices for women's daily activities. It must be added, that despite the rigidity of their daily schedule, women find time to keep appointments for their infants at a clinic located more than 10 km away. They are also capable of forming work groups with other women, as well as participating in those called by men. Yet lightening of their load through inexpensive energy saving technology should be considered and explored.

Another factor to be conscious of is the women's physical mobility. In small villages most women marry out. This means that for young unmarried girls, there is a break in continuity of certain activities started in their natal villages. The traditional young women's age groups are instable, as they are constantly disbanding with the marriage of its members. However, women who are married with children tend to be permanent residents of the villages. Development programs should address themselves primarily to the needs of these women who represent, along with older women, the more stable and in some ways most physically burdened members of the village.

People seem to equate the heavyness of women's economic burden with submission and oppression. Without looking at the historical development of women's roles -- they conclude that men are lazy and pile the burden of work on the women's backs. The changes in men's economic roles have been discussed previously. But it is important to note that the preponderance of women's role in daily economic life attests to her economic importance, and to the control she has over her economic destiny. The importance of her economic contribution is recognized by all. It has only been recently in history that women's traditional economic activity has been devalued. (*See Boserup 1963*). In the past, when wage labour was nonexistent, women's and men's activity had equal value and sometimes women's traditional activity was considered more important. At the present time, women's labour, as such, is not remunerated; only men have access to wage earning jobs. Hence women's traditional economic activity is gradually losing prestige while it has no monetary value.

Nonetheless, women are still extremely socially and economically independent. Their economic goals clearly illustrate this.

Previously, I have discussed the economic role of women and the importance of their part in furthering the economic alternatives of their sons and husbands. Women in traditional economic structure are self starters, the individual nature of their participation in economic activity makes them well suited to take advantage of the present economic climate. However, the women's participa-

tion in developmental programs is minimal. Aside from prenatal and child care clinics, very few development programs are directed to women. When I first came to the village, few villagers understood my role as an anthropolgist, many thought that I had come to the area in order to "instruct" women the way some of the men were being instructed. They were very pleased that finally some of the women were being helped.

Women are expected to be economically independent from their first marriage to the end of their lives. Women see themselves as the providers for their young children, as important contributors to the marriage payments of their sons, and as contributors to funeral expenses of deceased relatives. Add to that, the responsibility of clothing and supplying themselves with material or tools used to work with. All the above are powerful incentives to engage in some form of independent economic activity.

Marketing: Every woman in the village cultivates peanuts. Married women cultivate private plots of millet which they use in marketing activity. There are very few women who never market at all.

The degree to which a woman can engage in marketing is strongly affected by the age of her children and her position as a wife. Women with young children tend to ask older women or younger girls to sell their produce at the market.

An older woman is exempted from communal farm labour, and though she is older and less active she is able to devote more time to her personal fields and therefore to produce more. She can also count on the help of her children and grandchildren. A young wife can only count on the help of her husband, if he is willing.

A second or third wife's household duties are traditionally greater than the first wives.

Despite the restrictions of children, age or conjugal ties, women engage actively in economic activity that they consider essential for their security. The following are examples of the nature of women's economic activity.

R. is an older woman who has one married daughter residing in the village. She started actively engaging in marketing in 1970 when her children were grown. As a second wife, her duty is to prepare her husband's lunch every day, whereas the first wife is only expected to prepare dinner on alternate nights.

Each year she cultivates peanuts and may sell as many as 12 tins totalling a profit of as much as 6,000 CFA francs. Mer most active period is during the dry season from January to May. She sells at every single market and there are approximately 10 markets each month. During the rainy season she sells on three market days every month.

When she first started selling, she sold millet balls. These required at least a half days preparation. Now she sells tobacco, dried fish, seasonings, large clay pots made by men who commission her to sell and sometimes cola nuts. All the vegetable items require much preparation. She also makes and sells millet beer which takes at least three days to prepare. Her profits are small. She invests approximately 500 francs in addition to three days work in order to sell 1,300 CFA francs of dolo.

How she spends her money: Much of her produce is given to members of her husband's family and to members of her family. If she makes millet cakes and beer, she has to offer some to her relatives.

R. invests her money in goats and has three now. Last year she bought a bicycle so that her son could engage in business. R. spends about 150-200 francs each week on condiments used to prepare the sauce. She buys clothing for herself and for her children and expects to contribute to her sons marriage. This year she had to invest 1,800 CFA francs to purchase an iron pot.

P. is a young, unmarried woman fifteen years old. She grows peanuts and her first marketing activity started when her mother gave her fifty francs to buy millet to make millet cakes. Since she has relatives in Piela, she sometimes sells in the Piela market about 10 kilometers away.

She sells only millet cakes. When P. buys millet she never buys it from her immediate family because her father feels that there will not be enough millet to feed the family if everyone markets from the family granary. Some days she makes 150 CFA francs, and on other days, she makes 200. She is also expected to give some away to friends and relatives.

The millet flour is prepared in the traditional way. In addition, the cakes must be fried. For this P. uses karite butter processed by her mother. During the rainy season, she helps her mother gather and prepare karite nuts used to make the butter. This entitles her to part of the butter. P. uses her money to buy clothes and small trinkets. In addition she has a special friend with whom she exchanges gifts once a year.

The women's economic activity is characterized by small initial investments in business. Almost all of their produce requires time consuming preparation. Virtually all the elements utilized in the preparation of food are prepared by themselves. Some older women can afford to buy condiments on the market or may be able to afford wheat flour to make cakes. But generally, with the prices of processed food being very high, most women have to process all the ingredients themselves. Much time and effort is spent looking for water, searching for wood, pounding millet, making karite butter and seed oil. Their production is severely limited by these factors.

One of the items that women are most interested in having access to is a mill. Pounding and grinding may require up to four hours of a woman's day. Many women walk 20 kilometers in order to use the mill in the neighbouring village.

The mill in Piela is tremendously successful. However, it is powered by gasoline and grinding is rather expensive. It would be advisable to look into mills that could be powered by other sources of energy such as animal traction. Since Kouri has a high concentration of livestock, such a mill would be much less expensive and available to more women. The cost of fuel is very high in Upper Volta since all of it is imported.

Another important aspect of development is the incorporation of women into development programs involving new farming technology. I have already described the barrage at Dadiesma with all its advantages. No women work in the irrigated areas. Yet women have shown interest in new farming technology. Many women help their husbands with ploughing, and handle the ploughs themselves aided by a child.

It is extremely important that women be included in training programs for rural development. Women are active farmers traditionally, in addition they are recognized connoiseurs of the land and vegetation. As I have shown previously, expansion of economic opportunities for men while neglecting women, results in undermining their positions economically and forging them into dependent roles.

Educational opportunities for women are lacking everywhere in Upper Volta and particularly in this rural sector. I recommend that close attention be paid to the incorporation of women in development programs.

In summary, the form of aid requested is directly related to the current evolutionary direction of the society. They are aimed at creating a greater surplus of cereals, expanding the forms economic activity takes to include business investments, and incorporating women in the new economic structures.

Long range goals for invervention: Upper Volta has been recognized as one of the poorest countries in the world. It is lacking in certain principal elements necessary for success in the international economic arena.

Successfully competing countries must have the following elements in their economy: 1) control over internationally valued resources, 2) control over the means of production of manufactured goods, 3) capital; 4) abundant labour supply, and 5) markets.

Upper Volta is missing all but labour supply and markets. This means that as economic pressures are intensified, migration will increase, depriving the country of its most valuable resource.

Given the state of the voltaic economy, the wisest policy to adopt is to focus on making the country self-sufficient as possible, at least on the village level where most of the population resides. Villages have been traditionally self-sufficient, producing the necessary items for their subsistence for centuries. These elements of economic independence are gradually being undermined as more of the population participates in the relatively new economic order. Nonetheless, self-sufficiency can be restored and expanded to meet the growing demands of the population.

First on the priority list to be developed, should be alimentary self-sufficiency. Land erosion and consequently diminishing crop yields are perpetual problems. However, some development agencies, notably C.I.D.R., working in Gorom-Gorom have shown that yields can be doubled, or tripled, using selected and seeds from local varieties, donkey or oxen drawn ploughs depending on the type of earth, and some fertilizer. With minimum affordable investment, the peasants have not only progressively increased their yield for the past three years, they have also improved the quality of the soil. (Personal communication, bill Oxfam).

Village industries must be developed in order to meet the growing demands for certain types of tools and goods. Villagers have taken the initiative in many cases to provide themselves with modern manual tools like sewing machines, carding tools, etc., needed to increase production.

Aid, in the form of agricultural instruction and expertise, in quantities sufficient to reach all peasants, and to follow them closely; intermediate technology powered by energy sources available in the country, requiring minimum money investments; and two important elements to focus on in order to help build relatively self-sufficient village societies.

Village Profile: Kouri:

The village of Kouri officially has 644 inhabitants. In 1972, the canton of Piela in which Kouri is situated had a population of 18,000 and occupied over 952 square miles. The population density was about 20 inhabitants per square kilometer. Now 8% of the population was Peulh and 7% Mossi.

The latest census shows an increase of about 5,000 inhabitants in the canton of Piela. There has been a steady influx of Mossi merchants. In Piela they are the balcers, run local small, and own a small food grinding mill.

The Peulh chief has also reported a substantial increase in Peulh migrants to the area. Many of them have migrated from regions severely afflicted by the drought.

The Gourmantche sector of Mouri has also had an increase in population as a result of migration. At least two Mossi families have moved there permanently within the last two years. Many villagers from Piela with relatives in Kouri through marriage, matrilateral or patrilineal kinship ties have taken up residence in the village.

Season migrants, such as the Pella, migrate south during the dry season in search of straw used to manufacture mats and other objects. They board with Gourmantche families and perform various services in exchange for lodging.

Distribution and housing: Kouri is divided into six quarters. Five quarters are Gourma, the sixth Peulh. Some consider the Peulh sector a village in itself since it is the residence of the Peulh chief.

The Gourma sector has a total of about 60 compounds inhabited by members of the five major lineage segments residents found in the village. The two most populated sectors are situated in the eastern part of the village and populated by the two largest lineage segments.

Each compound consists of a cluster of houses built around a courtyard. The opening of the courtyard faces west. The walls of these circular houses are made of mud brick and the roofs are made of woven straw. It seems that mud brick houses are fairly new to the area. Twenty years ago many of the houses were made of secco (woven straw mats).

Compounds may vary in size from a one house courtyard to a nine or ten house courtyard. Each wife occupies their own house. Traditionally a married man spends the night in his wife's or wive's cottages, however, many men have private cottages.

Women, their unmarried daughters and young male children sleep in the same houses, while young men usually sleep in a house by themselves.

The compound is surrounded by a small area of land where corn, millet and some vegetables are grown. Tobacco, calebasses and certain fruit trees may be grown within the walls of the compound.

Social Organization:

Family Groups:

Residents are organized on the basis of membership to a patrilineal descent group. Membership to a patrilineage gives access to land to certain religious and political offices. Hence grave diggers belong to a certain lineage, blacksmiths are members of another, earth priest, and salt traders belong to others respectively.

The restricted extended family predominates. A compoundgenerally consists of two or three households headed by a father and his sons and brothers. Wives, sons and unmarried daughters as well as children of relatives residing in other areas may accompany them. The family usually includes three generations. However, this pattern is changing as young people opt to reside away from their elders. Compounds may vary in size from a family of four to an extended family of 45.

The family and the unit of production:

Extended family units do not always correspond to economic units. In the past those who lived together worked together. Sixty compounds would have corresponded to 60 units of production. Food production took place on land owned by the patrilineage and all fruits of collective farm work were controlled by the oldest member of the patrilineage.

Young men, their wives and children were responsible for the bulk of the farm work. At present a household comprising three family units may make up two or three work units rather than one. Out of 121 families interviewed, there are 102 units of production.

Marriage:

Marriages are generally arranged by heads of the family through the medium of bride service. A young man wishing to marry will perform various services for his future father in law as well as ply him with gifts regularly. In this region a young girl may be courted by several young men at once. The young man has no guarantee that his services or his gifts will result in marriages to his prospective fiancee. Factors such as the number of relatives his prospective fiancee has in his native village, or whether or not someone from his family has already married someone from hers may work heavily in his favor.

Aside from the personal services a young man performed, his family was responsible for providing the bride's family with nine cotton bands, a sheep if her father was dead, and two cowrie shells. This required the cooperation of many members of the father's and the mother's family. In the last 20 years, bride price is easier to furnish and only close members of the family need contribute.

In the past the rules of marriage were very strict. Members of the same lineage were strictly forbidden to marry. Villages were smaller and women as a rule married outside of their natal villages. Lately members of the same lineage may marry if their families have been residents of different villages for several generations. This ensures a lack of common ancestors in recent generations.

Polygamy is a fondly held ideal of both young and old men. Nonetheless, the norm is different and most households are monogamous. Of 127 households, 101 are monogamous, 19 are two wives households and 7 are three wives households. In many of the polygamous households, wives have been inherited from deceased brothers.

Marriage age has been greatly reduced in the last twenty years. In part, this is responsible for the decrease in polygamous households. Men in previous generations married at the age of 30 or 35, women at the age of 20. Currently young men may marry at 20 and some at 17. Young women marry at around fifteen to seventeen years of age.

The reason for this decline in age within such a relatively short period is difficult to assess. Oversimplified explanations stressing the greater availability of money lose sight of the complex social mechanisms

involved in marriages between members of exogamous clans. Clearly the decrease in marriage age is an indication that traditional social institutions are undergoing rapid changes. The lowering of marriage age is directly related to the decrease in size of households as well as the decrease in size of units of production.

Political structure (traditional):

The village chief is the basis of the traditional political structure. The chief of Kouri is officially designated by the chief of Piela within whose doman his village is located. The chief of Kouri holds the title of official chief to two other more recently established villages, Dopongou and Kodjiwa. These villages have administrative chiefs, but no traditionally recognized chiefdoms.

In each village political differenciation is based on the earliest lineage segment to settle the village. Each village is ruled by a different lineage. Only those members of the ruling lineage can hope to hold office in the particular village ruled by their lineage segment. In general the ruling lineage corresponds to the largest lineage segment in the village.

Traditional duties of the chiefs:

The chief is assisted by an unofficial village council. Together they make decisions that concern the welfare, or require the cooperation of the whole village. The chief and his elders preside over matters pertaining to the distribution of land to strangers arriving in the village. They also preside over disputes between lineages or unresolved disputes among members of the same lineage. He and his council are also responsible for officially setting the day of village festivities. Because of his authority over the land, he must be informed of all funeral arrangements. The chief also presides over the market. All those desiring a permanent spot in the village market must first talk to him.

Decisions made by the chief requiring communal labour are carried out by a group of young men between the ages of 20 and 30. The chief addresses himself to the head of the work group (djawa bari), who then carries out the orders of the council. The services they provide include building public housing for strangers, cultivating the chief's land other forms of public works.

The chief is entrusted with the welfare of the entire village. In times of general disaster such as drought, disease, wars, he is expected to make sacrifices at the appropriate altars. He is also responsible for the welfare of visiting strangers and is expected to house, feed, entertain, and provide them with gifts.

In exchange for his services, the chief could exact tribute at harvest time as well as from hunting and spoils from welfare. He is also entitled to the labour of the young men's and women's work group. Much of the tribute brought to the chief is redistributed to visiting strangers, during festivities and in times of famine.

Incorporation of the chief in the modern political structure:

The present chief of Kouri was elected in 1975. Since colonialism the chief role has been auxiliary to the government. He is expected to assist in the collection of taxes, and during colonial times organized the work forces needed for public works in the area.

Since colonialism, traditional chiefs have suffered a gradual loss of political power. Although they command the respect and allegiance of the villagers, the influence of national government is felt increasingly by the population. There are more government agents in these previously neglected areas. People who once payed no taxes are seeing the advantages of doing so, and regard their government as a source of support.

Division of Labour:

Social division of labour is based on sex and age. Sexual division of labour is extended to all forms of economic activity. Household duties, farming, the manufacture and sale of graft items, the right to hold certain offices are all based on status according to age and sex.

Household duties:

The women's most time consuming activity is the daily preparation of food. To do this, they must fetch water and search for wood. Once wood and water are in abundant supply women may then proceed to pound, van, wash, grind and repound the millet into flour, which is then cooked for several hours. Although food preparation is entirely a woman's job, men may assist in some food gathering activities such as climbing trees in order to gather the leaves used in the preparation of sauces.

Women are in charge of cleaning their own houses. Keeping the courtyard clean is an activity shared by all members of the family.

Child rearing is also shared by all members of the family. Clothes washing is an individual activity in Kouri. I have been told that in other villages women and children share the burden of washing.

Division of labour in farming activities:

Crops grown by each sex: Men and women farm communally, however certain crops are officially under the jurisdiction of each sex. Sorghum and millet are grown in large quantities by men. Older women and women whose children are weaned may grow millet in small quantities. Women who can no longer bear children may grow sorghum in small quantities. Peanuts are primarily a woman's crop. It has only been recently that young men have begun to produce it in large quantities. Garden products such as okra and pois de terre, calebasses, are also grown primarily by women. Sesame and beans are usually grown with sorghum and millet. Since women rarely grow large plots of cereals they grow smaller amounts of sesame and beans that can be grown in the large communal fields under the jurisdiction of the men. Indigo used for dyes, and liane used for rope making are also grown by men.

Family heads decide what is to be grown on the collective plots, however, decisions relative to cash crops or other individually grown crops are made by each individual. Generally the head of the household is asked to give spiritual advice by reading the sand. Mothers are asked for the technical advice as to what variety will grow best in the soil available.

Preparation and seeding of the soil: In late April and early May, fields are prepared for the coming farm season. Men are generally responsible for the preparation of the fields. In cases where a woman has no close male relatives, she may be forced to prepare her fields herself.

Field preparation consists of cutting down shrubs. These are allowed to dry and then are burned along with millet stalks left over from last season's harvest. After the first heavy rain, the soil is overturned in preparation for planting. Most private peanut fields are old millet fields. They are covered with a light growth at the beginning of the season and require a relatively light energy investment.

Sowing seed in the large communal fields requires the cooperation of the entire family. In individual fields each person sows for himself. Individual peanut fields are usually prepared by the men while women will sow the seeds in all the plots.

Harvesting: Because of the lack of surplus labour and labour saving devices, strict and efficient coordination of activities is required during the harvesting and planting season. A man who has taken too long to harvest his millet may find that his peanut field has regerminated. Each crop is harvested according to a definite schedule and as usual men and women share duties according to their sex.

Millet and sorghum: Millet is generally the first major crop to be harvested. At the height of the harvest, a woman's day differs somewhat from a man's. Men are responsible for cutting down the millet stalks. Because the sorghum grains are sensitive to dry heat and tend to fall off more readily during the middle of the day, men wake up as soon as the moon appears in order to chop down the millet stalks. The moon provides them with light. Later during the day the women will go to the fields, cut off the ears of millet, gather them in baskets, and bring them to the granaries where the men will arrange them in stacks.

Peanuts, corn, pois de terre: Corn is generally ready to be harvested before millet. It is not a major crop and therefore does not require much time. The ears of corn are harvested by men and women, and the men are responsible for cutting down the stalks.

Peanut harvesting follows a different pattern. Men are responsible for digging the plants out of the ground while women detach the seeds from the roots and gather them.

Pois de terre are harvested by women only, since it is grown in small quantities.

Appropriation of surplus labour among men related family groups: In addition to the family unit of production, peasants organize themselves in large groups for a days work in a particular person's fields. Work groups are organized for political and social reasons. The most frequent organization of work groups center around social events. A work group may be called among friends, simply for catching up with weeding, or for working in the fields of one's future father-in-law. The latter type of work group is for the purpose of bride service. There are

also special types of work groups organized by young women and are usually for an older woman. They may either weed or harvest peanut fields, or gather wood for the elderly woman. Some old women may get as many as two of these invitations per year.

Most people organize work groups at least once a year. Work groups are never organized during the planting season, because at this time all the surplus labour is needed to plant as quickly as possible in the family fields. Work groups are organized primarily around weeding and harvesting.

By far, the most important work group is the one organized for bride service. This is generally an elaborate affair involving as many as 50 persons and requiring the cooperation of family members, as well as friends residing in various villages. The atmosphere is festive. Food and drink are available in large quantities. Women are responsible for cooking and carrying water, while men do all the farm work. Invitations for harvesting are slightly different, in that women are required to cut the ears of millet from the stalk and gather them in baskets. Young men must organize several work groups to labour in the fields of his fiancee's patrilineage.

Participation in work groups:

There are several types of work groups. Work groups called by the chief and organized by the head of the young men's association, are compulsory and require the participation of all members of the group. Work groups called among friends and members of the family, are based on the principle of reciprocity. If a young man is present at the work groups organized by his friends, he can expect to be aided in the same manner when he extends a similar invitation. A young many may attend as many as three such invitations in one day.

The most important work group to attend, are those work groups rendering bride service. These call for the most reciprocity among young men or marriageable age. If a young man does not help enthusiastically, he is not going to be helped by his friends when he is fulfilling his obligations to his future family by marriage.

In a society where units of production are generally small family groups, work groups provide a means by which individual farmers may have access to surplus labour. These groups are particularly helpful to old men and old women, whose labour needs are greatest around weeding and harvesting time.

However, the cost of organizing a work group increases with each season. Once the cost of organizing an invitation was sustained by the extended family. Millet was provided by various households, milk was provided by the Fulani, Kola from others. Villagers state that these days, an invitation is a rather costly affair. Costs may vary between 3,000 and 5,000 CFA francs. The cost for work groups organized for bride service is even greater, because of the added expense of paying the musicians. Many farmers find that they can barely sustain the cost of organizing one. Some go into debt at this period, particularly if they are helping their sons to fulfill their obligation to a future father-in-law.

Dry season economic activity:

Farming requires the greatest degree of collective labour investment of all village activities. Dry season activity is more individual in nature and requires cooperation among smaller numbers of people. In traditional society, economic interaction implies precise social relations, reflected not only in production but in the distribution of the final product.

Sexual division of labour in the performance of dry season activities:

Housebuilding and roof mending are usually services performed among members of the family. Men are blacksmiths, jewelers, weavers, wood carvers, leather workers, butchers, calebasse carvers, mat makers and basket weavers.

Women spin cotton thread, make certain objects of pottery, fish with baskets, pound the earth from termite hills indispensable in the construction of houses, and process and prepare all forms of food. So great is the scope of this latter activity, that I have devoted an entire section to its description.

Food Processing and Preparation:

Food preparation is the most elaborate of women's activities, and requires the most time. It is not just a daily household duty, it is also the principal means by which women engage in independent economic activity. The following is a brief summary of women's food processing activities according to the various foods.

Sorghum and millet:

Aside from their use in the daily diet, millet is prepared and presented as: millet balls (floured and sugared), and millet cakes cooked in oil and sold on the

market. There are any number of gourmet items which include millet flour. Processing of millet in order to convert it to flour as well as cooking it, may take as much as half a day. Dolo, millet beer, an important beverage at all festive occasions, is also prepared from millet. It may also be prepared from other fruits. It can take up to three days to prepare dolo.

Peanuts:

Peanut oil, peanut butter and zumbala are the main products made from peanuts. It takes a woman an entire day to make a quart of peanut oil from 9 kilos of peanuts. The residue is rolled into little balls which are added to the sauce eaten with millet cakes.

Sesame:

Sesame oil, sweet cakes and sauces are the main products.

Beans:

Beans are used in sauces and to make several varieties of bean cakes which are sold on the market. The leaves are mixed with flour, highly seasoned, and sold on the market. They may also be added to sauces.

Neere:

Eaten as a fruit. Powder covering seed is mixed with millet flour to give it a sweet taste. The seed itself is used to make Zumbala. In order to do this, the seed must be boiled, the skin removed and sticky leaves added for cohesion. These are rolled up in balls or triangles and sold on the market and are widely used to add flavour to sauces. Zumbala may also be made from soja, peanut and boabob seeds.

Tamarind:

Tamarind seeds and leaves are an important ingredient in drinks and sauces. It is also used in the preparation of saabou.

Dolo:

The fruit of raisinier, as well as millet is used to make dolo. Preparation is lengthy and may take up to three days.

Karite:

Once the fruit is eaten, the seed is used to make karite butter. This requires an elaborate process lasting three days. The butter is used in the preparation of foods.

Smoking and drying:

All meats, fowl, fish and some vegetables are smoked and dried in order to prolonge conservation.

Reciprocity in social relations of production:

Virtually all forms of productive labour requires a certain degree of reciprocity, particularly between the sexes. The following is a list of certain productive activities and a description of the manner in which labour, at various stages of production, is shared.

Tobacco processing: Tobacco is usually grown by men. After the harvest, if it is not sold, it is given to an older woman who pounds it and sells it on the market in powdered form. Women whose male relatives have not grown tobacco, may buy it before processing it. Before money became the only medium of exchange, a woman may have exchanged a certain amount of process tobacco for crude tobacco.

Cotton processing: Cotton is usually grown by young men. Once harvested, it is given to female relatives who convert it to thread. The thread is then given to a weaver. If the weaver was a relative, she was not obliged to pay him. If he was not a relative, she would leave him a certain percentage of the thread in exchange for his services. Young men, the principal cotton growers, would generally give cotton to their mothers to thread, knowing that in so doing they were helping to provide for bride price. Lately, however, much of the cotton produce is sold at the village market.

Pottery making, basket weaving, mat weaving, and calebassas:

Women make various domestic items from clay and mud, including molds used to fry millet cakes, chairs and granaries. Chairs and granaries are made from mud bricks. The materials may be supplied entirely by the woman or with the help of her friends. Clay, however, is different; only men may supply women with clay. When men use the clay to make large earthenware pots known as canaris, they usually give them to women to sell them on the market. The same is true for secco, large straw mats, and baskets.

Reciprocity in social relations of production may be found at all levels of economic activity. All members of the society have a role in production, and all members stand to gain from the items produced.

Conclusions:

I have shown that response to the drought has stimulated the economy in the following ways; 1) improved transportation and road conditions opening up many inaccessible rural areas, to participate more fully in the national economy; 2) provided needed jobs in drought afflicted regions by hiring local labour to work on drought related project; 3) raised the general level of consumption even in remote rural areas; 4) stimulated the diversification of the economy by providing alternatives outside of the traditional economic system.

Although all these appear to be positive factors they must be examined in light of their long range effects. The amelioration of the transportation systems has brought more merchants in contact with previously inaccessible areas. The plethora of buyers has stimulated the peasant to increase his production of farm products. However, profits from the sale of farm goods are barely enough to meet their needs. In addition sale to private merchants fosters a dependence on a credit system that places them in debt and forces them to sell their goods at half their price. In addition, peasants do not have the technological means to expand their production without increasing their labour force and the size of their fields.

New sources of income were welcomed by the communities. However, the types of jobs furnished by drought related projects are not self-perpetuating. What will become of barrage builders, well diggers, and other labourers once these projects are terminated?

Newly established economic alternatives are more readily available to young men than to any other segment of the population. This fosters inequality of access to wealth, thus fostering economic dependence of women on men. In addition, participation in new forms of economic activity fosters the breakdown of many positive social relations of production between members of the village community, consequently altering social relations between members of the society. The peasant has less access to communal labour, is not as free to participate in reciprocal relations of production and must therefore pay for services which he could once depend on friends and relatives to provide. At the same time that these protective institutions are being dissolved, new economic relations offer few protective structures to replace the old ones.

Pumping money into the economy without providing the means to perpetuate the prosperity, i.e. the means of production, expanded market, etc., raises the level of consumption for a while. However, this state of prosperity is bound to be followed by inflation and subsequent depression.

I have also shown how integration into the money economy fosters dependency of the village community on the larger economic community. The villagers are obliged to sell their labour and produce in order to procure the cash to purchase manufactured goods. Increase in the use of certain types of manufactured goods, stunts production of the same types of goods within the village. Thus villagers increasingly depend on the larger economic community to satisfy their material needs.

Loans for business investments:

There is a great incentive among all members of society to branch out into forms of business activity other than farming. The reasons given for engaging in independent business ventures vary. Many young men mentioned that farming does not afford enough economic security. In addition farm products get extremely low prices on the market. They also mentioned that dry goods such as mobylette parts, etc., can be stored indefinitely while farm products have to be used in a relatively short time. It is clear that the sale of farm products cannot satisfy the peasants' money needs. Most of the peasants are constantly in debt and are forced to sell their crops before they ripen in order to make ends meet. Young men are particularly interested in the sale of manufactured goods and in "restauranteering".

The first businessman opened shop about six years ago. In the last five years the number of businessmen has increased steadily. There are now six businessmen in the village. Almost all the young men that I interviewed, have as their goal a private business. Many speak of going to Abidjan and Niamey in order to earn the capital necessary to invest in business. The following is a description of the business activities of two villages engaged in two different types of business.

The Restauranteer:

The restauranteer worker in Ghana for a few years in order to earn the capital necessary to launch himself in business. His first business attempt failed when he returned to find that, because of the drought, his family's grain reserves were depleted. Most of his money had to be used to purchase grain. He went back to Ghana accumulated a little more capital, and returned to the village. After a year's cultivation, he was able to amass the capital necessary to open his first restaurant.

When asked why he had chosen restauranting he replied that he had chosen it because it required a small initial investment. This is in fact true. Every dry season, for the past three years, he constructs a shelter from wood and secco (staw mats). The total construction investment is about 1.5 CFA francs which includes the price of the food with which he feeds his friends who help him with the building.

In addition to the building he buys a few large clay jars in which he cooks and stores water. He pays a total of about 1.1 CFA francs. Water, kitchen help and wood cost about 600 CFA francs per day. The price of rice varies greatly during the season. Last season it varied from 600 CFA francs a tin to 2.2. The sauce which he adds to the rice may cost him as much as 900 francs per day for all ingredients. Initial cost of establishing such a business does not exceed 5 CFA francs. Since he began, three years ago, his business has expanded. Originally he sold a kilo of rice per market day. Now he sells around 5 kilos per day. After calculating all his expenses, total profits from the dry season varied from 11 to 27 CFA francs. On a very active day he may serve as many as 60 people. Most of the people come from other villages or are workers on well building projects in the area. He has mentioned that the increase in population has been profitable for him.

The storekeeper:

This storekeeper is the first to have opened shop in Kouri. He opened his business in the winter of 1972. In 1972 he earned 7,500 CFA francs from the sale of peanuts. His father and his mother gave him some extra funds in order to start business. He invested a total of about 10,000 CFA francs in his first business venture. On his first business trip he bought 10 kilos of sugar, 11 pairs of plastic shoes, 24 cloth lengths known as pagnes and 18 head scarfs. Taking advantage of the fact that it was in the height of the festivities he was able to sell all his goods in 9 days. People buy much more during the dry season especially right after the harvest. Funeral obligations particularly require much gift giving. In 1972 he went to Pytenga from whence he bought goods every nine days, during the dry season. During the rainy season he goes once every two months.

He is present at neighbouring villages every market day. During the long festivities of the dry season he also sold at night. He travelled by bicycle to Puytenga, at the time the Sirba bridge could be crossed by bicycle.

In 1973 the severe drought lowered his money reserves as he had to buy millet. His investment capacity diminished. Coupled with the rise in cost of products he suffered a financial set back. In the past years he has managed to expand his business to include the sale of beer and mobylette fuel. Private merchants who buy produce regularly in the village will transport about 50 gallons of fuel for 1,000 CFA francs. Transportation costs are very high. Once the small businessman starts to expand his business and buy in bulk that he can no longer transport in the back of a bicycle or a mobylette his business expenses are even higher and his margin of profit lessens. This storekeeper is considered the most successful businessman in the village. He earns from 50,000 to 85 CFA francs per year ($200 to $380).

Despite the growing interest in businessmen investments, I feel that certain forms of business are more favourable to the development of the village than others. Although it may seem that the growing use of manufactured goods as well as the growing facility of transport would make shopkeeping a profitable venture, there are many disadvantages to investing in manufactured goods. One of the most striking factors in evaluating the investments in manufactured goods is the increase in price of the goods from year to year. The purchasing and investment ability of the peasants recedes at a great rate each year. It may be argued that price inflation may be a good reason to invest in dry goods, however the peasant usually has small amounts of cash on hand not enough to make investments profitable. In 1972, the storekeeper bought sugar at 75 CFA francs a kilo, shoes at 250 CFA francs a pair, cloth at 400 a length and head kerchiefs at 150 each. In 1973, the price of sugar increased to 100 CFA francs per kilo. Shoes cost 350 a pair, cloth 400 CFA francs and scarves 175 CFA francs. Prices went up 25% in one year. His purchasing power diminished considerably, not to speak of his operation costs. In addition he is forced to buy more millet than other families as the time spent in the pursuit of business activity takes away from his agricultural production. Since 1975 he has hired farm help for a few days each rainy season, because of his frequent absences at this time of the year.

Increased consumption of manufactured goods has other negative consequences in the village. It is often the cause of decline of production of similar types of goods within the village. I have previously mentioned the decline of weaving and dyeing in the village. Consequently, villagers no longer have equal access to both types of goods. They are increasingly dependent on manufactured goods and therefore on the process of earning money in order to buy these goods.

Increased purchase of manufactured foods contribute to the depletion of the monetary resources within the village. Most of the money made by the villagers goes out of the community in the form of taxes, and consumption of imported manufactured goods. This fosters an unfavourable balance of trade between the village community and the large commercial centers. Very little money comes into the village but much of it goes out.

Of the two business activities mentioned, the restauranteer's business is a more desirable form of enterprise than the storekeepers. The restauranteer avails himself of products produced within the village, i.e. clay pots, rice, seccos, etc. He hires village personal thus encouraging the circulation of money within the village community. In addition he helps bring money to the village by selling to strangers who have come to the village on market day. In this way money flows in rather than out.

The interest in the development of small businesses should be encouraged. However, one should be mindfull of the pitfalls as delineated above. I believe that in order to create a favourable balance of trade between the village community and the outside commercial sectors it is necessary to develop traditional industries as much as possible and to try to encourage the villagers to sell their products on the markets outside of the village circuit as well.

Industries such as weaving should be encouraged. Villagers do admit that although manufactured cloth offers a greater variety of patterns, is attractive and more readily available than cloth woven in the village, they realize that the quality of village woven cloth is better. Pagnes woven in the village last longer. In addition the art of sewing is highly developed in the area. There is at least one tailor in the village. Weaving technology could be improved by the introduction of slightly more elaborate and more efficient weaving machines. In addition weaving could be stimulated if weavers could be assured of a more expanded market, as well as an increase in the supply

of cotton. The same could be said for other industries such as leather working and blacksmithing. Villagers are responsive to such efforts to organize and develop internal production. Last year FDH was able to organize the forging of over seventy ploughs by traditional blacksmiths. The villagers quickly perceived the advantages particularly in the price range of the items. All of these ploughs were bought by villagers.

Mobilization of traditional village industries to meet increasing demand and to reach markets outside of the villages requires expertise not inherent in the traditional distribution circuit. Money should be budgeted to provide this type of expertise to the villagers. Management, purchase of the means of production, and transportation to other markets.

CHAPTER SIX

FIELD PROFILE: NIGER*

Geography and Climate

Niger is an inland African country. It is more than 500 miles east of the Atlantic Ocean with a total land area of 490,000 square miles.

The semi-arid climate in the south and the desert climate of the north account for the great variety of land scape, and for the uneven distribution of the population. The most populated and productive zone stretches from Lake Chad to Niamey. It is in this zone that the primary cash crop of peanuts, as well as the cereal food crops are cultivated. The monotonous scrub growth of the steppes is broken here and there by large cultivated patches, which are green or yellow, depending on whether it is the rainy or the dry season. Most of the inhabitants of the country live in this zone.

The countryside and the people change as one approaches the Sahara desert. Trees become smaller, the cultivated patches disappear and are replaced by noma dc herders and their herds. These herders are transhumant, moving their herds from north to south during the dry season, and from south to north during the rainy season.

Farther north, apart from the Air Massif, where there is a certain amount of sedentary farming -- the shifting sands of the desert make both human and animal life impossible.

The Tanout Zone: Rainfall and Climate

The Tanout zone in the Zinder region of Niger consists of farming, herding, and desert areas.

Rainfall in the Tanout zone or district, as in the rest of Niger, is characterized by a wide variability in quantity and geographical location, as well as in time and space. The following table provides an indication of that variability:

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*The field researcher in Niger just returned from the field in September 1977. His report is not yet complete; which is why the Niger section is small.

Year		1972	1973	1974	1975	1976	1977
Place							
Tanout	mm	146.7	207.8	301.2	203.2	219.5	237
	days	16	14	29	16	24	15
Bakin	mm	-	205	376	253.9	257.1	341.5
Birgi	days	-	17	30	-	34	20
Belbedji	mm	193.4	149.1	231.2	187.6	222.5	367.5
	days	-	11	23	24	24	16
Tahoua	mm	267.1	244.9	421.2	421.2	394.6	-
	days	36	37	45	45	58	
Agades	mm	73.9	75.9	137.2	130.9	106.6	
	days	23	13	23	27	29	

The district of Tanout is located between the latitude of 14 and 16 degrees north. It has a total surface area of approximately 33,950 square kilometers, which are divided into three fairly distinct ecological zones. They are presented in the table below:

Zone	Surface	Inhabitants	Inhabitants/km2
Agricultural	14,190	113,000	8
Pastorale	17,500	31,000	1.8
Desert	2,260	-	-
TOTAL	33,950	144,000	4.2

Ethnographic Configuration

The district had an approximate population of 100,000 sedentary farmers and 35,000 nomadic herders. These populations live in the following four townships:

(1) Tanout, which comprises 156 villages;

(2) Gangara, which comprises 110 villages;

(3) Tarka, which comprises 90 villages; and

(4) Olelewa, which comprises 76 villages.

This is a total of 432 villages.

The nomadic herders are dived in the following manner:

(1) Peul or Fulani, which comprises 96 clans; and

(2) Touareg, which comprises 56 clans.

Social and Economic Analysis

Livestock, which became an important economic issue during the drought, were concentrated in the north. Herders transhumed to the south during the dry season and went back to the north during the rainy season.

During the drought, the pasture and grazing problem became acute. Herders migrated to the north, but increasing numbers were going to the south and the west, where water and pasture could still be found. Because of the drought, another migration pattern took some herders up to Nigeria and Cameroon.

In the realm of agriculture, the cultivation of fertile lands was brought to a maximum. Cultivation of fertile lands increased after the arrival of refugees in the camp of Kara-Kara.

It became more and more difficult to find new arable lands. The trend was toward more extensive agriculture. The problem of the exhaustion of the soil became even more apparent.

Cash crop cultivation were reduced and "marginal" lands were brought under cultivation. There was movement into lands precariously close to the desert fringe, thus increasing the risk of crop loss due to erratic climatic variations.

Strategies of Adaptation and Change

During the early stages of the drought, the sale of animals proved to be a very important strategy. The data suggests that it was a very widely practiced strategy.

One of the advantages of keeping a sedentary herd is that it is an insurance mechanism; an animal can be sold in times of shortage instead of selling millet.

However, after the first crop failure, livestock fodder and feed of any king became so scarce that farmers were forced to sell off their herds at extremely low market prices, or watch them die off.

Sales of animals no longer yielded to the owners any great amount of money. Overall losses of animals in the research villages appeared to have been quite high.

Another adaptive strategy was the communal solidarity or institutions of entr'aide (mutual self-help). The one instance of entr'aide that was encountered was the gaya. The gaya is a Hausa institution, signifying collective farmwork performed for cash remuneration at lower than the prevailing wage rate. The size of the work party can vary considerably. The range was from 3 people to over 60. The average is usually between 8 and 15 people. Formerly common, the gaya nowadays is becoming less popular. It is increasingly replaced by paid labor.

In Gourbobo household heads were asked about the number and size of gayas which they had organized since 1970. The results indicated that there were few gaya during the worst of the drought years (1972 and 1973), with an increase in the 1974 agricultural season.

It seemed premature to draw any conclusions concerning the village gaya. The gaya may well be a very particular case. It was not that villagers were less cooperative during the worst years of the drought; it's just that the particular requirements of the gaya were not met. In other words, there must be an adequate amount of work in the fields to make calling a gaya worthwhile.

It must be pointed out, however, that the gaya does represent a basic institutional structure that is indigenous to the society, which could serve as a foundation or building block in the implementation of any project. Its existence should not be ignored as a collective unit, capable of being mobilized for a production activity.

There appears to have been an increase in the outright sale of farmland during the drought as a source of income. The incidence was low, but the fact that this was occuring at all was indicative of the crucial need for cash to meet personal and domestic expenditures.

The system of pledging the land against cash was becoming widespread. This type of pledge became, effectively, a sale if the pledgee was unable to repay the cash pledged against the land. What this meant was that the land was lost to the owner.

What seemed clear from each adaptive strategy which emerged among farmers and herders was that the larger issue was the need for cash: very liquid cash.

Recovery projects must take this into consideration, as well as the need to provide support to farmers and herders as they move into new areas of production behavior.

CHAPTER SEVEN

CONCLUSIONS

The data from the four research sites suggested a number of similarities and parallels among farmers and herders in Senegal, Niger, and Upper Volta.

First of all, it seemed clear that the drought exacerbated an existing problem of annual food shortage, especially of the staple cereals cultivated in Sahelian zones.

Food Production

Millet and sorghum are the principal cereal crops comprising the food production system. The data indicated that although farmers and, to a lesser degree, herders, are dependent on cereal production to satisfy food needs; the food production system has not received the same attention as has the cash production system in the following areas:

(1) technology -- Though some of the light machinery and hand tools designed for use in the peanut farming system can be used in millet cultivation, equipment such as the "souleveuse" was designed for use in peanut production. More attention has been devoted to technology for the peanut production system, than for the millet production system.

(2) marketing system -- Peanuts are the primary export crop for most of the Sahelian countries. The commercialization, distribution, and marketing of this crop is clearly defined with sets of interlocking government agencies, that were created to facilitate movement from the farmer's fields to the final marketplace.

As of yet, millet has no stable producer price or commercial and distribution network. The price fluctuates over the year according to the supply and demand of the buyer.

(3) general attitude/purpose for cultivation -- The general attitude among farmers is that millet does not have the same importance as do peanuts. After all, it is peanuts which will provide the annual income. Millet is, therefore, not given the same attention in terms of field preparation, weeding, etc., as are peanuts. This means that the yields are much lower than they could be.

Water Resources

The fragility of the Sahel zone, in terms of its precarious climatic configuration, exposes farming and livestock raising to risks of life and death proportions.

Farming, for the most part, is rain-fed cultivation. The availability of water for the survival of human, plant, and animal life is dependent on the annual rainfall normal to each ecological zone in the Sahel. Any protracted departure from this normal pattern of rainfall, means disaster to the farmer and the herder.

The data indicated the need for a less hazardous source of water than annual rainfall. A secure source of water for Sahelian populations would be a beginning step in anchoring many of these groups.

The issue of water for Sahelian populations and their animals is, by far, the most important development issue before each of the Sahel governments. It goes, ultimately, to the heart of the larger global question of energy -- how to harness it and conserve it.

Solutions to this problem must first come from within, rather than from without. In other words, the first place to look, in terms of harnessing and conserving water, should be the residential areas of farmers themselves.

Ms. Ware reported seeing a system of conserving rain water in one of her research villages. The system was quite rudimentary in its technology. Each compound in the village had a type of open funnel, which channeled rain water from the roof of a hut, to an open tin container. It was not possible at that time to obtain any figures on the number of gallons harnessed from the rain and conserved in this manner. Some gallons were lost due to evaporation.

As a farmer initiated strategy which utilizes indigenous technology and resources, it seems worth further exploration. It is self-duplicating and can sustain itself without large external inputs, i.e. machinery, technicians, oil fuel, paper work (requesting, reporting, etc.).

This is not to ignore the need for hydraulic experts and hydraulic infrastructure on a larger scale in Senegal. However, both of these inputs in the development process, cost an amount of money which Senegal and other Sahelian countries are not able to commit.

Hydraulic infrastructure in Senegal, for example, has consisted, in part, of the construction of bore-wells or "forages" in several places of different regions. One of the major problems with the bore-wells, has been serious maintenance difficulties and continuity in the operation of the pumps. This has been due to lack of the fuel (gas-oil) used in the engines; missing or broken engine parts; absence of mechanical advice or a mechanic; lack of general care, maintenance; and attention to the equipment.

This is a problem which could be overcome by enough serious committment and involvement of the local people in the responsibility of having more bore-wells at their disposal. It is also a question of identifying the most capable and effective rural development service, which would translate a potential bore-well project into an integral and ongoing part of normal rural life.

Another problem within the hydraulic issue seems to stem from attitudes on the part of some donor missions, in Sahel countries, that manually powered wells are more appropriate technologically than engine powered bore-wells.

One crucial issue seems to stem from attitudes on the part of some donor missions, in Sahel countries, that manually powered wells are a more appropriate technology than engine powered bore-wells.

One crucial issue with donor financing of manually powered wells, is the ultimate uselessness of these wells in the face of another drought. The water table would again lower significantly, thus resulting in the impossibility for humans to draw water from these wells.

If we take the Diourbel region as an example, it can be partially illustrated that bore-wells and not manually powered wells, go to the heart of the development of water resources for that region.

Since 1977, the 1,133 villages of this region have been grouped into rural communities. There are 33 of these rural communities. One bore-well per rural community is ultimately less expensive, than sinking 1,133 wells in each village. Each rural community has its own council, which is responsible both to the villagers (comprising the community) and to the district head (sous prefect). The maintenance and upkeep of the bore-well would be the responsibility of these villages under the guidance of their councils.

The problem of water in the villages across the Sahel will not and cannot be solved by continuing to commit funds to sinking wells. Accessibility to water in these wells is dependent on a water table which is, in turn dependent on annual rainfall. If the citizens of a rural community want to sink a well, that should be their prerogative; and paid for out of their collective funds.

The larger issue of a secure water source is a national development issue. Its resolution should be explored first from within, and then with the aid of external advice and support. This fact is often lost on experts from highly industrialized countries, who sometimes think in grandiose terms, thus resulting in schemes that are too costly and not applicable to the situation.

Cash Crop Production

One of the plants found suitable for cultivation in the Sahel has been the peanut. Under the colonial system, it became an export crop grown by small farmers. It has become their basic annual source of income.

Farmers in Senegal, Niger, and Upper Volta grow peanuts in order to realize any substantial source of cash. This income is used to coverr most domestic and personal expenses.

If the rains fail, so do the peanut crops. This means economic disaster for the small farmer. The farmer is totally dependent on peanuts for his livelihood. Given the precariousness of the Sahelian ecology, some serious development thinking must be devoted to ways of diversifying the farmer's avenues for earning a living. Lessening dependence on peanut cultivation seems imperative.

The data strongly suggested irrigated perimeters and livestock fattening, which were innovations from the two research sites in Senegal, as potential ways of diversifying the farmers' production activities. They both have the potential for replicability in Upper Volta and Niger.

Extension Services

For each research site, especially the two in Senegal and the site in Upper Volta, extension services to

farmers have been as much a hindrance to small farmer independence as a help.

The data documented numerous cases of the lack of accountability by extension agencies to the small farmer. There were cases of the non-delivery of seeds, tools, equipment; of non-evacuation of crops (extremely serious in the case of tomatoes, which are perishable); and of non-payment of rebates; poor bookkeeping, etc.

The farmer was often outraged that he was pretty much locked into committing himself to participating in the system of extension services. None of these agencies owed any accountability to the farmer; yet, the farmer was expected to pay seed debts and equipment installment debts on time.

The extension services were generally characterized by a lack of adequate and properly trained personnel, as well as a lack of sufficient and properly maintained vehicles and equipment. These problems affected delivery schedules.

The above issues relate to logistical problems. More important than the logistical issue, is the issue of the structural legacy from the colonial period for rural agencies throughout the Sahel. They do not, in their present form, contribute to the ultimate autonomy of farmers concerning control over their production, marketing, and distribution. The efforts and activities of these agencies is often counterproductive to those of farmers. This is illustrated in the Waldstein report concerning SAED in the Senegal Delta region.

Dry Season Income-Generating Activities

Dry season income-generating activities among farmers and herders in each research site highlighted the crucial need for cash among these populations. Inflation has reached even into the most remote village. The farmer's cash crop does not bring in enough annual income to meet all his expenses. The cereal food crop harvest is generally not large enough to tide him and his family over from one harvest to the next. This means that he is obliged to purchase millet. This intensifies his need for cash.

The search for income-generating activities during the dry season is not a new phenomenon among Sahelian farmers and herders. The type and nature of these activities is almost the same in Senegal, Niger, and Upper Volta.

There is petty street trade in small consumer items, such as pocket calculators, radios, sunglasses, watches, etc.; small livestock trade; daily wage labor on construction sites, etc.

During the drought, when crops failed, these activities were intensified in time and space. Compound heads, and especially young adult males, were away from the villages on either a permanent or extended period of time. This placed added stress on the agricultural systems, by reducing the manpower available to effectively perform necessary preparatory tasks.

Migration

The drought seems to have set in motion, an increased irreversible trend away from the villages to commercial centers and towns. For males in search of some means to meet the survival needs of their families, the key to survival was not in the village. Increasingly, the commitment seems to be toward activities which yield an almost immediate cash benefit. Farming remains a rainy season activity, but nothing more. The Senegal research sites reveal instances in which entire compounds families reside in the villages only during the rainy season, in order to plant, weed, and harvest.

The problem for agencies such as SODEVA is "how are you going to keep them down on the farm?".

Findings and Feasibility Studies

The data suggests that a number of innovative strategies devised by farmers and herders in the research sites have the potential for setting in motion, a chain of events which could bring about real change.

It is recommended that a feasibility study be conducted in Senegal to further identify in detail and "flesh out": (1) the live-stock fattening innovation which has, again, been harnessed to the development strategy of SODEVA; (2) the water conservation innovation in the village of Darou Karim of the Diourbel region, and (3) the irrigated perimeter innovation which has gained increasing popularity among farming populations in the Delat region. It may be possible to harness this activity to the larger irrigated agriculture projects of interest to AID in the Delta region.

CHAPTER EIGHT

THE SAHEL : AN OVERVIEW

The focus of the field research conducted in three Sahel countries (Senegal, Niger, and Upper Volta), by four research teams of two people each (one American researcher and one African counterpart), was the identification of innovative strategies devised by farmers and herders in those countries as a means of drought survival.

The ultimate focus of this field research was to address the problems of rehabilitation and development in the Sahel, based on the findings and recommendations of the research.

The problem of developing this area, or of making it viable, is so difficult that many Western policy planners and social scientists greet the report of each new project failure with the acronym: "WAWA" (West Africa Wins Again!). Implicit or explicit in this symbol is the notion or fear, that nothing can induce the people in this region to change their "Hidebound" traditions, or that the area really can not be developed under contemporary conditions.

The following has been taken from "The New International Economic Order and the World's Poor Villages with Special Reference to the Sahel", Elliott P. Skinner, 1978.

I. The Sahel as an Ecosystem

The Sahel, like other regions of the world, has an ecosystem -- a dynamic interrelationship between the human societal subsystem, the plant and animal (biota) subsystem, and the natural environment subsystem. Under normal or ordinary circumstances, an ecosystem adapts or adjusts to small changes or perturbations within its component parts or subsystems. If an when subsystems change, the nature of their linkages or relationships to each other within the total ecosystem are modified. For example, if the population of a society in an ecosystem increases, the changes in the other subsystems may involve a greater use of the biota for food, and/or a more wider distribution of the population over the landscape. More severe changes within any subsystem may generate not only modifications in the linkages between subsystems, but also total changes within the other subsystems. If there is a drought or famine in a certain ecosystem, its

human population may migrate to other areas, or develop social and ideological mechanisms to compensate for scarcer food resources and generally, rectify the imbalance and ensure the ecosystem a chance of survival. In other words, ecosystems tend to exhibit an equilibrium of sorts, but one that does not prevent the total ecosystem from changing over time.

Natural and social disasters often reveal (that is, if the ecosystem is not immediately destroyed) the interconnections of various components of an ecosystem and which components are most viable or most vulnerable. Hopefully, natural social disasters also illuminate how the ecosystem could be changed if it is to survive. For example, it is well known that societies are the most complex subsystems, since they possess social groups organized in different ways and holding different values. Under normal conditions, the links between these different social groups are either congruent with or do not jeopardize the links between the societal subsystem and the other subsystems. However, when the entire ecosystem is in danger, the links within the social groups in the societal subsystems become tenuous.

II. Sahel Environmental Subsystem

The Sahel ecosystem of West Africa is experiencing such great difficulty that some say that it has reached a point of imminent breakdown. In order to understand why this is so, and what, if anything can be done about it, it is imperative to identify the factors that have led to this condition.

The Sahel's environmental subsystem is fragile. Most of this 200,000 square mile area is a plateau 500 to 1000 feet above sea-level, lying between 12 and 20 degrees north latitude and between 25 east and 18 west longitude. The temperature in this area ranges from 69 degrees Farenheit in January to about 90 degrees Farenheit in May. The Sahel receives 5 to 30 inches of rainfall per year, but even the rain in the 30 inch zone is concentrated in three to five months. It is therefore, not as useful as it would have been had it been spread over many more months of the year. Some of the rain water finds its way to a water table of variable depth, while the rest that does not evaporate flows into the rivers and water systems of the area. These include the Niger river, the Senegal river, the Volta rivers and the Lake Chad system. As none of these water systems were developed by the French as irrigation systems, they did not make a contribution to the local economies. The area's vegetation consists primarily of grasses, or chard bush and thorn plants.

However, as one approaches the Sahara, all vegetation disappears. The Sahelian soils are potentially rich, but the primarily chestnut and light soils of the area are often lateritic and generally poor.(1)

III. The Sahel and History

The history of the Sahel ecosystem is responsible for many of the contemporary biological, physical and socio-cultural challenges. Moreover, it is necessary to point out that this ecosystem has frequently been affected by the action of nature and of man. For example, during the Pluvial and Arid periods of early Sahelian history, the region's vegetation frequently changed from lush, tropical forests to sterile deserts with a corresponding change in the animal and plant populations. The last major change took place while humans (then hunters, fishers and gatherers) inhabited the region; lithic kits along the now sandy valleys and bone-dry wadis are evidence of an ecosystem that no longer exists. As the Sahara dried up and humans moved south, hunting and gathering as the basic food producing activities in the region changed. The people in the Niger River Bend faced the problem of adapting to an environment that was becoming increasingly drier. They abandoned hunting and gathering, ennobled the indigenous millets and sorghums which became the basis of their agriculture, and acquired cattle and other livestock from the east which became the basis for their ways of life.(2)

By 300 A.D., the ecosystem of the Western Sahel had become quite complex. The proto-Tuareg populations had already developed camel pastoralism and freebooting as a way of life in the most northern part of the area. Further south, the pastoralists with their cattle moved in transhumance cycles between the edge of the forest zone and the Sahara, often attempting to invade ecological niches occupied by more numerous agricultural peoples. The latter, more sedentary with a more productive economic base, were able to create more complex socio-cultural systems. Some developed state structures and used their military organization to incorporate weaker agricultural peoples, and to structure relations with the mobil pastoralists and fishing populations in the Niger River complex. The development of trade and commerce within the Western Sahel not only linked the various societies, but enabled the people of the region to establish trading relations with the Mediterranean region, with Egypt, and with the peoples of the forest zone.

IV. Agriculture

The social institutions of the populations in the region reflect the long and complicated history of the area. Those agricultural groups such as the Bella and Aser who still reside in the oases on the Sahara, may well represent the survisors of an earlier and widespread agricultural horizon, which disappeared with the onset of the Arid period that still perists. Whether those agriculturalists who are now found mainly in the Sahel and Sudan area migrated there, or were there before that aridity set in is unknown. But some of these populations were incorporated in the kingdoms and empires that appeared throughout the history of this region. This incorporation was possible because these agricultural peoples did produce enough of an economic surplus, which, with the addition of trade and commerce, could support complex societies.

V. Pastoralism

The settlement patterns of Sahelian pastoralists such as the Fulani (Peuls), Maures (Moors), Arabs, Teda and Tuaregs represent the end result of warriors and nomads adapting to a rather difficult environment.(3) Sahelian pastoralism requires a high degree of social segmentation and a mobile community organization capable of permitting people to exploit available pasture lands, water resources, and small oases. Traditionally, most of these populations have been migratory or have practiced transhumance, but a sizeable number have become sedentary,

VI European Contact and Conquest of Sahelian Peoples

Although in contact with Europeans since 14441, and participating in the slave trade and other types of commerce sicne the end of the fifteenth century, the Sahelians were not the subject of sustained European contact until the middle of the seventeenth century. In 1659, the French established a trading post at N'Dar, which they rechristened Saint Louis, and fought both the Dutch and the British for control of the important slave-trading port at Goree.

The increased trade drew the Sahel into an emerging network of European colonial ecosystems,but ony as a peripheral provider of manpower, as a supplier of raw material, for export and as a consumer of alcoholic beverages and manufactured trinkets.

By 1800, it was clear that the French were prepared to incorporate the whole Sahelian area into their imperial system. The slave trade had ended in 1915, and the Europeans sought other uses of the area in addition to a plentiful source of gum arabic, ostrich plumes, and spices.

VII. Agriculture and the Colonial System

While the French could initially do little with the agricultural potential of Senegal, the local people had successfully integrated an American-derived crop, the peanut, into their economy, and were producing it in potentially exportable quantities. In 1840, Jaubert, seeking some way to exploit the crops growing in the region, sent some 722 kilograms of peanuts to Marseille as a test. Richard-Milard records that "success was immediate; it was necessary to send machines, to introduce railroads and later to send steam vessels."

Economically, the Sahelian colonies were exploited by a number of giant monopolies: C.F.A.O. (Compagnie francaise de l'Afrique Occidentale), S.C.A.O. (Societe Commerciale de l'Ouest Africain --which had French and Swiss capital), and Unilever, a primarily British and Dutch holding company which dominated the world market in vegetable oils, and was represented locally by its affiliates; United Africa Company, Nsoco, Compagnie du Niger Francaise, and the Compagnie francaise de la Cote d'Ivoire. The giant companies in the Sahel worked closely with the French administration to organize their depots and to obtain the raw materials they needed for export.(4) They utilized Lebano-Syrians, some French and a few African merchants to distribute the goods that they imported.

Initially, the people in the Western Sahel refused to abandon their traditional economic organization to produce crops for export. In order to force them to do so, the French administration levied taxes to be paid in European currency.

VIII. The Problems of Development During the Colonial Period

Whether one agrees or disagrees with those French colonial administrators and contemporary African scholars; who claim that France almost ruined the Sahel in attempting to exploit it, it is quite true that the French were never able to transform the region to facilitate development or to

establish viable links between its people and the outside world. There is now widespread agreement that France's penetration of this area was marked by confusion and disorganization.

In almost every cercle or district headquarters, there were dismal remains of the technical paraphernalia of projects that did not work. The result was that peasants grown wise in the ways of the Europeans were loathe to respond to innovations even when assured by their leaders of the possibility of success. The problem here was that despite their oppositions, many rural people hesitated to speak out, thereby suggesting by their silence their acquiescence. The denouement came much later when the innovation failed and frustrated officials were too embarrassed to admit that the peasants never really agreed to the projects in the first place. The economic constraints on accepting innovation were often difficult to overcome. People who lived very close to the subsistence level were reluctant to innovate; for failure could spell disaster.

IX. Nomadism and Agriculture

For example, the patterns of nomadism and agriculture practiced in the region had evolved over time. By the 1950s, they represented adaptation to the demands of a colonial system which had insisted on the production of export commodities. In other words, slow but steady changes did take place during the colonial period. Ironically, sentiment persisted both among the pastoralists and administrators, that the herders preferred transhumance and a migratory life to agriculture, despite the presence of a growing sedentarization of pastoralists and their adoption of a mixed economy when conditions were suitable. In Niger, Dupire found that the Fulani passed relatively easily from one type of pastoralism to the other, and became sedentary mixed-cultivators. This was proof of their ability to adapt to changing conditions. She concluded that "Nomadism is not a mystique for the Fulani, but a submission to the conditions in the physical milieu which, moreover does not blind him to the advantages of the sedentary life."(5) Tuaregs and Bella (Bouzou) also became sedentary when the circumstances permitted. They adapted mixed-agriculture using cattle to fertilize fields, and sent young boys into the bush with herds during the planting season. They, too, took advantage of the two economic possibilities in their environment.

Dupire concluded that the biggest problem in the Sahelian region was always the lack of water. She was con-

vinced that the creation of wells "would resolve this painful dilemma for the sedentaries as well as for the pastoralists."(6) What was not understood by the French was that the Fulani, Tuaregs and other Sahelian pastoralist populations had a fairly good idea of the number of animals required to support families under ordinary (and perhaps the worst) conditions. They tried to maintain this number even in the face of administrative pressure. Often their behavior appeared bizaare to foreigners, and other Africans, since they did not sell their cattle at the most propitious time to gain the maximum profit. But there were environmental, cultural, as well as moral reasons for this type of behavior. The possession of cattle did give the herder "social prestige which he can acquire in no other way and gives him psychic satisfactions in comparison to which the enjoyment of foreign goods or luxury articles remains qualitatively negligible."(7) But there were such practical considerations as the fear that the money obtained by selling their stock might be stolen or lost, nor to mention the temptation to spend it for trivial purposes. Thus the resistance of pastoralists to sell their cattle for money was in very many cases the "reflection of a wise prudence," at least so long as they did not feel that their own security and that of their cattle, in an ungrateful region, had been brought to a new economic equilibrium.(8)

The problem for the herder and innovators alike was that their ideologies, beliefs and values often lagged behind the technical changes that had occurred. They often took emergent patterns for granted without even acknowledging a change in the pastoral way of life. The pastoralists were willing to change, and they were anxious to increase their revenue. Nonetheless --like most people-- the herders were not willing to change their economic behavior unless they were convinced that they would directly benefit. If new economic activities were designed to produce material benefits to the herder, these benefits were sought because they contributed toward the satisfaction of the social needs of the people themselves. Force was used periodically to compel the pastoralists always reacted by escaping these constraints even though their own behavior was changing in the direction sought by the administrator.

The relations between the nomads and the settled agriculturalists in the Sahel had also not been static, but had been evolving over the years. The nomads exploited lands too marginal for the agriculturalists. They moved into the agricultural areas during those periods when their normal habitats were too desolate to maintain their flocks. Under ordinary conditions, the agriculturalists welcomed the presence of the herders. Stenning, who worked in Northern

Nigeria during the colonial period, describes an extensive symbiosis between pastoral Fulani and neighboring agriculturalists. Except perhaps in the Sahel, he tells us, "the pastoral life is pursued not in isolation, but in some degree of symbiosis with sedentary agricultural communities. Alongside the continuous exchange of dairy products for grain and other goods, there have existed, possibly for many centuries, arrangements for pasturing cattle on land returning to fallow, and for guaranteeing cattle tracks and the use of water supplies. Pastoral Fulani did not, and do not, merely graze at will, but obtained rights to the facilities they required from acknowledged owners of the land. The payments in kind made for obtaining the rights were not mere economic transactions but involved the Pastoral Fulani in the local ritual observances relating to land."(9)

Sometimes transhumance did lead to conflict such as when both herders and pastoralists competed for the same areas. When and where the pastoralists were victorious, they not only took over the lands of the agricultural populations, but often established a kind of patron-client hegemony over certain groups of agriculturalists (Bella or Bouzou). When, however, the pastoralists were bested, they moved off with their herds to seek better arrangements with other agricultural populations. Even during the colonial period the periodic droughts and epidemic diseases, decimated some herds, many pastoralists temporarily adopted agriculture. However, as soon as their herds recovered, they resumed their nomadic existence, even though they retained viable relations with the agriculturalists.

The conquest of the Sahel and its incorporation into the French colonial empire,did affect the relations between the nomads and the sedentaries. The abolition of slavery freed the agricultural captives of the pastoralists, although it did not end the patron-client relationship between them. The French attempted to sedentarize the pastoralists in an effort to curb their mobility and to incorporate them into the colonial structures that were being implanted. The pastoralist often escaped by crossing territorial borders, and were able to resist sedentarization and avoid involvement in the many schemes that attempted to develop the region. The irony was that once many agriculturalist schemes were launched, the pastoralists were unable to move their flocks into areas as in the past. Moreover, they gained the reputation of resisting all change and were viewed with disfavor by both the agriculturalists and the administration.

Despite their mobility, the pastoralists were unable to withstand the intrusions of the colonial regime into their

affairs. Gradually the French district commanders persuaded the Fulani rulers to settle down, and serve as links with the nomadic populations. The result was status differentiation with formerly, fairly egalitarian populations. Gradually, the influence of the colonial regine's activities led to an increase of population among both the human and animal populations of the nomads and agriculturalists. The nomads, being more marginal to the colonial system, were at a disadvantage in this competition. Lack of education, and lack of knowledge of the colonial institutions reversed the status relations that formerly existed between them and the agriculturalists. It was only in the areas truly marginal to the administrative centers, that the traditional patron-client relations between the nomads and the agriculturalists persisted. As more persons from the agricultural societies joined the subaltern cadres of the colonial regimes,they eradicated "feudal-like relations"between the nomads and their agricultural vassals.(10)

Every extension of the colonial regime into the traditional economic and social relations of the nomads and sedentaries, eroded nomad dominance or privilege. The exception was in Mauritania, where the demographic superiority of the Islamized nomadic people, did not facilitate the development of the colonial-derived high status of the sedentaries. However, even here the nomads were at a disadvantage, since they were victims of an alliance between the sedenterized nomadic peoples and the agriculturalists pitted against those who remained truly nomad. The split between the Town Fulani (Gidda) and the "Bush" Falani (Boroje) that occurred in Nigeria was replicated in the western Sahel. In Nigeria, the ethnic factor which linked the two Fulani communities, became less important than those factors that linked the town-dwelling Fulani and the town-dwelling Hausa. By the end of the colonial period, the ability of the nomads to continue their way of life was increasingly being threatened. As agricultural populations improved their techniques, they were increasingly reluctant to permit pastoralists to use their lands.

X. Agriculture

One of the major issues that faced colonial administrators in the field of agriculture, was whether or not cultivators would agree to adopt individual tenure. Indeed, many agronomists argued that African agriculture would never become efficient unless the peasants shifted from "farm tenure" or "usufruct", to individual holdings. Pelissier, who studied agriculture anong the Sere of Senegal, contends that without institutional indiviudal tenure and mixed farming, the

multiple pressure of demographic increase, Islam, the exigencies of commercial economy and the spread of urbanization could have grave implications for their society. He concluded that "the issue is less in discovering technical solutions than in substituting in one way or another the concept of 'geographic patriotism' for the present 'biographical patriotism' which among the Serer would facilitate the introduction of a genuine land tenure system."(11)

The issue here was perhaps not individuation of land tenure per se, but what this change might have meant to the relationship among people in a lineage --the institution in which land and other goods and services were vested. Individuation in land did imply individuation in family or lineage relationships. But if lineage membership meant anything, it meant the mutual cooperation of its members against the exigencies of life, particularly the economic ones. A man therefore unconsciously resisted detaching himself from his lineage in order to cultiveate his own plots, unless he was assured that he would receive a just return for the fruits of his labor. The problem during the colonial period was that there was no such guarantee. And unless people could have been assured that they had the ability to survive isolation from their lineage through the individuation of land, they would remain linked to the lineage and through it to the traditional farm tenure system.

The spectacular growth of vegetable gardening (jardins maraichers), in and around the emerging towns and larger villages in the Sahel zone at the end of the colonial period, suggests that cultivators willingly adopted modern forms of agriculture, and that the issue of individuation in land was not proving insoluable once the benefits become clear. Near every dam, waterhold, or stream in the vicinity of these agglomerations, were peasants cultivating garden vegetables to supply the urbanizing populations. In many cases, these plots were acquired by the peasants using tradi tional land tenure practices. The potential user sought permission to use the land in return for goods and services. If the land was unused, the owner or custodian permitted the applicant to use it, with the stipulation that tenancy was assured unless revoked for particular reasons. In any case, the question of tenure was muted since the crops cultivated were annuals, that is, they were sown, cultivated and reaped during the course of a single year. Thus, if the proprietor wished to regain his plots, he simply gave the occupant one year's notice to vacate. And since the occupant had not tied up too much labor and capital into the land, he saw little difficulty in surrendering the plot. Of course, the situation would have been different if the occupant had

planted perennials and had invested a great deal of capital in the plots. The significant fact is that the issue of individualism in land seldom arose, unless the proprietors tried to retake the plots to give to persons who promised more money or gifts.

So important was the income from the vegetable gardens, that this type of cultivation diffused from the large urban centers to the country districts. One district commandant in colonial Upper Volta told the writer that the future of agriculture in his area lay not in traditional agriculture, that is, cultivating the cereals or cotton, but in the jardins maraichers. The problem for this official was how to get the necessary water supply for these types of projects. He felt that by doing so he could retain the young people in the rural areas, where they could produce enough food for themselves, and for export to larger towns.(12)

Few attempts were made by the administrators during the colonial period to expand these small-scale holdings into large-scale agricultural complexes. True, some administrators favored certain chiefs by permitting them to dragoon local labor to incerase the acreage of fruit orchards. This was especially true in the Upper Volta and in most of the territories in the Sahel. Yet, the problem for any such large undertaking was the need for water, although the experience at the Office du Niger during the colonial period suggests that water was not the only problem. The problems posed by expansion in scale of the all agriculture projects in the Sahel were major ones. When large-scale projects were developed, the major decisions were taken out of the lands of local peasants. Agronomists, who were often unfamiliar with the historical vargaries of the area, were placed in charge. Even when they were sympathetic to folk wisdom, they were not able to ask the relevant questions. The waning colonial regime introduced cooperatives, but these cooperatives, linked to larger systems, were often incapable of responding to local concerns. Besides, the cooperatives, in order to maximize their efforts had to make greater demands on the local systems than could have been met. The result was often conflict: missed schedules in production; misunderstanding of price accords; charges of mismanagement, corruption and stupidity; and the breaking of agreement by either the regime or the peasants. The perennial problem was: how could one move from efficient small-scale production to large-scale production without snafu? Was it possible to incorporate the emergent small-scale changes into a larger system of change, rather than impose drastic change on local systems that had no way of accommodating these changes? This problem was never satisfactorily solved during the colonial period.

XI. Technology Transfer and Women

Colonial attempts to improve agriculture and livestock production in this region through large-scale projects, large-scale ranching schemes and small-scale mixed farming did not pay much attention to the role of women. True, the administrators all recognized that traditionally women had always participated in the herding and agricultural work in Sahelian societies. Among the Fulani, women milked the cows and young girls helped the boys herd the cattle. Wolof, Bozo, Serer, Mossi and Songhoi women helped the men sow, cultivate, and harvest crops. Women toiled alongside men in the cooperative fields of their extended families, and in addition had small individual plots, where they cultivated vegetables, condiments for sauces, or tobacco for sale in markets. Nevertheless, French colonial administrators always hesitated to use African women in those agricultural schemes that they introduced. Most of the administrators had come from the urban centers of France, and had the impression that only men were suitable for agricultural work. Ironically some administrators used women to transport cotton to the large collection centers and to level roads with iron rollers. These were criticized by the Africans who resented their female relatives being subjected to European forced labor, and by European missionaries and travellers who viewed such female work with horror.(13)

Most administrators in the Sahel were not cognizant of the increased participation of women in the traditional agricultural sector as men withdrew from this work to serve as forced laborers, forced cultivators, soldiers, or as seasonal migrant labor to distant regions. True, the women seldom cleared new fields, but they intensified their activities in other aspects of agricultural work, and reduced the amount of time they spent on their individual fields. As the fertility of the over-used fields declined, the ability of women to increase food production also failed. Thus, the women, though unseen, were victims of the economic problems of the Sahel.

Post World War II, pre-independence attempts at introducing voluntary changes in agriculture in this region, usually did not involve women. Then, too, the reasons were largely cultural. Westerners, and educated Africans were loathe to place African women behind the animal-drawn plough, the most widespread type of agricultural innovation. Again, most officials did not consider sending the few educated African women to foreign schools or to any school, in order to learn improved agricultural techniques. They felt that such women were desperately needed in other crucial areas of

development, particularly agencies devoted to social change.

The early attempts to educate Sahelian women ran into several social and cultural obstacles. The Moslems in this zone, especially the Maures, refused to place their daughters under the tutelage of Christians for fear they would forsake Islam or be induced to leave their families. The non-Moslem traditionalists in the area had some of the same concerns, but in addition, feared that their practices of infant betrothal and child brides would be jeopardized. Since many of these groups either promised girls to husbands while still small, or married them off while still quite young, parents had to consider the views of their sons-in-law, before sending their daughters to school. And since many of these actual or potential husbands were seeking wives and not school girls, they were hostile to the education of women.

Many people throughout the region subscribed to the adage: "If your sister goes to school, your next meal will be your fountain pen!" Another problem was that parents and husbands placed so much value on the work of girls, both in the homes and in the fields, that they refused to permit them to go to school. As far as these persons were concerned, the recruitment of male children for schools (seen as a form of childhood forced labor) was bad enough; to submit girls to this experience was viewed as intolerable. The result was that by 1935, there were only 2,060 girls in Sahelian village schools, and only 15 or so women were being trained as nurses and midwives in Medical School at Dakar.

XII. Cultural Factors and Development

The cultural constraints to development during the colonial period were often more difficult to surmount than the economic ones. Primarily located within the domestic group --a sphere of social action which few state systems (even colonial ones) have been able to influence-- the social constraints proved to be formidable opponents. As reported above, the extended family and the segments of lineages were the social fields of greatest importance to the people in the Sahel. These institutions controlled the basic resources of their members, and regulated the way in which they dealt with the outside world, economically, politically, socially and ideologically. The colonial regime had the power to change many of the economic and political structures of the societies in this region, but it did not have either the power of legitimacy to effectively change the social and religious institutions of the people they conquered. Moreover, there is little indication that the colonial regime viewed the traditional African social systems (outside that of domestic

slavery), as impediments to economic development and therefore the loci of attempted change. Colonial administrators did have the normal ethnocentric attitudes of all people toward the institutions of others --especially those they had conquered and now ruled. Yet, they were so short-handed that they feared to interfere in the domestic affairs of their charges and risk stirring up rebellion. Moreover, many of these men subscribed to the philosophical views of Montesquieu and Gustave Le Bon, and considered the social institutions of Africans as well adapted to their milieu.

The missionaries were the ones who insisted that the African social institutions be changed. They saw these institutions not only as impediments to the spread of their gospel, but also to the introduction of "western civilization" in general. The missionaries attacked these institutions whenever they could, but it was the actions of the colonial regimes in the economic and political spheres that provided the greatest impetus for the Africans to change their social institutions. For example, it was taxation, forced labor, and forced cultivation, that eroded the corporate nature of the lineage. Even when the administration backed away from individual taxes or taxes on women and children, the need of African families to enter the money economy in order to get money to pay taxes affected family lineage cohesion. This occurred because the heads of families lost absolute control of the goods and services of their charges and thereby the ability to control their lives. For example, the livestock and labor traditionally used as bridewealth by many of these populations entered a universal market economy. Subsequently, young men were able to arrange marriages without the help of their relatives. Once this happened, preferential marriage rules started to change, and so did locality rules.(14)

The institution of forced labor which took young men away from their villages not only weakened family ties, but expanded the social horizons of young people. For the first time, the youth were able to compare their own institutions with those of foreign peoples. When they found these institutions more satisfactory, they were more prone to criticize their traditional institutions. They were also now free to leave their communities, if they resented the authority of their elders, neighbors or chiefs. For example, those men who no longer viewed agriculture only as a means of subsistence, but wanted cash from it, often resented their inability to sell part of the crop collectively produced and left home. Again, young men anxious to marry with the ability to earn money for the bride wealth, no longer willingly waited for the permission of their elders to wed, and instead arranged their own marriages, or left home.(15)

Perhaps the greatest impetus for social change in the Sahel was the development of new cities by the colonial regime, or the transformation of indigenous towns into administrative centers or commercial entrepots. The development of Saint Louis, to serve the needs of Mauritania and Senegal, and the establishment of Dakar, to serve the whole federation; the transformation of Bamako and Ouagadougou into modern capitals; and the creation of Niamey and N'Djamena in Niger and Chad, respectively, provided a magnet for the ex-soldiers from colonial and world ward, who could no longer tolerate the traditional institutions of the rural areas. In addition, such centers served as a haven for persons escaping social, economic and political problems in their home villages.

Once in the cities or in the large towns, the migrants were enmeshed in a different social ambiance.(16) Some tried to recreate their traditional institutions and to establish ethnic wards in the towns, but nevertheless the total environment of the towns tended to modify these institutions. Moreover, town life did not encourage the persistance of lineage ties, plural marriages, and the traditional division of labor between men and women. New needs arose, and people were constrained to meet these needs by increasing their articulation with the economies of the metropoles. Many of these urban populations were ready to adopt new lifestyles; the problem was that their countries were still too poor to make this way of life a possible alternative.

The rapid growth of towns in the Sahel region had an effect on the rural communities. Not only were the families without men constrained to change their economic activities, but the reduction of resources substantially reduced the power of family and lineage heads. They were no longer able to act for, and make alliances in the name of their dependents. Nor were they able to control the behavior, lives, and destinies of young people anxious to move to the towns --the centers of modern life. Parents witnessing the increasing rural exodus became anxious to have more children to remain at home and provide insurance for their old age, and for the continuity of families, whose members were now scattered far and wide.

Not only were the bonds between families loosened by the rural exodus and the growing nucleation of urban households, but different life experiences and incomes produced status differentiation among relatives. This occurred despite the persistence of the ideology of familialism or traditionalism. The cleavages among kinsmen produced by educational differences, economic differences, religious differences, and residential differences, increased despite attempts to control

differences by family gatherings, mutual aid to poorer relatives or ritual visits to home communities. Even the cohabitation of family members belonging to different strata did not diminish social distance, because these relatives participated in different social, economic and political networks. However, important status differences did not emerge among Sahelians during the colonial period. And French assimilationist's ideology to the contrary of the basic cleavage in Sahelian societies, which were between black and white.

The educational experience of the people in this area influenced how they reacted to attempts at economic change. Indeed, many development plans produced for this region failed, because the planners did not take into consideration the educational profile of the colonies involved. Before the arrival of the Europeans, Koranic schools throughout the region provided a classical Muslim education for their pupils, It was only when the missionary and government schools were introduced, that the students were procided the basis for dealing with the dominant western institutions. Even so, the nomadic way of life prevalent in the northern areas, restricted the development of schools and the introduction of modern education.

XIII. Postwar Attempts at Development in the Sahel

It is difficult to get an objective balance sheet on the European colonial period in the Sahel, or for that matter, in any part of the world. Important to a comprehension of the problem of development in the Sahel, is an analysis of what occurred when France embarked on a whole series of development projects in the region intended to thwart the nationalist movement.

As Houphouct-Boigny indicated in 1948, the French created FIDES(Fonds d'investissement pour le development economique et social des territories d'Outre-mer), and by 1954, had spent some 80 billion CFA francs on such projects in the Sahel as roads, railroads, ports, hospitals, and schools. During the same periods, the Caisse Centrale de la France d'Outre-mer loaned part of some 20 million CFA francs at both long and medium range terms to public, private and mixed groups in the Sahel. In 1949, the French government created FERDS(Fonds d'equipment rural pour le development economique et social), and by 1955, had spent part of a total of three billion CFA francs in the Sahel on rural development. Some of these funds were allocated for development projects, such as the Office du Niger, designed to provide irrigation on

the Niger river, and increase rice production in the Sahel. The French stimulated research in Senegal at the Richard-Toll agronomic center, extended the work of such institutions as O.R.S.T.O.M. (l'Office de la Recherche Scientifique et Technique d'Outre-mer), organized O.R.A.N.A. (l'Organisme de Recherche sur l'alimentation et la nutrition en Afrique), and supported new research at I.F.A.N. (l'Institut francaise d'Afrique noire). Thus France made a start towards developing the Sahel by providing funds for all of the major sections of its ecosystem. But as the following case studies demonstrate, it was one thing for French economic planners and their, now increasingly active, African counterparts to plan development in the Sahel; it was another to accomplish it.

CASE STUDY NO. I

Rice Production in Senegal : River Basin Development

In 1946, the French colonial government launched a plan at the Richard-Toll agronomic station to develop mechanized rice production through the irrigation of the Senegal river's delta. The intention was to meet the food needs of a peasantry, locked-in to the production of peanuts and importing a great deal of rice. The hope was that in ten years time, some 50,000 hectares of rice could be brought into cultivation, thereby assuring the people of an adequate food supply.

The first experimental plot of 120 hectares was planted in 1947, with the use of mechanized techniques. Indeed, mechanization was an overriding characteristic of the scheme. Every phase of the work was automated. Machines were used for seeding fertilizing, harvesting, threshing, and even for bagging the rice. Other techniques --such as aquatic germination, which eliminated the need for transplanting -- kept the use of unskilled labor down to a bare minimum. And when the first fields yielded as much as 24.6 quintals per hectare of excellent quality paddy, there was an indication that the Richard-Toll experiment had found the answer to Senegal's food problems. This wa allegedly accomplished ". . . without either the displacement or the participation of the local population."(17) Officials felt that in Richard-Toll, they had created a "modern"rice producing operation.

It appears that the officials had not fully understood the principle of ecological interdependence. Natural catastrophies soon began to take their toll of rice production.

The first problem was soil salinization. This was finally solved by closing off the flow of salt water which, during the dry season, came upstream a considerable distance. The second problem was dust storms, but not much could be done about them. The third and most devastating problems were the more than 45 million queleaquelea birds which came in droves and ate the crops. In 1952, they destroyed half the harvest. The administration launched a massive effort to rescue the project and spent 500 million francs CFA in an anti-avian campaign. In 1953-54, some 90% of the birds were wiped out, but at a great cost to the project.

In spite of the heavy expenditures and degree of technical success, rice production in Senegal began to stagnate after 1956. Average yields, which had reached a high of 30.9 quintals per hectare in 1956, dropped to 26.4 quintals per hectare in 1960. The project manager attributed this decline to the re-appearance of the queleaquelea birds and the invasion of the paddy plantation by wild rice. Nevertheless, they felt that the use of modern techniques and high-yielding strains of seed had been a success.

Whatever the cause, the Richard-Toll experiment did not succeed in producing sufficient rice to cover Senegal's needs. In 1960, the project's total rice production (about 15,000 tons), represented only 10% of Senegal's total rice consumption. A more pressing problem was the fact that the scheme did not help Senegal solve its heavy unemployment problem. During the harvest period, when the largest labor contingent was used, the project employed only 18 men for every 100 hectares under cultivation. At other times of the year, the project work teams consisted of only 6 men per 100 hectares. This low employment record might not have been a problem had the project been economically successful. But by 1960, the total cost of the operation approached 2,700 million francs CFA. Considering such an investment, the results obtained both in terms of production level and the provision of jobs were mediocre and disappointing.

This case study of the problem of rice production in Senegal, and the fate of the Richard-Toll rice experiment demonstrated that the development planners in this region did not pay close attention to all aspects of the ecosystem. The natural environment was not studied well enough to forestall salinization;the biota was not observed with enough care and forethought to avoid such disasters as the queleaquelea birds and the infestation by wild rice; and the effect of prices and economic policies on the human population was not carefully thought out. The total mechanization of rice production at Richard-Toll was bound to have a profound effect

on that project's contribution to Senegal's economy. Here was a case where the too often unquestioned efficacy of Western agricultural techniques turned out to be inappropriate in a particular African context.

CASE STUDY NO. III

Cultural Impact of the Logone Valley Project in Chad

The failure to take the social institutions of the Massa people into consideration caused serious problems in the Logone Valley project in Chad.(18) Concerned that Lake Chad was drying up, the administration ordered a study of the basins of rivers flowing into the lake in the hope of controlling flooding with the additional objective of instituting economic changes, expecially the growing of cotton. Intimately affected were the Massa people, a semi-nomadic population living along the Logone river, who retreated with their animals to the highlands during the six months of the year when the river was in flood, and returned in the dry season to fish and grow millet.

Initially there were no studies of how the riverine populations would react to the new scheme, nor of whether the soil in the Logone valley could sustain cultivation or large dams. In 1952, dikes were built and land bulldozed for cultivation. By 1953, the project ran into difficulty. The dikes, which were simply renovations of older structures, started to break; the response was to patch up or rebuild section of the system. More difficult to solve were the agronomic and human problems. The soil was not suitable for growing cotton, and by 1958, the private firms that had reserved land along the dikes had either abandoned them or had switched to producing rice. But even so, the project was deemed both a technical and economic fiasco. Close to 1 billion francs CFA had been spent, to say nothing of the continuing yearly expenses of keeping up the dikes and maintaining the drainage canals.

The impact of this project on the Massa was potentially shattering. In 1955, a report by the Conseil Superieur des Recherches Sociologiques, appraising the probable effects on the peoples of the Logone Valley of this radical change, stated that the Massa were extremely reluctant to accept the proposed innovations. They complained that the scheme was interfering with their fishing, and it was forcing them to drive their herds too far in search of pasture. They

were also reluctant to participate fully in a scheme which would mean changing their semi-nomadic way of life and settling down permanently to engage in year-round agriculture. They were unwilling to grow cotton, and were unenthusiastic about growing rice, since they preferred their traditional diet of millet. Moreover, the Massa had no economic incentives for growing these two crops. The prices for rice and cotton in Chad in 1958, were 8 francs and 16 francs a kilo, respectively. Thus, the peasants were not interested in raising either cotton or rice commercially. By 1960, when Chad became independent, only a few Massa had settled on the reclaimed land. This failure may have been avoided, if sociological factors were studied before the project was begun. Then many of the social constraints to change and development may have been identified.

XIV. Institutional Inadequacies in the Face of Contemporary Problems

Independence presented the Sahelian countries of West Africa with almost insoluable problems. Except for Senegal, which had in Dakar (former seat of French West Africa) a capital, worthy of a modern nation-state, all of the other countries felt constrained to use their scarce resources to build adequate administrative centers.

Although the new states were creating new administrative services, they were having great difficulty developing the economic base to support these services.

Almost all the Sahelian governments found that although they would have liked to limit the amount of money spent for social services, in order to develop their productive sectors, demographic changes, as well as rural-urban migration, prevented them from doing so. As a result of inter-war and post-war development of health services, the population of the six Sahelian countries passed twenty million (today it is between 22 and 23 million) and is increasing at the rate of about 2.0 to 2.2 percent per year. Even if the governments had developed a population policy, they did not have the means to institute family planning --besides, this is a more complicated problem than many people are willing to admit. The result is that the populations are still growing; and the people are demanding employment, goods and services. When these are not available in the rural areas, people migrate into the urban areas, putting pressures on weak urban economies and depriving rural sectors of their labor and the government of rurally-derived taxes. The failure of the

Sahelian states to provide economic opportunities to their citizens has contributed to the fall of two governments in the region.

XV. Drought in the Sahel

A number of the factors previously cited were operating in the Sahel, when nature added to the woes of the region and threatened its ecosystem. Many geographers and climatologists assert that since 1940, "something has intervened to make the earth cooler and to make the dome of cool air covering the polar regions increase in size."(19) This has resulted in the gradual displacing of all climatic zones a few latitudinal degrees closer to the equator. While the equatorial regions received more rain than usual, there was a growing crisis in the Sahel, where, in the words of one climatologist, "life is balanced on a knife's edge by the success or failure of the summer rains." Since about 1966, local meteorologists have noticed a net decrease of rainfall in an area which normally received between 100 and 400mm from May or June to September or October. Some climatologists suggest that the change was cyclic --one famine occurred in 1910-1914, another in 1941-42, and another one was due in the 1970s. Other scientists did not believe that there were enough data to indicate either that the droughts were cyclic, or the result of permanent changes on a continental scale. Moreover, these people denied that the Sahara was spreading south thirty miles a year. Most climatologists do agree that the World Weather Watch system should be made more effective so that microm changes can be foreseen and people can be warned to expect changes in their microm systems.

By 1970, the Sahelian populations noticed a rapid decrease in rainfall, and by 1972, they realized that their ecosystem was seriously threatened. In less than three years, the water table throughout the region had fallen 20 meters or 100 feet. The Senegal river which normally crested at 26 feet during the height of the rainy season, crested at only 18 feet in 1972. Lake Chad, with its fluctuations having always been a guide to the amount of precipitation in the region, dwindled to one-third of its normal size. In 1972, it contained only 12,000 million cubic meters of water, whereas in 1970, it contained 31,000 million cubic meters.

The effect of drought within an area of increasing aridity was disastrous for the biota: plants, animals and people. For example, in Senegal, where the normal rainfall is some 300mm, only from 50-120mm fell. The result was that the 600,000 tons of peanuts and about 700,000 tons of millet

and sorghums harvested in 1970, would be reduced by one-third and 55 percent in 1973. The shortage of water and pasturage actually reduced the Senegalese livestock population of 2.7 million cattle and 2.8 million sheep from about 20 to 40 percent. Comparable or worse figures were gathered from the other countries, with Mauritania and Niger being especially hard hit. So drastic was the shortfall of crops in the region that by March-June, 1973 (known as the "hungry-period" because the previous year's food is almost exhausted and the new crops are not yet harvested), some two million out of Mali's population of five million had been affected by hunger and thirst; the United Nation's FAO had declared the Upper Volta a class D drought area; and hundreds of thousands of people in Mauritania, Niger and Chad were fleeing the northern areas and were congregating around the southern most towns and cities.

A shocked world discovered that unless emergency measures were quickly taken, some six to ten million people might die of hunger. (20) To add to this tragedy, there were reports that cholera, virulent measles, scurvy, meningitis and other diseases brought on by malnutrition and poor sanitation were on the increase. The threat of pestilence was added to the misery of famine. The children of the region were especially devastated; in Niger infant mortality is normally about 50%, but the drought and famine greatly increased this rate. Government and relief officials feared that unless help came quickly, the herds of the nomads would decrease beyond recovery, and the human populations would consume their seed grain and thus be unable to plant crops for the 1973/1974 year.

There are still many questions, arguments, and discussions about whether the governments in the Sahel region were aware of their growing plight; whether or not their alleged early pleas were heeded by a world engaged in other affairs; whether the aid that was sent was too costly, too little and too late; and whether the aid that was sent was badly used, or not sufficiently acknowledged or appreciated. This was to be expected, given the extent of the disaster, the passions it aroused, and its economic, political, social and technical implications. What is not contestable is that the Sahelian ecosystem --under enormous pressure for decades-- have been badly impaired. Unless the reasons for this are understood, all discussion will be in vain and will not lead to the restoration of equilibrium or the elaboration of a larger and more viable ecosystem.

A number of African and foreign scholars have identified the factors within the Sahel that have exacerbated its

difficulties. These include the progressive destruction of the vegetation caused by an increase in domestic animal populations; the accelerated destruction of the light soils due to the burning of the grasses, shrubs and trees, either to provide new leafage for the animals, or new land for cultivation; local climatic changes caused by the destruction of trees and forests by people seeking more fuel (this is especially severe around the burgeoning urban centers where modernization and changes in life styles necessitate the use of more fuel); and a growing human population which is especially dangerous, since man is more destructive of his habitat than any other living creature. The view of these Africans is that unless some means can be found to halt the vicious cycle within the ecosystem, there will be disaster.

There is little doubt that the inability of the officials of many of the Sahelian states, like that of other Third World developing countries, to make major changes in the economies of their societies, was at the core of the demand for a NIEO. Yet, both they and the developed world should examine at length not only those factors surviving from the Colonial period, which continue to prevent development, the so-called "external" factors, but also the equally important "internal" factors that continue to do so. For example, one issue that arose during the decolonization period and continues to attract some attention among scholars and planners, is whether or not the Sahel ecosystem can be made viable, given the multiplicity of nation-states that now exist within it. True, at certain periods in the past, there were more independent societies in the region than there are today. But it is also true that the Sahelian societies achieved their greatest florescence when they were quite large. One only has to think of the past greatness of ancient Ghana, Mali and Songhai. These states grouped various types of societies, inhabited different environments, and had rather complex economies. We also know what happened when these ancient Sahelian ecosystems failed: famines, wars and disasters. Is the same thing happening today? The European conquerors of the Sahel initially had small colonies; however, they soon found it profitable to create a federation in the region, link the colonies by roads and trade. When the total area was threatened by economic disaster in the 1920s, the French dismembered the Upper Volta colony and distributed its parts to the surrounding territories to increase their viability. The French were only promoting their own interests when on the eve of independence, they encouraged or tolerated the balkanization of the federation.

Almost all of the post-independence attempts at larger and more viable Sahelian entities foundered on the

shoals of political ambitions --rather than economic difficulties. This was true of the Mali Federation grouping Senegal and the Sudan, the West African Economic Community, the Organization of the Senegal River States, and others too ephemeral to cite.

Despite the disagreements between political leaders in the Sahel, the rural people have continually crossed both natural and political boundaries in the pursuit of a better life. Agricultural populations have been moving over the landscape in search of better lands unhampered by political considerations and often in spite of political constraints. And when the rural youth can no longer satisfy either their traditional or modern desires, they have not hesitated to migrate to the larger towns within their own countries or the industrial or plantation centers of neighboring ones. Similarly, the pastoral populations have continued their transhumance cycles across national boundaries, and in the absence of valid reasons for sedentarizing, have resisted the efforts of governments to keep them in place.

XVI. Drought Response

The smaller Sahelian countries had neither the infrastructure nor the resources to meet the trauma of drought and famine. First, their communication systems were so weak that even when the local leaders knew the scope of the problem they were unable to dramatize it to the outside world. True, the African ministers met in Ouagadougou in March (1973) to plan their strategy, but it was only when such international papers as Le Monde, the Manchester Guardian, The New York Times, and the Washington Post picked up the story that the world became alarmed, and the personnel from the United Nations, USAID, and the U.S. State Department would have their voices heard. Nevertheless, not one of the major world powers nor relief agencies could deal with the problem by itself. France, which still controls the major economic interests in the region, did not have the resources (including the cereals that most of the people use) to deal with the crisis. The result was that the United Nations agencies had to be mobilized, and nations friendly to the states of the region had to cooperate in order to help. The neighboring African states below the affected area --such as the Ivory Coast, Guinea, Ghana and Nigeria-- gave what help they could. The United States channelled sorghum to the areas from coastal ports as far south as Cotonou, and this grain together with milk products from Belgium, Canada, France, Germany, Holland, the USSR and other nations were air-lifted into the remote areas by planes from the American, Belgian, French and German Air

Forces.

The major problem encountered by relief agencies was the lack of local structures to serve as conduits. This was due to different administrative and political traditions and differences in scale. Western countries with hundreds of millions of inhabitants, with scores of political units, and with budgets often running to billions of dollars, simply did not have either the traditions or the structural elements to relate to countries which were sparsely populated, with embryonic political units, and with very small budgets. Consider the problems of the United States of America when dealing with the six Sahel countries whose total population is equal to the state of California and whose annual budget of $600 million is two-thirds that of Washington, D.C. People from these two ecosystems must have difficulties conceiving their respective problems, since they do not have common points of reference. These difficulties are compounded when the interactors do not even realize that they face structural differences, as well as sociocultural ones. The result is that even with the best will in the world, people from large scale societies could not plan effectively for smaller scale ones. When failure ensued the people involved charged each other with incompetence or bad faith.

XVII. A Paradigm for Dealing with the Poorest of the Poor in the Sahel

In order for any paradigm or model to help the public for whom it is intended, its point of departure must correspond as objectively as possible to the reality in which people find themselves. This truism may sould like a cliche, but it is seldom recognized, since by definition, any paradigm for change is mainly concerned with the future. The result is that theorists or planners often ignore the present as they devote their energy to dealing with the future. When this occurs, failure is built into the paradigm, since it can have little relevance to the reality involved.

Expatriate developers should recognize that the new emphasis on reaching the poorest of the poor in the world's villages,is often interpreted by national developers as an attempt to continue to control the pace and nature of Third World development. This attitude is unfortunately reinforced by the often spoken and unspoken assumption of the expatriates that development on the village level is not only more effective, but cheaper. These expatriates argue that instead of the grandiose and costly country-wide projects which failed, more modest projects designed with the local

poor farmer in mind, might well succeed. From the perspective of the national developers, the issue with this new approach is not only that it permits outsiders to determine what is good for their countries, but it permits them to keep ignoring nationally generated development plans for the entire country. In an ironic reversal of roles, the battle is waged between national planners who are now viewed as "centralists," and expatriates, one who are considered the new "peripheralists."

Paradigms designed to encourage development in the proper countries in the contemporary would must take into account that a NIEO cannot be effective, unless it deals with the problems of the "poorest of poor," and that an attempt to deal with the "Poorest of the poor" cannot succeed, unless the demands for a NIEO are understood and placed in perspective. This is more than a case of dialectical unity of opposites; it is a recognition of the realities of a global society that is struggling to emerge. Therefore, both expatriate and national planners must consider and be cognizant of three distinct, but related, levels of reality: a global dimension with its own demands, rules and givens; the nation-state structure with its own historical logic, interests and capabilities; and the village level which, while poorer and more dependent is the arena where most people live, and where more people suffer as a result of decisions made on the higher levels. If there are objections to the hierarchial nature implied in this analysis, it must be pointed out that funds for development, theories about development, and most developers, belong to the global arena, less to the nation-state, and even lesser still to the poor villages. This does not, and should not, mean that the poor villagers ought to be ignored in planning, since they cannot be ignored when plans are executed. It only means that their position in the scheme of things be clearly recognized, and understood, rather than made the subject of a demagoguery that is counter-productive to everyone.

For example, the world community as an emerging entity is becoming more important everyday, even though it is often only reacting to events that occur on the level of the nation-state and the villages. Thus the decisions made by such international bodies as UNCTAD, FAO (Food and Agricultural Organization of the United Nations), the World Bank, and the World Food Council, to institute programs aiding the poorest of the poor were the result of data collected in the poor villages, aggregated on the level of the nation-states, and presented to the world community. This does not suggest that the villagers were ignorant of not having enough to eat, enough to wear, and enough of the wherewithal

to house themselves, heal themselves and to educate their children (a caveat here is that the notion of "poverty" is often culturally defined, and "poor" people may not conceive of themselves as "poor"). It only means that by themselves, the poorest of the poor fo not have the resources to deal with their condition.

It is a fact that the Sahel had been the victim of repeated and perhaps cyclical droughts in the past, but this is the first time in history that the world community was seized with the issue. No one knows if, or how the ancient Sahelian kingdoms and empires, as contrasted to the villagers, reacted to droughts and famines. The French Colonial regime sometimes attempted to ameliorate the effects of this scourge, but at least on one occasion, the Catholic missionaries had to threaten to expose the suffering of the Sahelians before the administration would take any action. There is some evidence that the present independent African states in the region hesitated to publicize the drought, because they were initially unsure of the facts, and later because they feared that such a calamity would call into question their ability to take care of their citizens. As a matter of fact, once the world community was seized with the news of the drought, it reacted so massively that the fragile and undeveloped institutional structures of the African states could not cope with the attempt of outsiders to help. Then when the Sahelian states mobilized, created CILSS (Comite Inter-etats de Lutte contre la Secheresse dans le Sahel), and attempted to use this instrument as a way of obtaining funds to deal with the overall development problems of the region, they discovered that the United Nations, and the World Community, working through such organizations as Le Club des Amis du Sahel had their own agenda that conditioned what funds were to be made available, and what avenues to explore.(21)

The way in which the global community attempted to deal with the Sahelian drought highlights one of the facts of development in the contemporary world. The world community has its own agenda; and the other levels, the nation-states, and the poor villages have theirs also.

The United Nations working through such international agencies as the World Bank, UNCTAD, and UNDP is attempting to get as much money for development as possible. Its efforts are conditioned by its dependence upon sovereign states for contributions. With its limited resources, the United Nations attempts to walk a thin line between the often conflicting theories, demands, and programs of its own bureaucracy, and those of the different nation-states. Many of the latter are jealous of their sovereign prerogative, and the

smaller ones are quick to note when the U.N. agencies are following the dictates, or rather the suggestions, or goals of the major powers, at the expense of the smaller nations. However, the United Nations and other global development agencies have their own structures through which they mediate development programs. Inevitably, these programs reflect the major concerns of these world bodies.

The poorer developing nation-states, such as those in the Sahel, attempt to put their own development plans into operation in so far as they can obtain the funds to do so. One of the major complaints of the ministries of development in these states is that not only must they rely upon expatriate technicians working in their development agencies to develop plans (thus making these plans Eurocentric), but that the major aid donors pay absolutely no attention to these plans.

Official surveys only partly bear out the contention of the Sahelians that they have always concentrated on the poorest of the poor. A survey of the economics of Mauritania, Niger, Senegal, and Upper Volta, by the International Monetary Fund (IMF) published in 1970, reveals that as soon as these states became independent, they elaborated provisional plans whose objectives were "to undertake certain priority projects (in agriculture, manpower, health and administration) and to lay the foundation for further planning. In all countries, the intermediate plans covered only investment in the public sector, having no global targets of growth for all sectors of economy. During the period of intermediate plans, special efforts were also undertaken to strengthen the planning authorities and to improve the statistical basis for subsequent planning, especially for demographic data, agricultural survey, and social research."(22) As they gained some experience in planning, all of these countries quickly formulated "second generation" plans such as the five Four-year Plans of Mauritania, Niger, Senegal and Upper Volta. They did so with the participation of representatives from the executive and legislative branches of the government, and with help and guidance from chambers of commerce, trade unions, business firms, and youth and labor organizations. The IMF found that the general object of these plans was "the achievement of economic independence and the raising of living standards and welfare for the population over a relatively short period of time (e.g., to double per capita income in 10 to 20 years -- the target growth rate in G.D.P. ranged from 4 percent in Upper Volta to 9.2 percent in Mauritania). The planners aimed at: (1) elimination of regional economic discrepancies; (2) structural changes in the economy; (3) diversification of the agricultural sector; (4) creation of import-substitute

industries; (5) orientation and training of technicians; and (6) setting the stage for further growth in the long terms."(23)

The Voltaics for example, among other Sahelians, have found it necessary to devote a great deal of their resources to road building in order to get to the poorest of the poor, they have had difficulty obtianing funds to do so from donors some of whom did not view these "national" projects as being especially related to the poor. During the period, 1966-1969, a number of consultant teams from prospective donor countries attempted to ascertain whether it was feasible to finance the building of roads to evacuate vegetable products, by counting the number of trucks passing over roads during a given period. What these persons did not realize, was that the roads were so bad that unless trucks were hauling gold or equally valuable products, it would not have been profitable for truckers to go into the region.

Any paradigm developed for aiding the poorest of the poor must be realistic about the conditions of the poor, and the nature of the poor. One of the major challenges for the people in the world's poor villages is their isolation from the life of their nation-states. This is especially true in the Sahel, given its large surface area and the relative lack of roads and other means of communication.

Those who would plan to help the people in Sahelian villages must take into consideration the need to expend money to reach these people physically.

Development planners must accept the strong possibility that the traditional institutions in the rural Sahelian villages are still viable and still functional. They must understand and appreciate the efficacy and resiliency of these institutions, which can be defined as highly patterned behavioral activities of human groups living in and exploiting specific environments, and which are valued by their possessors, because they have usually stood the test of time, and have proven their worth. Having emerged as a result of a dynamic interaction between human beings and their environment, these institutions are often regarded by people as the soel basis of social life. Sustained by technical paraphernalia, ideological charters, and making use of specialized vocabularies and symbols, these institutions permit people to cooperate with each other, and to maintain their socio-cultural and biological continuity. But as indicated above, although hallowed by time and function, these institutions do change, and as we have seen (within the case studies) those of the Sahelian populations have indeed already changed. Nevertheless, they continue to have meaning, and attempts on the part

of outsiders to change them without considering their utility, could result in a form of socio-cultural and often real death.

Yet, respect for the traditional institutions of people living in the camps, hamlets and villages in the Sahel does not mean, and should not mean, that planners should refrain from introducing change. Change in these communities is inevitable, if only because the nation-states of which these are a part, and the global complex to which their nation-states belong are also changing. To remain unchanged is to be retrogressive in a world in constant evolution. Planners must attempt to harmonize their development plans with the rhythm of life in the villages where possible, and depend upon the accelerated pace of life on the level of the nation-states to speed up changes in the rural areas.

The question as to whether development planners, both national and expatriate, should foster total change, or settle for incremental change is usually a moot one. Except when faced with natural or man-made catastrophies, human societies normally resist change. It often takes the imminence of physical death to induce people to abandon doomed communities, and then they frequently jeopardize their chances of survival by moving too slowly or symbolically looking back.

Development planners should be aware that the heightened concern of persons on the global level for helping people in the poor village and camps is in itself creating an environment for accelerated change. Human beings have always experimented with their environment both natural and socio-cultural. Tinkering is universal, both in biological organisms, and socio-cultural ones. It is always heightened by changes in the environment. But whereas nature is very ruthless with mutations that are not well adopted, socio-cultural innovations are not so easily destroyed. Planners can take advantage of socio-cultural mutations brought about by a more receptive climate for change by deliberately looking for them, and in aiding their development when they do appear. For, in contrast to innovations brought in from the outside, and which may not find a suitable environment, those which emerge internally have already managed to cope with the environment, and may well be better adapted to their environment than any other.

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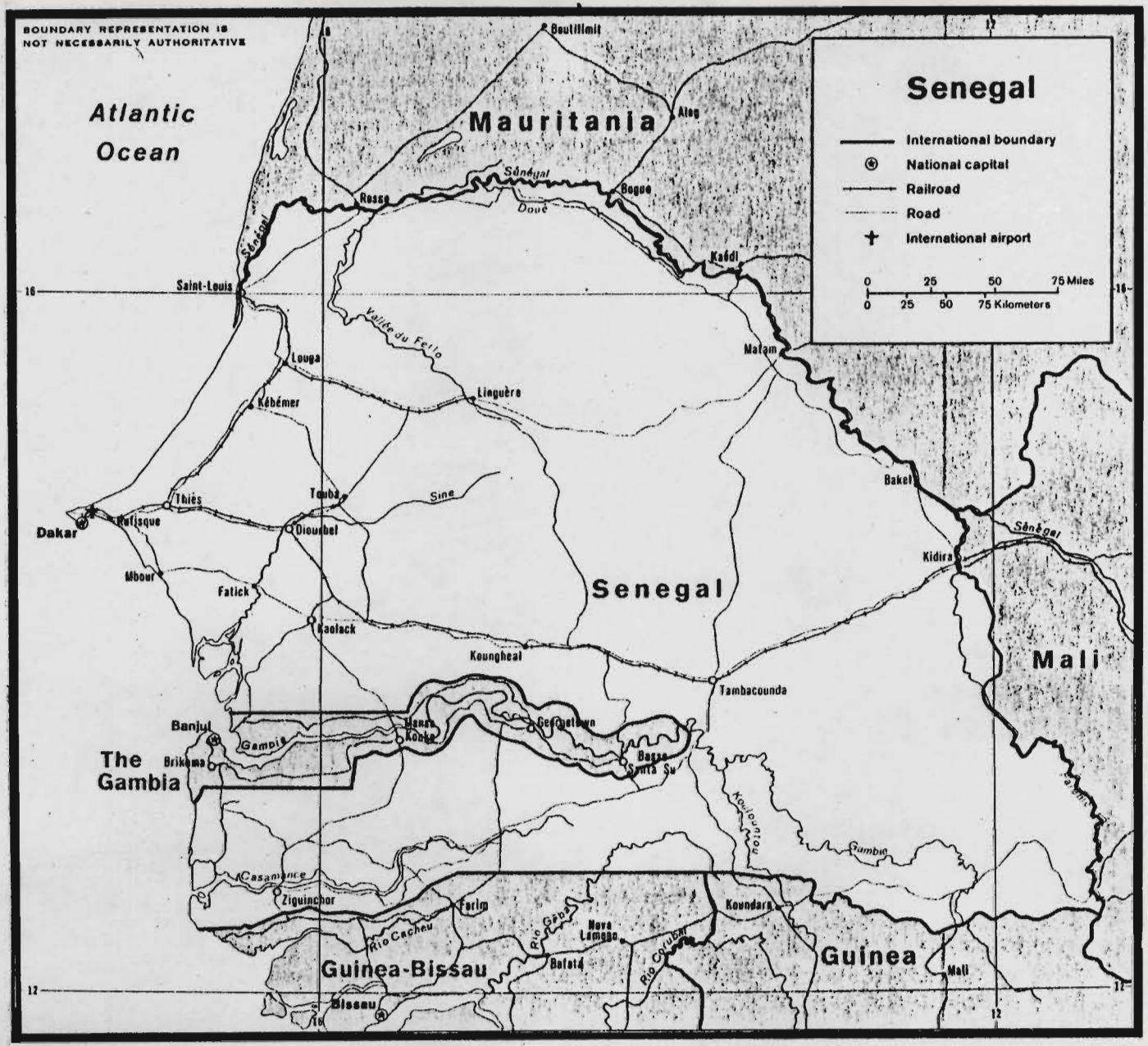
APPENDIX A

MAPS



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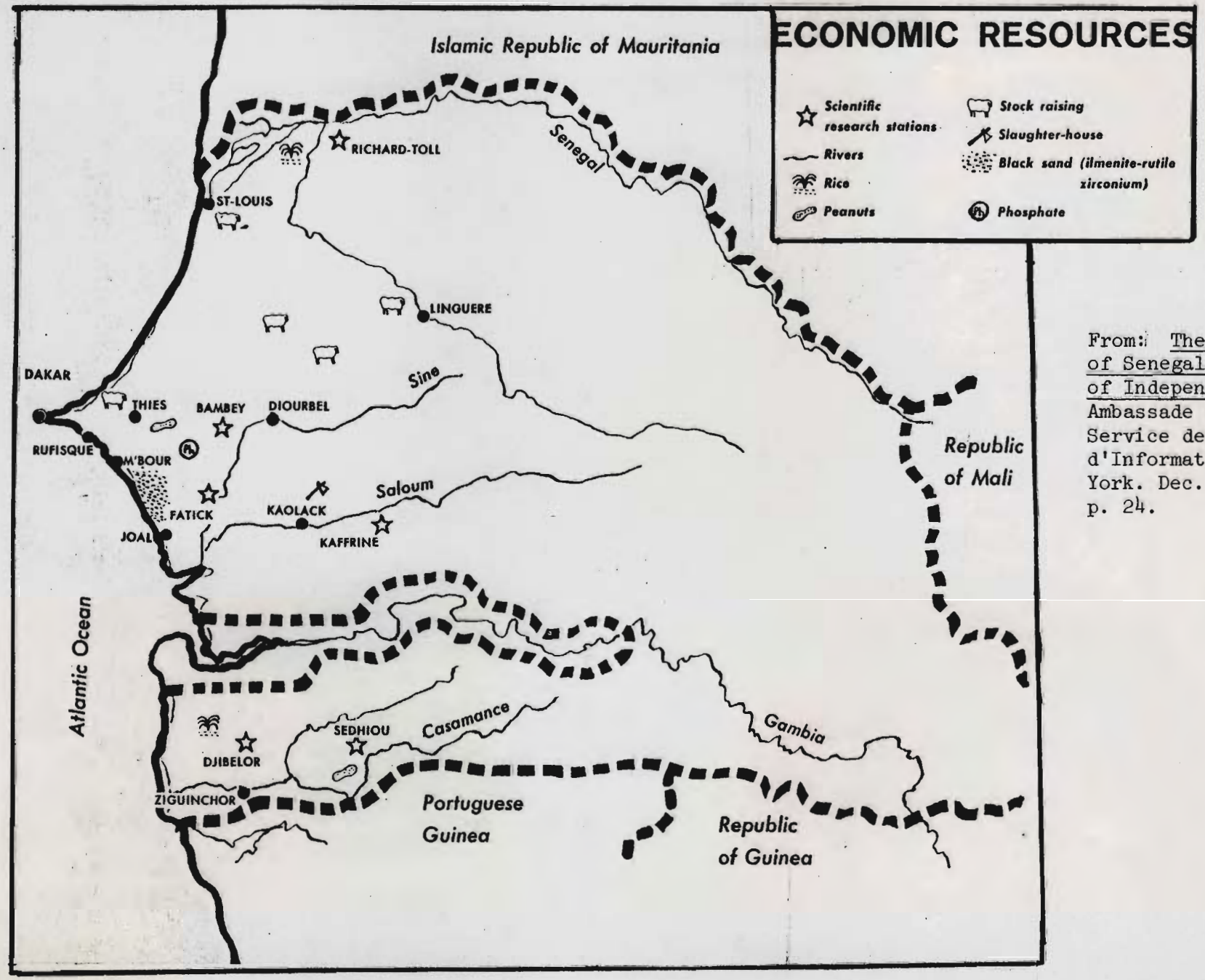

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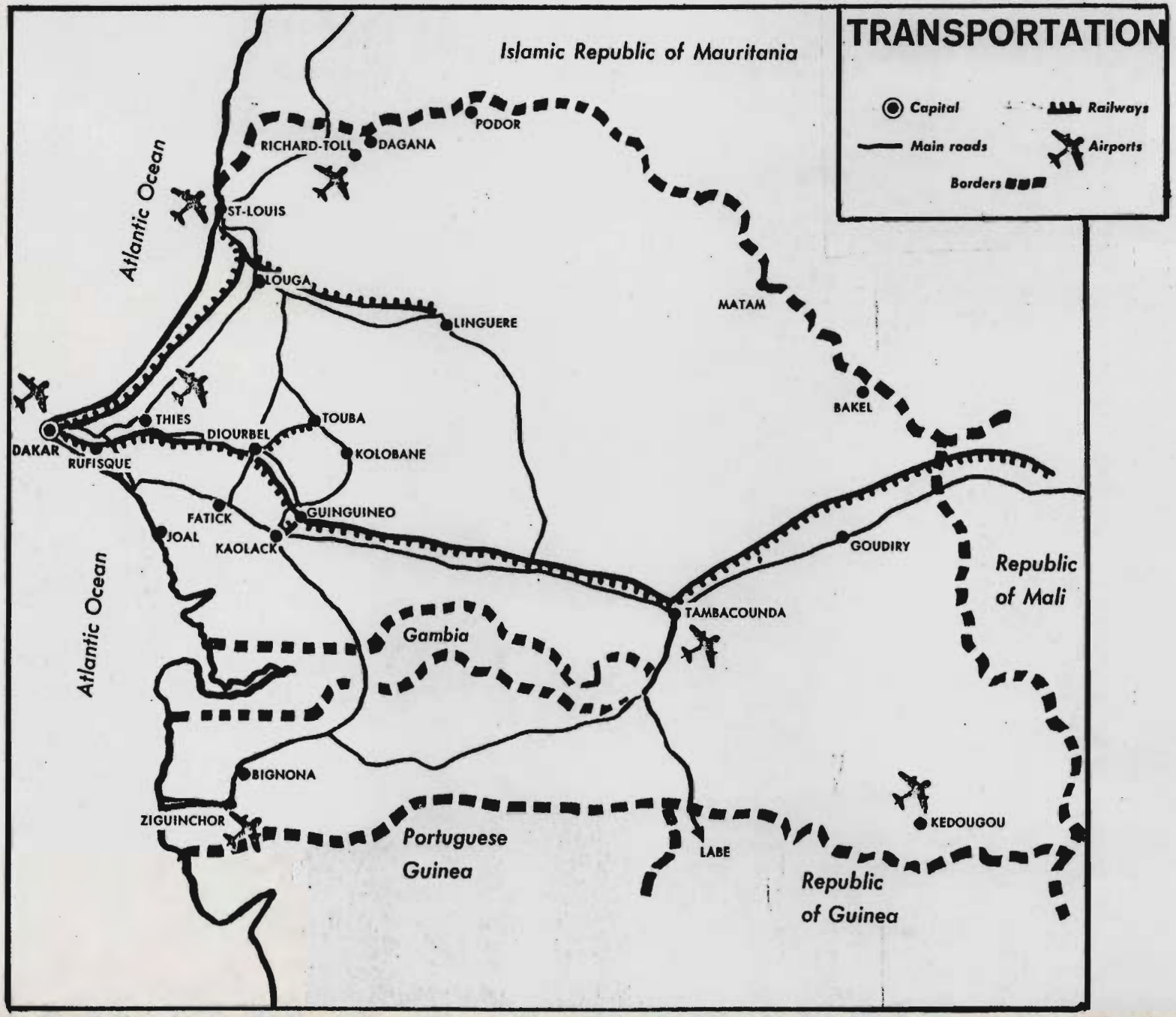
TRANSPORTATION
Capital
Railways
Main roads
Airports
Borders
Islamic Republic of Mauritania
Atlantic Ocean
Atlantic Ocean
PODOR
RICHARD-TOLL
DAGANA
ST-LOUIS
LOUGA
LINGUERE
MATAM
BAKEL
THIES
TOUBA
DIOURBEL
DAKAR
RUFISQUE
KOLOBANE
FATICK
GUINGUINEO
JOAL
KAOLACK
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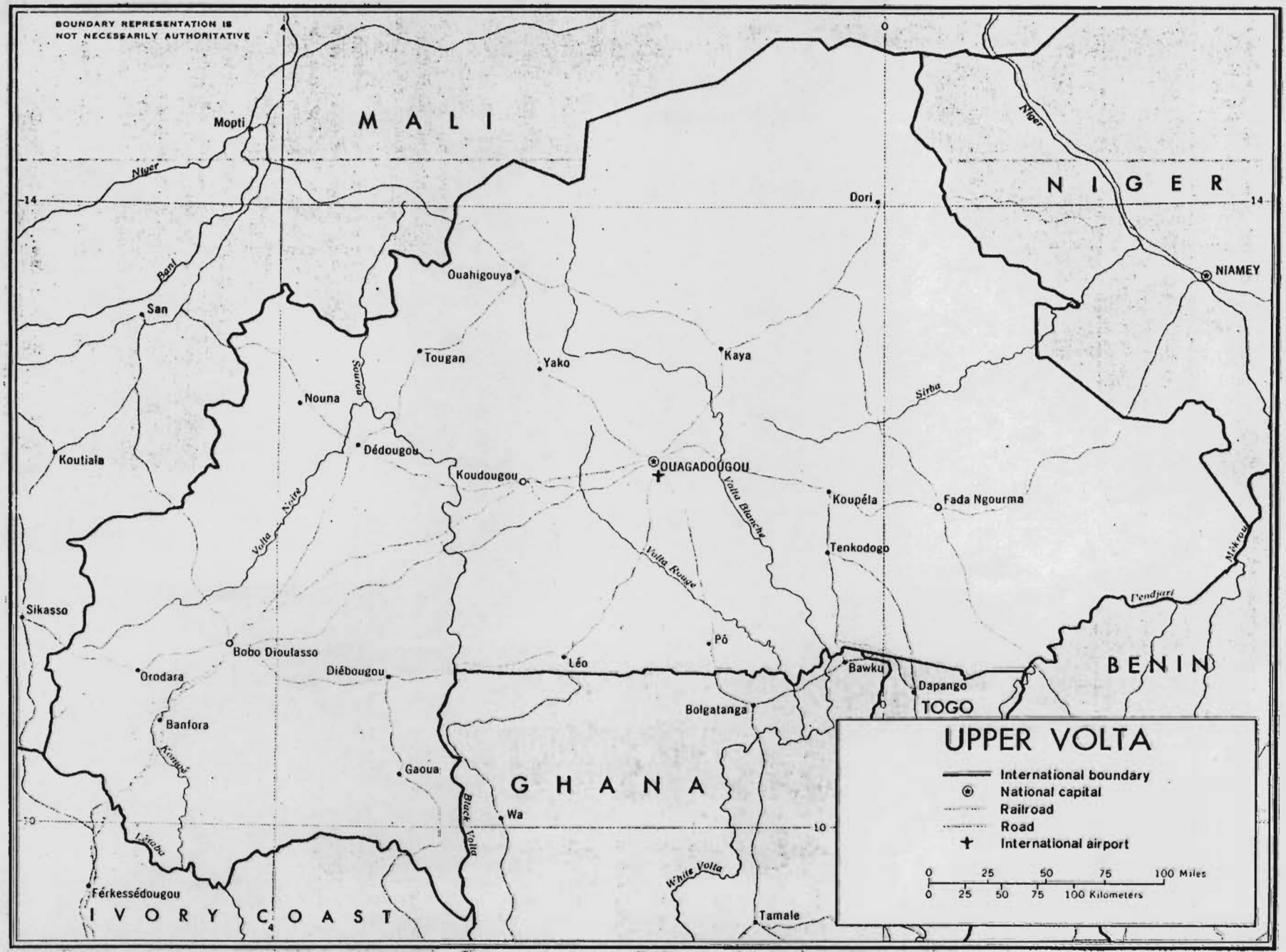
BIGNONA
ZIGUINCHOR
Portuguese Guinea
KEDOUGOU
LABE
Republic of Guinea



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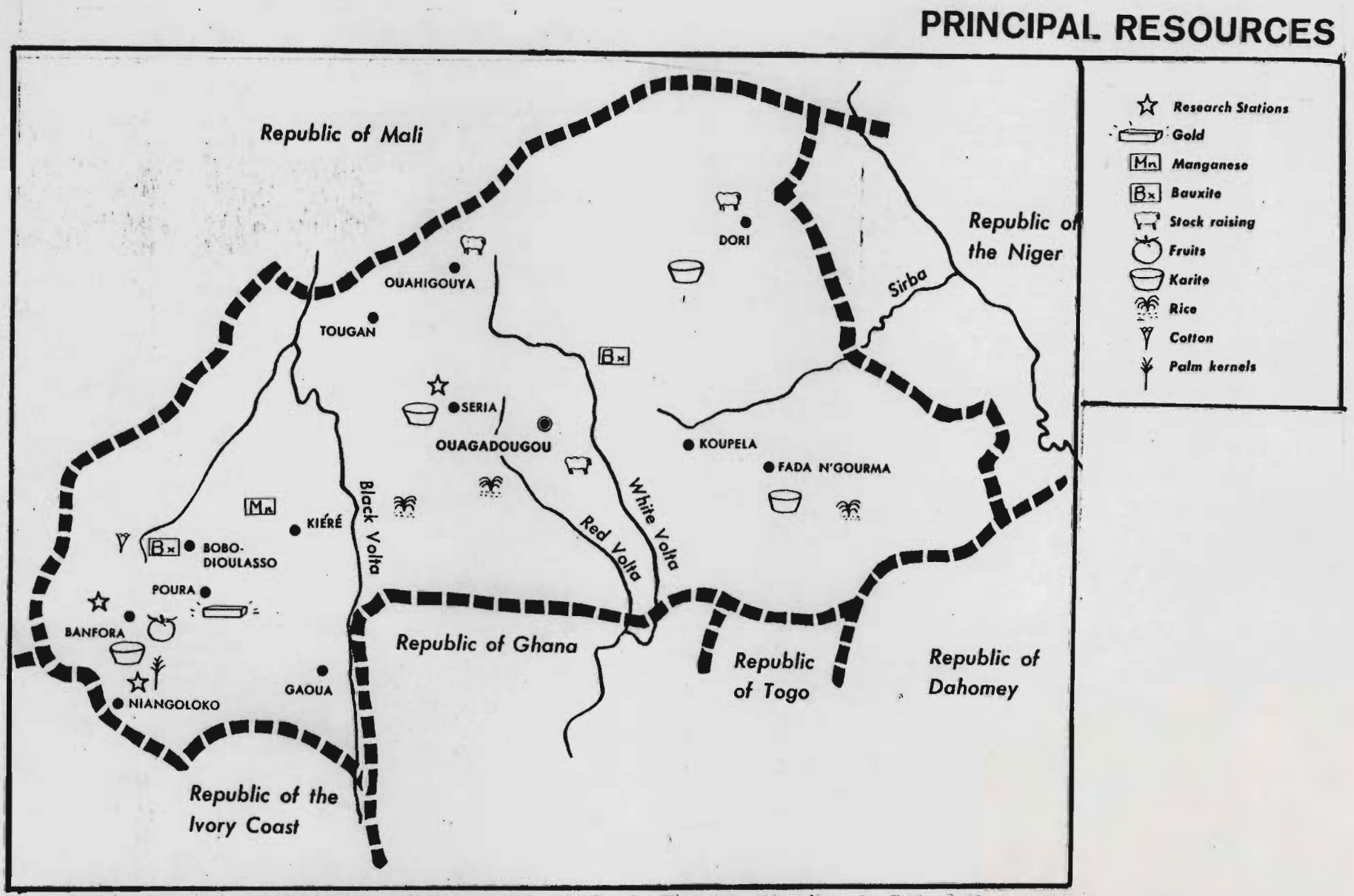

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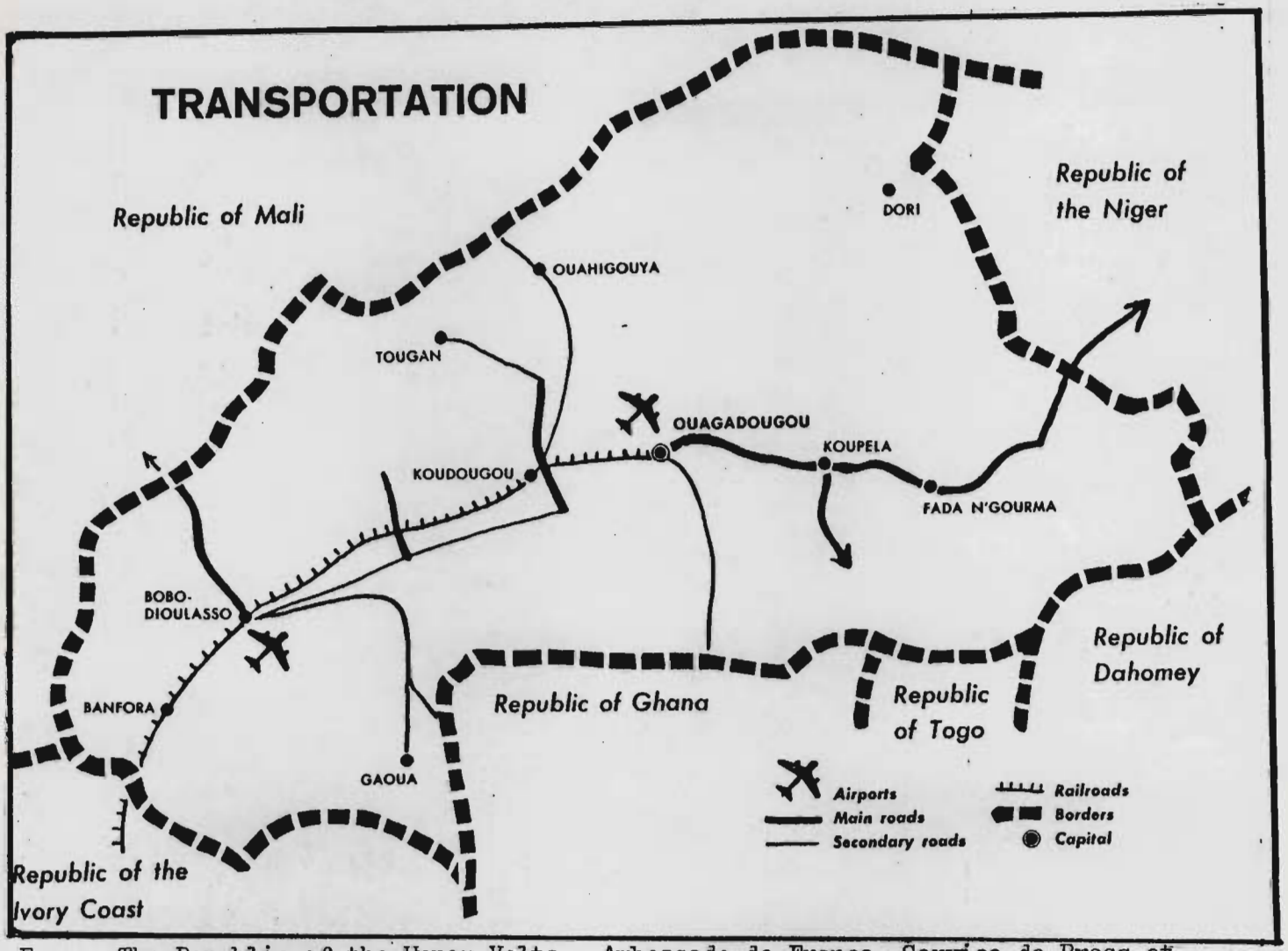

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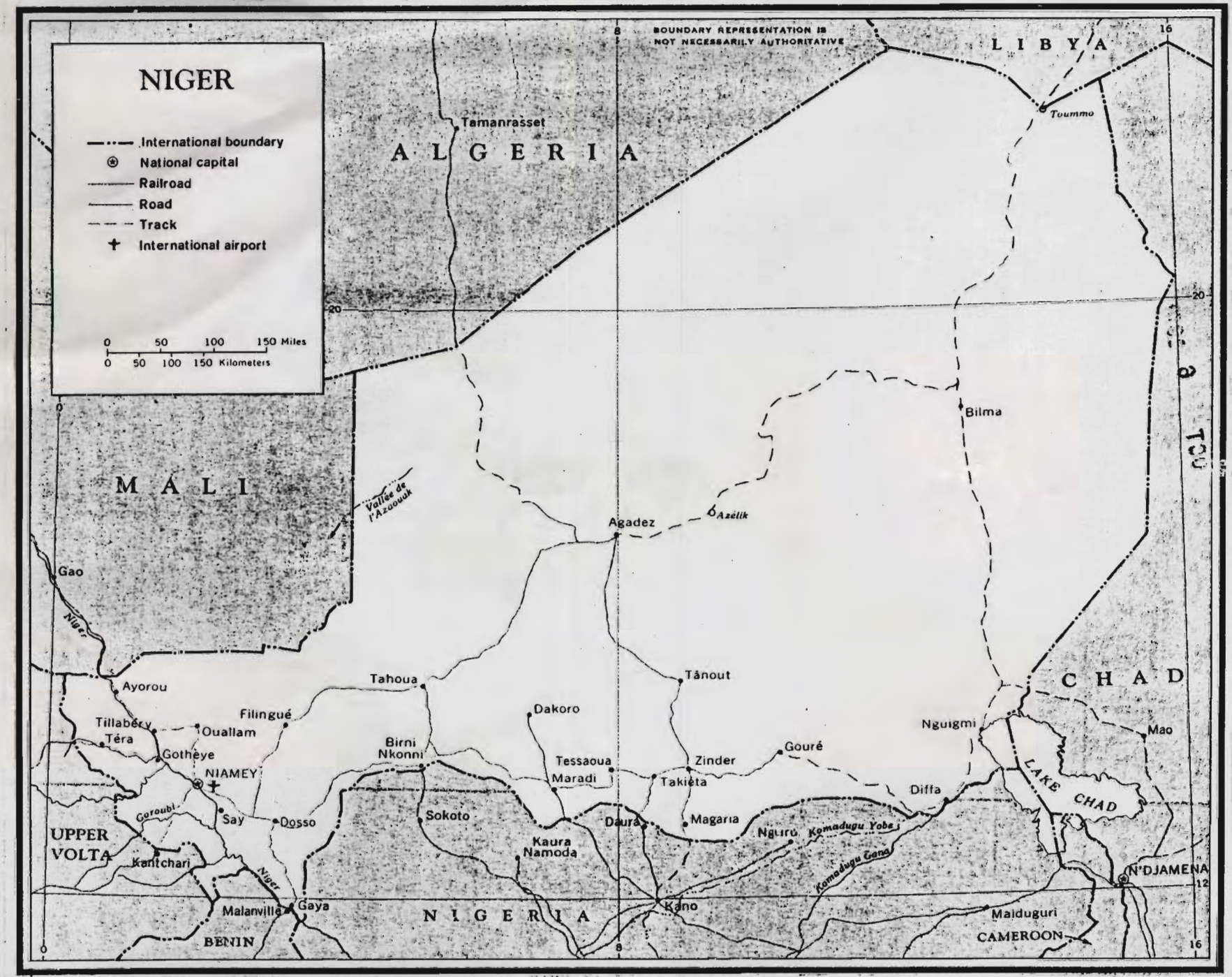

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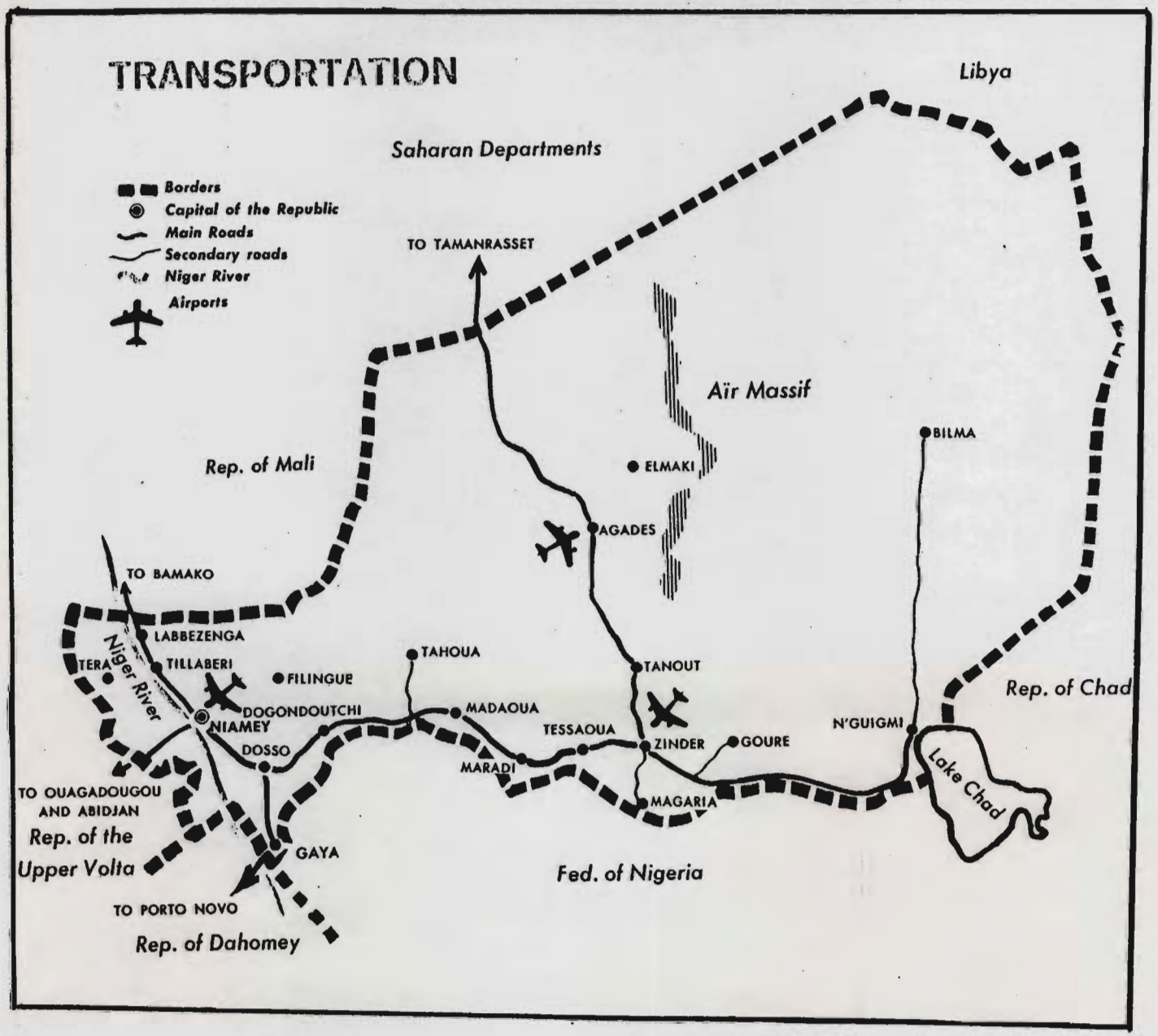
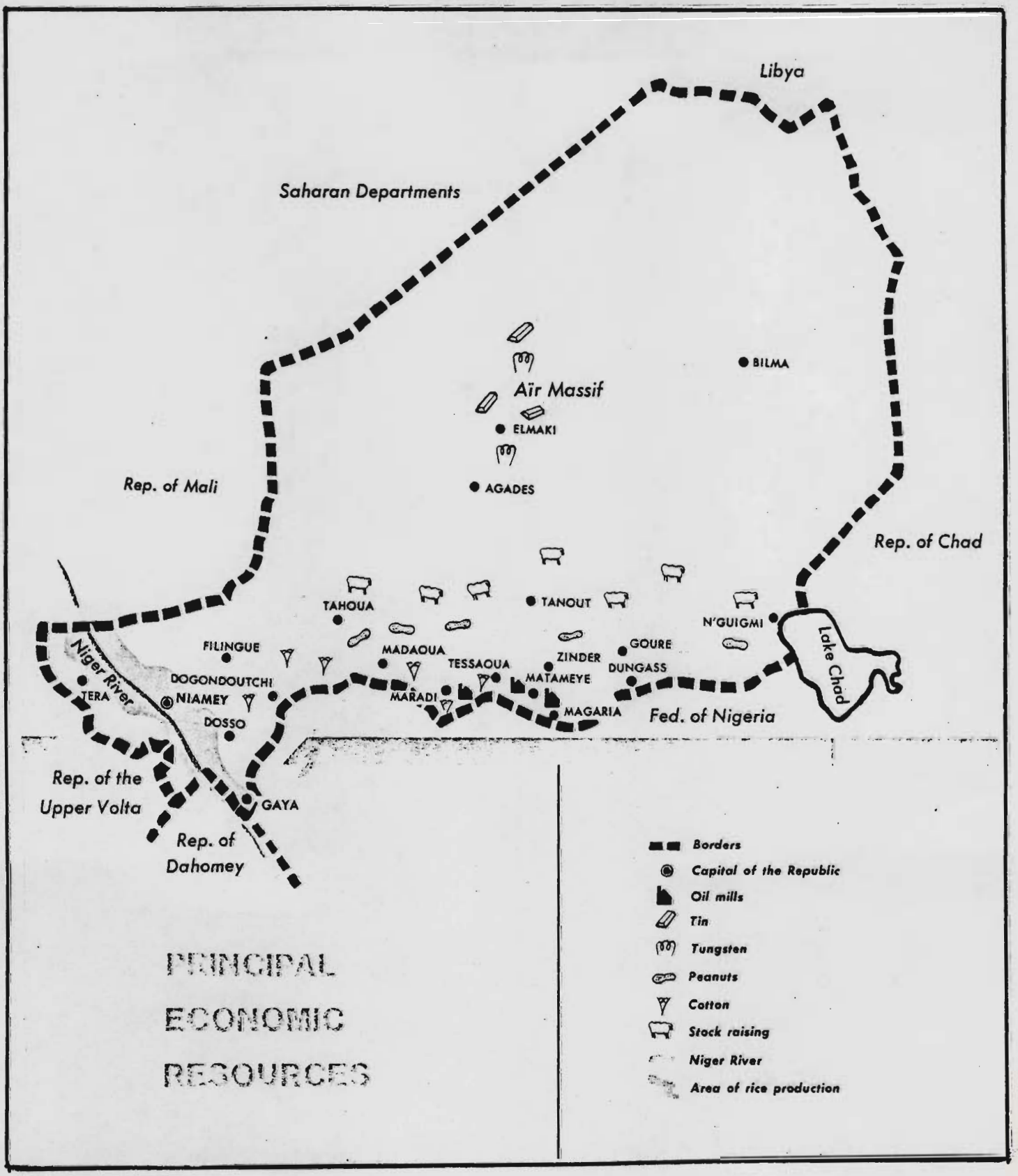

TRANSPORTATION
Libya
Saharan Departments
Borders
Capital of the Republic
Main Roads
Secondary roads
Niger River
Airports
TO TAMANRASSET
Aïr Massif
BILMA
Rep. of Mali
ELMAKI
AGADES
TO BAMAKO
LABBEZENGA
TERA
TILLABERI
Niger River
FILINGUE
TAHOUA
TANOUT
Rep. of Chad
DOGONDOUTCHI
NIAMEY
MADAOUA
TESSAOUA
N'GUIGMI
ZINDER
GOURE
DOSSO
MARADI
Lake Chad
TO OUAGADOUGOU
AND ABIDJAN
Rep. of the
Upper Volta
MAGARIA
GAYA
Fed. of Nigeria
TO PORTO NOVO
Rep. of Dahomey


Libya
Saharan Departments
Aïr Massif
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Rep. of Mali
Rep. of Chad
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Lake Chad
FILINGUE
MADAOUA
TESSAOUA
ZINDER
GOURE
DUNGASS
MATAMEYE
MARADI
MAGARIA
Fed. of Nigeria
Niger River
TERA
DOGONDOUTCHI
NIAMEY
DOSSO
Rep. of the Upper Volta
GAYA
Rep. of Dahomey
PRINCIPAL ECONOMIC RESOURCES
Borders
Capital of the Republic
Oil mills
Tin
Tungsten
Peanuts
Cotton
Stock raising
Niger River
Area of rice production

APPENDIX B

FIRST INTERIM REPORT

SAHEL PROJECT

OF THE

AFRICAN-AMERICAN SCHOLARS COUNCIL

GRANT NO. AID/afr-1162

Dr. Elliott P. Skinner
Principal Investigator

The initial phase of this project has been successfully launched. It has as its main purpose the investigation of the adaptive strategies of agriculturalists, pastoral nomads, and urban migrants to drought conditions, so that they may be better assisted. Three of the four scheduled fieldworkers are on site in Senegal and Upper Volta, and a number of candidates are being interviewed, so that one can be chosen to go to Niger as a substitute for Ms. Lina Brock. Ms. Brock elected to return to Columbia University to finish her dissertation. The plan now is to discuss the Niger end of the project with Mr. Dioulde Laya and secure the approval of a number of candidates, so that one can go to the field by the end of August.

The two Americans in Senegal and the one in Upper Volta spent the first several months reviewing the literature on their respective areas, and learning the local languages, while wating for official permission to conduct field research. Ms. Theresa Ware from the University of Michigan, commuted between Dakar, Senegal and Diourbel, Senegal, in an effort to gain the confidence of the local inhabitants and to secure an African counterpart from SODEVA.

Mr. Tidiane Aw, the head of SODEVA has now placed Mr. Thierno Sow at the disposal of Ms. Ware. An attempt is being made to secure adequate funds for this man's assistance, since the budgetary allocation for him appears to be

insufficient. When Mr. Sow is finally brought on board, his line of communication will be through Mr. Aw to Mr. Adrien Senghor, the Minister of Rural Development.

Alfred Waldstein is presently surveying a number of villages in the Saint-Louis area for his study. His African counterpart is linked through Mr. Papa Cyr Diagne (Secretary-General of Societe d'Amenagement et d'Exploitation des Terrains du Delta et de la Vallee du Fleuve Senegal) to Mr. Cheikh Cissoko, Director-General of SAED and ultimately to Mr. Senghor. Here again final arrangements are to be made for paying the African counterpart an adequate salary.

Grace Hemmings who recently went to Upper Volta will be working in the Eastern ORD in the region of Bogande. Her study is being supervised by Mr. Marcel Poussi Ouedraogo, Director, Centre Voltaique de Recherche Scientifique, who will shortly provide her with an African counterpart. This person will report to Ouedraogo and through him to the Ministries of National Education and of Economic Development.

Of the three researchers, Theresa Ware has made the most progress, a fact attributable to her being longest in the field. She had done an excellent survey of the area of Diourbel in central Senegal and has identified the populations to be studied. Thus, it is only a matter of time before she begins to produce the kind of data that should prove of inestimable value to USAID-Senegal. (See Appendix I). Alfred Waldstein has surveyed a number of sites in the Saint-Louis

area, and has started to investigate the symbiotic relations between pastoral nomads and sedentary agriculturalists; the growing "proletarianization" of rural labor; and the development of the migrant communities which have established themselves around SAED installations. There is every indication that his work will be quite significant for USAID, and he has started to participate in conferences called to deal with the issues of drought and development. (See Appendix II). He recently attended a conference DRODAT (drought data) sponsored by the Institute de Recherches en Sciences Humaines from Niamey, the Environmental Training Program of IDEP, and the Geography Department of Clark University at Worcester, Massachusetts. Hopefully this type of interaction will enhance his work, and instruct his thinking about the issues involved. Grace Hemmings is still acquiring the necessary background about the role and function of the ORDs in the future economic development of the Upper Volta. She hopes to be on site before the agricultural season begins and before the rains make travel to that region difficult.

In summary then, three of the four researchers are on site; they have identified the areas where they plan to work; and the three types of populations that are to be the subject of their investigation. A bit more administrative work remains to be done to firm up the role and function of the African counterparts, and to establish lines of communication between both African and American research

with the ministries and with the local representatives of USAID. The next interim report should provide more detailed information about the findings of the project.

Adaptive Mechanisms and Behavioral Changes with Implications for Rehabilitation and Development Programs

APPENDIX I

This part of the research project is located in the region of Diourbel, department of Mbacke and arrondissement of N'Dame (see attached map). Diourbel is the administrative seat (one of seven in Senegal) for the region and this region is the largest or the second largest (depending on whose statistics one uses) producer of peanuts which account for eighty-five to ninety percent of Senegal's exports.

For the agricultural population of this project sites have been chosen in the arrondissement of N'Dame which is 117 1/2 miles (189.06 km) northeast of Dakar. There are 150 miles (241.35 km) of rail linking Mbacke and Dakar and 30 miles (48.27 km) of rail linking Touba and Diourbel (this is all the same rail line which goes to Mali). There are 40 miles (64.36 km) of paved road in the heart of the arrondissement and most of the villages are linked by dirt roads which are fairly passable, even during the rainy season. The main or national route from Dakar to N'Dame is excellent except during the rainy season when the section between Thies and Touba is so pocked with holes that a normal 2 1/2 hour drive from Dakar can take 4 hours. There are

157 villages in the arrondissement and a total population of 50,553: The Wolof are 83% or 41,959; the Peul are 19% or 583; the Serer are 1.5% or 758; and the Maures are .5% or 253. People are organized in individual households, large families rather than lineage groups--normally composed of a head of family, his wife or wives, children, and often members of the immediately preceding generation.

Three villages which were the hardest hit by the most recent drought will be the focus of inquiry. In addition to their having been highly affected by the drought these three villages were among the first villages created in the arrondissement between 1912-1914. I say that they are among the oldest because the oldest village in the arrondissement, Ngabu, along with La (see map), was a former canton or French administrative unit; but even before that, it was a thriving settled village during the period of the Wolof states before French colonization. Ngabu was part of the Baol client state and maintained itself through annual tribute payments from neighboring settlements and through pillage. When the French conquered the Wolof states the socio-economic and political structures underwent tremendous change and upheaval. The ruler of the independent state of Baol lost his power and warriors were forbidden to wage war against their neighbors--only the French had the right to take up arms--thus, Ngabu had to turn to another means of feeding itself. The people of Ngabu realigned themselves with the religious brotherhood, the

Mourides, who had begun the pioneer settlement of new lands for peanut cultivation. These pioneer lands which now include Touba were--prior to French colonization a pastoral area where the pastoral Peul brought their cattle to feed during the rainy season. Ngabu remains to this day habitated but it is no longer a large and thriving village. Its importance lies in its historical significance for the arrondissement. According to 1963-64 figures available at the arrondissement three villages selected, Darou Karim, Tindody, and Darou Rahmane II have 321, 536 and 326 inhabitants respectively. It is recognized that these figures are highly approximate and I include them only to provide some rough idea of the size of the agricultural population under inquiry. We are, however, very fortunate to be conducting this inquiry at this point in time because the government will undertake its first ever national census this April (see enclosed article from the daily newspaper, Le Soleil).

This arrondissement is very special in Senegal because it includes the religious headquarters of the Mourides who are the second largest Moslem brotherhood in Senegal. The organizational structure of the brotherhood under the leadership of a Khalife-General and a hierarchy of marabouts is such that they account for a substantial portion of total peanut production each year. N'Dame has six maraboutic estates with over 450 acres (162 hectares) under peanut cultivation and 22 estates with over 100 acres (40.5 hectares) under cultivation. These estates are worked by the followers or believers and are

not to be confused with the very small plots of land worked by the Wolof farmers who are also Mouride, but have a different structural relationship with the marabout than the believer or talibe. Each village in this arrondissement has its religious leader who is the spiritual head of the village and one must address oneself to the marabout or spiritual head of the village before one addresses oneself to the village chief: e.g., rural extension workers, researchers, government officials who have official business to conduct in the villages. The Mouride structure which is a patron-client structure is totally interwoven into the economic and political structure of peanut production in the arrondissement (the largest acreages under cultivation are marabotic and a number of marabouts have invested in the heavy trucks which move the peanuts from the zone to the peanut oil factories here and to the port for shipment). The present Mouride zone which is on the fringe of the Ferlo (the semi-desert of central Senegal) is densely populated with half the total population of Senegal on one-seventh of its surface area. Population density rises from 51 to the square mile in the north (Darou Mousty) to 102 in the south (Diourbel). The arrondissement has some 68 to the square mile. Estimates for the arrondissement in 1963-64 suggested that peanuts occupied some 70 to 80 percent of the total cultivated area and that the Mouride zone produces 3/5 of Senegal's peanuts.

The soil of this zone is of poor quality; it is light, sandy, and vulnerable to wind erosion. In N'Dame, specifically, the soil is sandy, poor in humus, and has no water retention power; but this soil is well adapted to peanut cultivation, and so is the climate. There are several varieties of peanuts under experimental cultivation (drought resistant varieties), but in this zone the one planted by practically all farmers has a cycle of 115-120 days which parallels the rainy season. There are two seasons: the dry season which extends from November to June and the rainy season which extends from July to October.

The other crops grown are for indigenous consumption; millet is the staple food crop which is rarely sold, though sometimes exchanged for milk and/or milk products with Peul pastoralists. Cassava or niebe beans are also grown for consumption and since the most recent drought manioc is being planted in larger quantities in many villages.

Although in recent years light machinery and chemical fertilizers have become part of the cultivation process, the techniques and equipment remain traditional. Sowing is usually done by hand, although a horse-drawn seed-spreader is sometimes used and a long-handled hoe is used to clear weeds. After the harvest the peanuts are left on the ground in piles to dry for three weeks, then short hoes and sticks are used to detach the shells from the plants by beating. The shells are then taken from the fields to the village where they are sieved with a

APPENDIX C

SECOND INTERIM REPORT

NEW ADAPTIVE SOCIAL MECHANISMS

GRANT NO. AID/afr - 1162

Dr. Elliott P. Skinner
Principal Investigator

The field researchers in Senegal have started to produce the kind of data that could provide the basis for significant new directions for the aid-giving and aid-receiving organizations in that country. The hope is that this report, when taken in conjunction with the verbal reports made to Ambassador Aggrey and Mr. Schoonover and the personnel of USAID in Dakar, would indicate in what manner USAID could be made more effective in Senegal.

The major findings of Ms. Theresa Ware (see Appendix I) is that the Fulani (Peuhl) of the Decvotte zone in the region of Louga are in full transition from pastoralism to what she has termed "agro-pastoralists." A preliminary reading of the detailed data she has produced does indicate that the Fulani of this area did indeed lose a large number of their animals during the drought, and that as one man declared, "We have no choice, except to farm to eat." Farming is thus seen as an unwelcome substitute for herding -- an observation that is very common among Fulani not only in Senegal but all over the Sahel. What Ms. Ware's data do show, however, is that despite this "ideology" of pastoralism, most of the Fulani are indeed farming, or <u>behaving</u> quite differently from their wishes. In other words, people

still have the ideology of pastoralism, but are deviating from this ideology in view of the reality of their present situation.

Another observation that can be drawn from Ms. Ware's data is that the Fulani have established a hierarchy among non-pastoral activities. Millet cultivation with its direct contribution of foodstuffs to the family is one of the first activities undertaken by the pastoralists. Indeed, it does appear that the Fulani in this region have always "put in" (in contrast to cultivating) "a little millet" since it demands little actual care, and does not interfere with their transhumance cycle. Under conditions brought on by the drought, many more persons are actually cultivating more millet, and this in fact is interfering with their customary pastoralist activities.

Peanut production comes after the cultivation of millet in the established hierarchy of the Fulani primarily because it is a non-subsistence export crop. People cultivate peanuts because they need cash for paying taxes, and for buying those goods they desire and do not produce. The difficulty is that peanuts require more care than millet, and are not congruent with the transhumance cycle. Ironically, these Fulani are adopting the cultivation of peanuts at the same time that many Wolof farmers are abandoning peanuts

as being unprofitable, and the Senegal government is attempting to diversify the economy from reliance on the monoculture of peanuts.

Trade comes next after peanut production as a preferred non-pastoralist occupation because it falls within the occupational niches of the Moors, and normally took people out of their transhumance cycle. Of interest is the new combination of trading animals and milk with the traditional transhumance cycle. The surplus of milk now available for sale may well indicate a growing self-sufficiency among the Fulani in millet -- a foodstuff which they formerly obtained in exchange for milk from farmers along their transhumance routes. The economic and social concommitants of this kind of trade, especially for the Fulani women, are especially interesting since here might be the mechanisms that could well link these people more closely to a money and therefore national economy.

Gum collecting is apparently losing its onus among the Fulani as a shameful occupation primarily engaged in by Moors. Here again, people are actually behaving in opposition to their ideology when the material factors dictate a change in their occupation.

While Ms. Ware did not belabor the point, it is quite clear the Fulani need help in order to master agricultural techniques. They need to know the right

time to sow their seeds so as to avoid multiple sowings, that is, when this is not due to unexpected drought conditions. They also need to learn how to protect their crops from insects and other pests. They also need various types of agricultural implements to aid them with their cultivation. In other words, it appears that the agricultural extension agents should be made aware of the emerging agricultural activities of the Fulani. They, too, should leave ideology aside, and go to the aid of people who possibly need more help in mastering agricultural techniques than the traditional cultivators.

One suspects that unless the government of Senegal is made aware of the emerging agro-pastoralism among the Fulani its national economic plans might ignore this new phenomenon, and may not be able to avoid the resulting conflict between groups struggling for the same ecological and economic niches. The solution may be as simple as providing "fencing" for both Fulani and Wolof or in recognizing that the Fulani can easily be transformed into effective farmers as the Wolof and other Senegalese. Ms. Ware's tentative conclusion should be underscored: "Each of the 'new' economic activities necessitates the interaction of the Peuhl with other ethnic groups, par-

ticularly the Wolof. Increased cultivation could draw them more into the orbit of or at least the fringes of the national agricultural modernization program. This, however, would present a serious confrontation between the patterns of work tasks among pastoralists and those among cultivators. The main vehicle, as they see it now, for allowing them to hedge against the further erosion of their way of life could, in and of itself, significantly alter their way of life."

In view of this statement, I would recommend that: agencies interested in improving the way of life of the local populations in the Djorobel region recognize the nature of the emerging agro-pastoralism among the Fulani and help this population to make this transition.

Despite his caveats, Mr. Waldstein's second quarterly report of his work in the Senegal River Delta is sufficiently detailed and supportive of his earlier observations that valuable recommendations for action can be drawn from it. Moreover, many of these recommendations appear to parallel those made with respect to Ms. Ware's report, although there is no evidence that these two fieldworkers saw each other's finding before they were presented to me.

The value of Waldstein's project is that he has a very good controlled situation in the form of three different communities engaged in the same activity:

Kassak Sud, a community composed of primarily veteran soldiers of the French army and drawn from the many regions of Senegal; Kassak Nord, a community of persons almost all of whom are ethnic Tukulor cultivators from the Fouta Toro; and Kassak Peulh (known also as Nadiel), a community of pastoralists indigenous to the region. All three communities are engaged in a project developed by SAED (Societe d'Amenagement et Exploitation des Terres du Delta et de la Vallee du Fleuve Senegal) and having as its goal to help the country become self-sufficient in both rice and tomatoes. The hope is that this delta region which was of marginal use because of its salinity, once irrigated and settled by people affected by the drought would help Senegal break out of the pattern of monoculture, based on peanuts, and would provide rice and tomato paste, both for local consumption and for export.

SAED appears to be in the process of overcoming some of the technical and sociological problems that have plagued previous attempts to develop and to exploit the Delta region of the Senegal basin. Despite some local problems, most of the secondary irrigation systems have been laid down, and the task now is to complete the tertiary ones. More difficult to resolve may be the sociological ones posed by the populations involved in this scheme. Hopefully this field project,

in addition to other studies will sensitize the Senegalese authority to the problems of the peasants involved and aid in resolving these issues which may hinder the realization of the plans of the government.

The major problem identified by the fieldworker is that there is a wide difference in goals sought by SAED and by its clients. In Kassak Sud, SAED appears to have underestimated the need of the people in this community to maximize their earnings in the face of the complex bureaucracy, and the needs of the Senegalese nation-state. Not only are the farmers still completely dependent upon SAED, but they fear that this dependence is detrimental to their future. The peasants now depend upon SAED for the delivery of seeds, fertilizers, weed-killers, transport, marketing and so on, and being not sufficiently informed about the total financial situation, they have gotten into difficulties with their host over the sale value of tomatoes. The result has been the threat to refuse to plant tomatoes next year, an act that would jeopardize the government's arrangements with European buyers. Waldstein's conclusion is that only a greater degree of economic autonomy would help the peasants. He declares: "They know that, for all their good will, SAED personnel are not peasant farmers and are not pursuing the same interests as peasant farmers. The

farmers do not, therefore, have complete confidence in SAED personnel and they can cite specific case to buttress their mistrust."

The problems identified by the fieldworker in Kassak du Nord are more complex. Not only is there greater salinity in this area, but the cultivators here tend to use their lands as hedges against conditions in their original home areas. There is a great deal of circulation between the two regions, with farmers only planting those crops in Kassak Nord that are most profitable to them. In many cases they do not meet the target expected by SAED. At the same time, these "migrant" farmers are reluctant to furnish the information about Delta land use because they fear they might be extruded from their plots. Unless more attention is given to the reasons for this "hedging," it might be difficult for SAED to sedentarize these agricultural migrants, and thus fulfill its mandate.

The case of Kassak Peuhl has so many points in common with that of the Peulhs of Louga studied by Ms. Ware that one begins to wonder whether the culture of most Peuhl groups in Senegal is indeed changing. At first reluctant to have their ancestral lands (which, while marginal to agricultural use, was ecologically useful

to them) irrigated and parcelled out to cultivators, the Fulani have been steadily becoming agro-pastoralists. They follow the advice of the agricultural extension agents and even need and want more land upon which to cultivate. Moreover, they are successfully mixing pastoralism with cultivation. They are now more conscious of the "economic" use of their herds and are clamouring for an outlet for their surplus milk. Yet, they do not seem to have mastered the technique of preventing their animals from destroying the cultivation of their agricultural neighbors. The result has been conflict. It may well be that fencing is a desideratum here, as it is in Louga, and a way of avoiding ethnic conflict among groups attempting to exploit the same ecological niche.

In all three communities there is the need to deal more effectively with sociological problems stemming from the technical innovations emanating from the project. The inability of women to reap benefits for their agricultural work and their economic rewards limited to what they get from vegetable gardening, is apparently posing a marital problem for many families. Significantly, the women sections of cooperatives and community organizations were immune to the splits that plagued the more economically involved men's sections. It should be noted also that despite the split in the

cooperative in Kassak Sud, the Council of Notables which handled problems in the traditional sector, maintained its unity. What this does suggest is that where traditional organizations get too much involved in the modern economic sector, they lose their basis of social cohesion. This being the case, should developers ever attempt to build on traditional institutions? If they do wish to use these institutions, then what safeguards must and should be taken to replace the traditional charter on which groups cohered to more modern charters? Unless this is done, then it might be impossible to adapt traditional organizations to contemporary needs in the modern world.

Waldstein recommends that SAED should be more aware of the peasants' need to hedge their bets by attempting many new strategies, by cultivating many more types of crops in order to maximize their earnings. He is also convinced that unless the peasants are given greater autonomy, the project would not realize its full potential. It might well be that no African government can place farmers at the mercy of the "free market," yet SAED may be able to provide them with larger parameters within which they can experiment with their future.

In summing up his findings to date, Waldstein comes to the interesting conclusion -- and one that is

implicit in Ware's report -- that the Sahelian drought may not have elicited as many innovative strategies as it "intensified the reliance on alternative strategies already in existence." If indeed this turns out to be the case, then the original hypothesis upon which this project was based will have to be modified. One may suggest that what disasters do is to force people to take a harder look at their environment, and maximize those features that may have the greatest potential for development. The corresponding role of the developer would be to help them move successfully into the new activities that they have identified and attempt to implement.

Grace Hemmings has just arrived at her field site in the northeastern region of Upper Volta and as a result has not had much to report. Like the other researchers in Senegal, she will be working on pastoral, agricultural and migratory populations. One startling fact in her first report is that the people in the region being studied assert that, while the drought began as early as 1964, "1974-1975 was considered the worst year. Fifty percent of the crops were lost. The largest losses were reported in millet, the staple crop." What this indicates is that despite the general feeling in the U.S. and in parts of West Africa that the drought is just about over, some Sahelian areas are

apparently still suffering from that scourge. People are still migrating as a result of the drought, and are still experimenting with different planting schedules in order to take advantage of what may be a shifting rainfall pattern.

One unforeseen consequence of Ms. Hemmings' late start, and that of John Sutter who has only now arrived in Niger, is that they may provide longitudinal data that will make this project a more valuable one. It might be interesting to discover whether the kind of evidence now being provided by Ware and Waldstein from Senegal will be replicated in the more eastern Sahel zone.

An unforeseen benefit of the Sahelian project to USAID is the help that many of the fieldworkers are providing to those short-term contractors who visit West Africa to do feasibility studies on behalf of the agency. My hope is that these beneficiaries of advice by these young people in the Sahelian project acknowledge their help when presenting their reports to USAID.

APPENDIX D

THIRD INTERIM REPORT

REPORT ON A TRIP TO THE SAHEL

GRANT NO. AID/afr - 1162

Dr. Elliott P. Skinner
Principal Investigator

On June 3rd I left the United States for Dakar and was met at the airport by Mr. Allan Davis, the Deputy Chief of Mission, representing the Ambassador. I had a luncheon at Mr. Davis' house and while there met a number of younger members of the various ministries in Senegal. Our conversation ranged widely from the politics of the Sahelian states to the forthcoming American election and of course race relations in the United States. I later met with both Alfred Waldstein and Theresa Ware and discussed certain financial and theoretical matters concerning their field project in Senegal. The major problem facing the two field workers was obtaining official permission to conduct their field work. Through the intermediaries of the ambassador, certain Senegalese officials and the AID mission, Alfred Waldstein was able to establish relations with SAED in the St. Louis area of Senegal and Theresa had formed a working relationship with SODEVA in the Djorobel region of Central Senegal. Both these field workers had already been in the field and had already started to collect data, but in the absence of certain letters from the ministries, they could not allocate funds to their counterparts.

The question of counterpart is a very difficult one to resolve, owing to the relative lack of Senegalese with credentials comparable to that of both Waldstein and Theresa

who could work with them. Most Senegalese with that degree of training are already employed by either the government or the private sector and are therefore not available for a one-year contract. The result has been that the two parastatal organizations, SAED and SODEVA, had opted to place their own functionaries at the disposal of the Sahel project. They had agreed to do so since they are interested in the project and in the findings. The issue was to find some mechanism by which these African persons could receive money from the Sahel project. My task was to meet the various ministers and their directors of cabinets in order to work out a formula. This was done. I met the head of SODEVA but did not meet the head of SAED since he was out of town. I did meet many of the lower echelon people in both SAED and SODEVA and received from the ministry a letter granting permission. A copy of this letter is appended to this report.

While awaiting the arrival of Mrs. Brewton to resolve a number of administrative problems, I traveled north into the St. Louis area with Alfred Waldstein. The voyage north was interesting in that I had a chance to quiz Waldstein at length about his field work and to answer many theoretical and practical problems that he had.

The next morning we went to the Kasai area in which he worked and visited a number of populations. We spoke to the sedentary population in the St. Louis rice-

cultivating project and visited two groups of farmers. While there, we were able to make a number of observations. Both populations are involved in rice and tomato growing projects organized by the Senegalese government and directed locally by SAED. The problems they are having are mainly technical in that the irrigation system or systems(three in number), had not worked out too well, and the salinity of the land has prevented the production of as much rice and tomatoes as had been expected.

We discovered also that the local people, faced by the severe technical and ecological problems of the area, have been hadgeing their bets. They have been cultivating gardens, both in an area adjacent to the rice scheme and have been traveling to their home areas to cultivate gardens there. The idea is to have a source of income from these gardens in the event that the govenment sponsored activities do not bring in the expected income. For example, the people in one area (the Toucolour), believe that the area is better suited for growing cotton, onions, and maize. Their problem is that the govenment does not know about these activities, and they are concerned that if they tell the government about them, the government would not approve of them. The government's ouw agenda is to grow rice and tomatoes. The problem for the local people who are actually working the soil, is to see how they could maximize their profits, within the constraints accepted by the government. As of now, they don't seem to

be too enthusiastic about the government's project. The question then is what can be done?

When we reported to the Ambassador and to Mr. Fell, representing Mr. Schnover, we indicated that we had seen local attempts at adaptation. The problem is whether the people of USAID will be prepared to apprise the government of our findings and whether SAED will be willing to report that in some areas other types of crops other than rice and tomatoes might be better adapted to the local ecological system.

The other observation made with respect to the agricultural populations, was that they do not believe that their expectations are being fulfilled. They had expected to obtain a better harvest or greater rewards from their agricultural labor than they had received in their home regions. The result of this disappointment is a growing regret that they moved. There is also some indication that certain families are returning to their homelands. The chief of the Toucouleur and Waldstein reported a net reduction in the number of families available. The chief said that unless people were permitted to grow cotton and onions, they might well return to their own villages.

One positive fact is that persons who were previously primarily subsistence farmers now see the cultivation of crops as an important mechanism for gaining income. Thus

although they do not appear to be satisfied with the move from their rural villages up to the St. Louis project, they seem to have made the transition from subsistence cultivation to cultivating for money.

We also observed young people, urban trained, who faced with the inability of earning a living in Dakar or in St. Louis have returned to the farm. One young man in particular was functioning both as a cultivator and as a functionary. He was in charge of collecting demographic data and other types of information for SAED.

We also noticed that Senghor's political party was working at the grass roots level. What was not clear was whether this political action had an economic dimension or was primarily political in scope; in other words, whether its activities were directed to encouraging people to participate in the political system, or using the political system in order to get them to work as efficient agricultural laborers.

The pastoral population in the area, especially the Fulani, seem to have made a better adaptation to the project. Originally in the area, they had exploited land which while short of water, had enough grass for their cattle. Apparently they also cultivated millet and some rice and peanuts in the so-called "bottom lands;" that is, areas which for one reason or the other were wet and fertile. To these populations, then, the intervention

of the government to irrigate the very salty land was a godsend. Where previously they had no water, or very little, here they had water in abundance; and in contrast to the cultivators, these pastoralists have been excited about their opportunity to grow more crops. The Fulani are still basically pastoralists, however, and there is evidence that they are very much involved with their cattle. In fact, one of the things that we saw, and one of the problems in the area is that many Fulani herders are still pasturing their cattle in areas which had been brought under cultivation but contained some stubble after the crops were harvested. There is no objection on the part of the administrators to these herders using the stubble for cattle feed--their problem is that cows going through these areas damage the irrigation system. This means, therefore, that if a pattern of mixed farming is to be developed in this area, the irrigation system must be so devised as to prevent cattle from damaging it. I am not sure whether this can be done but this is certainly a problem to be looked into.

Of possibly more long-range interest is that the Fulani seem to be more interested in cultivating lands placed at their disposal than are the sedentary farmers--whether Toucouleur or from the Casamance. As a matter of fact, the Fulani have been complaining that they do not have as much land as they need. The idea here might be

that in this area at least, agriculture might well be better done by the Fulani than by the traditional sedentary farmer. (Here is a question of relative deprivation, something that many social scientists have long known about. It was, I think, the Army study of Stouffer that demonstrated that the relatively well taken care of airmen in the American Air Force, complained more bitterly about the lack of cigarettes than those "mud-slogging" infantrymen about not having rubbers and warm clothing even in the dead of winter.) Waldstein should take a further look at the situation to see what should or could be done. So much then for work in the St. Louis region.

I traveled with Theresa Ware to the Diourbel-Touba region of Senegal. This is the area where the Mouride population or Mouride religious sect have been operating. Because of a very interesting juxtaposition of climate, peanuts and religious fervor, the people in the Djorobel-Touba region have been the greatest cultivators of peanuts in Senegal. They functioned efficiently during the colonial period and have continued to do so up to the present time. The problem for the government was how to get the Mouride people to extend their cultivation and to diversify their crops. As a result of the drought, the government of Senegal released to the Mourides several thousands of hectares of so-called forets classes, that is, an area which was reserved or placed in reserve. The object was to permit the Mourides, especially the Khalif of the

Mourides, to move into this area and provide the agricultural labor from among his followers. The government, working through SODEVA, a parastatal organization, would provide water for irrigation and agricultural extension agents.

The area that we saw outside Touba-Belel was relatively well watered, but the problem was that too large an area had been brought under cultivation. The result was that there was not enough people to cultivate the crops, with a corresponding decline in production. The other problem seems to have been a lack of attention given to the adaptability of certain crops to the environment. For example, white potatoes were introduced, but judging from the potatoes we saw the experiment was not a great success. The local people feel that they did learn one thing, and that was the fact that the region could produce potatoes. I did see some large potatoes and these were being gathered by the extension agent in the hope that they represented a local adaptation and if so, might be used as seed potatoes for future planting. What was surprising to me was that SODEVA did not establish contact with an agricultural station only about 30 kilometers away. Why this was not done, is a mystery and is probably related to local or political factors rather than technical ones.

In addition to this project, other cultivators in the

Diourbel region who have not been organized by SODEVA, have been planting vegetable gardens. Theresa Ware has been looking at these. She also discovered that many of the farmers have been fattening sheep and goats for sale. This is something that was done previously, but with different ends in view. Traditionally, many a farmer would take a sheep into his household, feed it on scraps, fatten it, and use it as a sacrifice and a feast during the period of Tabaski. What many people started to do during the drought was to deliberately take sheep into their households, fatten them and then sell them. SODEVA has seen this, and is trying to capitalize on it. What they are doing is to help the farmers build sheds for their animals. They plan to provide the farmers with nutrients which would enable them to fatten their animals more rapidly than it takes naturally. By so doing they hope to encourage farmers to move into a kind of mixed-farming, where the production of relatively fat animals would be part of their ordinary economic activities.

Theresa is also looking at the problems of cultivating gardens in Wadis. People have been willing to cultivate gardens in river or ancient river basins, but the technology is not very good and the fear is that there is not enough water, or fossil water for the government to invest in creating extensive irrigation systems. Nevertheless, people are interested in farming

in these areas and the question then is to ascertain what can be done since people are interested in extending their agricultural operations.

With respect to Theresa Ware's area, then, she has two types of populations: one organized by the Mourides and the government; and the other unorganized. She has unwittingly moved into an area in which she has a control population. The problem for her is to try to discover what kind of changes are taking place in both groups. We will see then what happens: whether technical innovations are more common in areas where there are no government or parastatal organizations present, or whether in areas where the cultivators and pastoralists are relatively free to experiment on their own.

Ambassador Aggrey was kind enough to attend a briefing session which we gave to USAID, and he asked a number of pertinent questions about the findings of both Alfred and Theresa. The people in AID did suggest that these presentations were some of the best they had heard in a long time from the many persons who had been going through Senegal presenting one report after another.

My charge to the two field workers is that they should continue to meet quarterly with the people of AID to report interesting aspects of their work, and answer questions. Apropos of this, both Theresa and Alfred have been talking to various researchers and consultants passing

through Senegal on AID-financed projects. I have counseled them to give these persons as much help as possible, but also to record the nature of their visits and try to record the kind of information provided them. The idea here is to demonstrate both to us and to the Scholars' Council that even while still in the field, they are providing a very valuable service to their counterparts. Hopefully, they will also provide valuable services to Senegalese who may stop in from time to time to talk to them.

When Ms. Brewton arrived, we were able to resolve a number of tricky administrative problems. The field workers, while fairly satisfied with their general salaries, feel that more funds should be placed at their disposal for such things as postage, gifts and so forth. They hope that the project will be continued and that their incomes might increase.

IVORY COAST

Our brief visit to the Ivory Coast was designed to meet Mr. Sutter and to determine whether he had the qualifications to work in Niger. He appeared quite bright, his French is excellent, and he is anxious to go to Niger. We decided to wait until the end of the summer and our visit to Niamey before engaging him. I saw Ambassador Smith who is on his way out of the

Foreign Service .

UPPER VOLTA

We were met at the Oagadougou airport by Mr. Atwell, representing USAID, and by Grace Hemmings. Grace has already been in the field and is working in the Bogande of the Eastern ORD, (Office of Regional Development). The population she is working with includes primarily Gourmantche speaking cultivators and some pastoral Fulani. I had the opportunity to talk to Mr. Marcel Poussi, the Director of the Centre Voltaique de Recherche Scientifique, who has agreed to direct Grace Hemmings' work. The problem here, as in Senegal, is that M. Poussi has not been able as yet to put a counterpart at Grace's disposal. The person he has in mind is still being trained in Paris and should return to Upper Volta at the end of the summer. Meanwhile, he has instructed Grace to go to Bogande, establish relations with the local population, and set the baseline for future work. Grace is spending a great deal of time getting herself organized so she does not have very much to report. She has also been trying to get a vechicle without duties and I was able to speak to the people at Customs and with the Minister of National Education about it. Hopefully, this problem will shortly be resolved.

Grace reported that many migrants are moving into

the area as a result of drought. Thus migration is one of the developments in this area. She has also made contact with the Fulani population and hopefully out of this contact will come some very interesting data.

As in Senegal, I took Grace Hemmings to meet with Mr. Atwell and she reported on what she had experienced. He was quite supportive and liked what he had heard. Hopefully, Grace, like the two other field workers in Senegal, would make quarterly reports in person to the AID people so that they would know almost immediately what changes are occuring, and how best to aid the population involved in this socioeconomic and cultural transition.

Mr. Poussi has agreed to the terms of the contract, and I spoke to the Minister and got his concurrence. I visited the President and the Foreign Minister, and appraised them of the nature of the project. Hopefully Grace will have little difficulty getting under way.

NIGER

Due to the late arrival of our telegram, no one was at the airport to meet us. However, the ambassador came to our hotel later on, and said that Mrs. Sally Sharp who had been delegated to meet us, was arriving the following day from Togo. I indicated that it was our fault for not having wired ahead so as to inform him about our change

in plans. The ambassador had been quite helpful, making arrangements with the Nigerian officials on our behalf, and instructing his people to help us. I called up Mr. Dioulde Laya of the Nigerien Center for Researches in the Human and Social Sciences and made an appointment to see him. He was well briefed about our project and only needed official permission in order to place someone at our disposal. With his help I wrote a letter to the Minister of National Education, and the next morning I took him a draft so that he could see it before its final submission. He approved the draft, seemed pleased with its general content, and also appeared satisfied with the qualifications of Mr. Sutter, a young man from Cornell we would like to send to Niger. Thus, judging from the reception we received from the Nigeriens, it looks as though the project should get under way without too many problems.

I had a long talk with Mrs. Sharp and with the other AID officials in Niger. They are concerned about the growing number of foreign researchers who are coming into Niger. They also believe that the Nigerians are beginning to resent the presence of so many expatriates given the general inability of Nigerian scholars to get money for fieldwork desired by the Nigeriens themselves. The ambassador was therefore quite pleased that the Sahel project is designed to include Nigerien scholars in col-

lecting and aggregating the data and finally diffusing the information. Thus, the situation looks hopeful. The only thing left now is for us to receive a letter from the Nigeriens authorizing Mr. Sutter to do the field work. It appears as though Mr. Laya will use Mr. Michel Keita as his counterpart. We shall have to wait and see.

The ambassador had a luncheon in my honor and invited a number of Nigeriens, including Mr. Boubacar Ba, the Rector of the University. We had a very interesting conversation and Mr. Boubacar Ba expressed an interest in establishing working relations with the Scholars' Council and in getting a linguist to work at his university. I recommended Dr. Mary White, a linguist from SUNY Buffalo, who is working in Niamey as a secretary for the Esso consortium. Hopefully, Mary will see the rector and with luck might get the job.

I also met in Niamey Mr. Ibrahim Konate who is the permanent secretary of CILSS. I shared with him some of my concerns about his organization and he spoke to the Minister of Plan who had me to dinner. The minister was adamant about people respecting the autonomy of CILSS. I shared with him my concern that there may have been a lack of understanding between CILSS and Le Club des Amis du Sahel which has recently been organized. The minister plans to be in the U.S. in September and hopefully should

have the opportunity to resolve any outstanding issues. I also informed the minister that I was planning to send one of my students, Dr. Pearl Robinson, to conduct a study of CILSS. He promised to give her his full cooperation.

In summary then, this trip to the Sahel was a successful one, and it enabled both Blaun and me to resolve many of the administrative and theoretical problems facing our researchers. We were able to gain the approbation of USAID, and hopefully the several ambassadors will report back to Washington about the performance of our researchers. My hope is that everything will now get under way and that by the end of this year we might be able to have a mini-conference, bringing together not only the American researchers but their African counterparts, and the African directors.

APPENDIX E

FIFTH INTERIM REPORT

NEW ADAPTIVE SOCIAL MECHANISMS

GRANT NO. AID/afr - 1162

Dr. Elliott P. Skinner
Principal Investigator

INTRODUCTION

The American researchers for Upper Volta (Hemmings) and Niger (Sutter), are settled into their research countries and preliminary reports indicate that they have begun exploratory tasks related to actual site location, preliminary data collection, and field observations.

Grace Hemmings arrived in the field almost one year before John Sutter, and thus has moved beyond the stage of exploratory tasks related to actual site location. She has decided to work among the Kouri Fulani herders and Gourmantche small farmers who reside in the canto of Piela. The reasons for this are: 1) the requirements of working among farming, herding and migratory populations was met; and equally important, 2) because of the willingness of these populations to cooperate with the research objectives. That portion of Ms. Hemmings' field report which provides a descriptive analysis of the village of Kouri, as well as the three other villages she visited, is included herewithin.

-- Section I --

I. VILLAGE OF KOURI

A. Description of Village -- This village is in fact two villages. For purposes of brevity they will be discussed as one. Kouri is comprised of two sectors; a Fulani and a Gourmantche sector. The Fulani are pastoral and the Gourmantche are peasant farmers. The Gourmantche village is comprised of 56 compounds. Each compound is comprised of a varying number of households. The only source of water during most of the year is a well. There is also a barrage (dam-like construction). The barrage, however, is dependent on the rainy season and may dry up during the drier months of the year.

B. History of the Drought -- The elders of the village felt that the drought began in 1964. The rains began as expected, but ended quickly and suddenly. 1974-75 was considered the worst year. Fifty percent of the crops were lost. The largest losses were reported in millet, the staple crop.

C. Migration -- In the last five years only ten young men have left the village. Their departure was not directly related to the drought. However, within the last three years, about sixty people have taken up residence in the village as a result of the drought.

D. Modification of Farming Methods -- The chief reported that farmers would be planting earlier this year than usual. This means that planting will commence around the twentieth of May or right after the second rainfall. The Fulani chief of Kouri informed me that 1973-74 was the worst year of the drought. The greatest losses occurred in the large livestock. Small animals did not suffer as much.

The Fulani sector of the village has no well. Securing water is an arduous task at all times of the year. During the rainy season, they avail themselves of water found in the seasonal ponds known as marigots. The ponds are usually infested. Water transmitted fevers and parasites are not uncommon in this village during the rainy season. Barrages serve as watering sites for the animals and are a great boon to the herdsmen during the rainy season.

E. Migration -- The chief reported large numbers of people entering and leaving the village as a result of the drought. He claimed that migrants came from Boulsa (south), Djibo and Dori (north). Some brought only their families. The total number of permanent immigrants was roughly thirty percent of the current village population.

F. Modification of Cattle Raising and Farming Methods --Among the Fulani the older people cultivate during the rainy season while the young take the cattle to the bush for grazing and watering. The young set up camp in the bush and remain there for the entire rainy season. The chief reported no differences in their methods of farming and animal husbandry.

II. VILLAGE OF DABESMA

A. History of the Drought -- The chief of the village of Dabesma has just died. I spoke to the village elders through their spokesman. The villagers began to feel the effect of the drought in 1967. They have felt the effects of the drought as recently as 1975-76. Although there was much rain last year, it was badly distributed. Just as the millet was about to ripen, the rain stopped. The villagers lost about thirty percent of their crops. Not only did their crops fail, but their fruit trees did not produce. Many were forced to sell their livestock in order to buy millet.

B. Migration -- Several families left the village to go further south. (Precise numbers were not available). In the last five years, roughly ten percent of the population has left for the Ivory Coast. Fulani from Dori have been transient

residents in the village during the height of the drought.

C. Description of the Population -- All the villagers are peasant farmers. Some raise large livestock in small quantities. Most raise goats and sheep as well.

D. Modification of Farming Methods -- In the last five years, they have started planting in May. Prior to this time, they waited until early June to plant. This method also has its advantages. If it does not rain, in a fortnight after planting, most of the seed is spoiled and the farmer is obliged to plant again.

III. VILLAGE OF KONGAYE

A. History of the Drought -- Last year was the worst year. Rains were badly distributed. The peasants were obliged to change fields and were sometimes forced to cultivate in other villages.

B. Modification of Farming Methods -- Planting as early as possible, i.e., late May. Last year, early planting had disastrous results as the rain did not arrive on schedule and they lost more than a third of their crops. As with the other villages, they were forced to sell livestock in order to buy grain. They also lost heavily in garden products,

such as corn, gumbo, tomatoes, peppers. Peanuts, an important cash crop, also fared badly.

C. Migration -- The chief reported a high number of people leaving for the Ivory Coast. More than 30 young men left in the last four years. None have returned.

IV. CONCLUDING COMMENTS

Of the four villages visited, I chose to work in Kouri Fulani and Gourmantche for the following reasons:

A. mixed population of peasant farmers and pastoralists;

B. comparatively sizeable number of immigrants to the village; and

C. willingness of the population to cooperate in the investigation.

I have already started inquiries in the form of household visits. In each visit, I try to document the size of the households within each compound, the number of fields cultivated by each, expected yield, types of crops cultivated, history of farming methods, etc. The farmers expect to start preparing the earth in a week.

-- Section II --

John Sutter's First Preliminary Report from Niger was a summary of his field activities dealing specifically with selecting his research site. Five sites were visited by Sutter, who was accompanied by the Nigerian counterpart, Issaka Duulaye. The methodological approach at this stage of his research was the same as that followed by the two research teams in Senegal and the one in Upper Volta. It basically consisted of meetings and discussions with national, regional and local authorities to apprise them of the project and seek their advice on how best to proceed. The Tanout region was selected because it has met the research criteria concerning drought affected populations and in addition, has a refugee camp which was not a drought phenomenon in Senegal and Upper Volta.

I. Within the study undertaken by the African American Scholars Council, on three population groups of the Sahel, we have conducted a preliminary tour in the districts of Tahoua and Zinder in order to choose a final study zone.

A. The agenda was as follows:

1. January 24-24: Kenni
2. January 25-27: Tahoua
3. January 28: Keita and Bouza
4. January 29: Madaoua

5. January 31- February 1: Tanout

B. To elect that zone, we have taken into account the following criteria, in addition to the terms of reference:

1. the presence in the zone of three population groups which interest us (population of the refugee camps, farmers, stockbreeders, farming the traditional pastures);

2. the geographical location (a region which has been affected by the drought);

3. the fact that few studies have been conducted in that region;

4. a rather high population density; and

5. the presence in the district of a development project. (so, the information and the general data obtained from our studies could be used as input in these programs).

II. The Method consisted of meeting with the administrative prefectorial and sub-prefectorial authorities and the staff on the field in order to describe to them the objectives of the study and the terms of reference. Then, we discussed with them the possible basis for the studies and we examined together, the region's suitability for the nature of research planned.

A. In Kenni, there is already a certain number of hydro-agricultural installations (Kawara, Moulela, Guidan Idor) and another important one has just been started.

B. In Tahoua, the concern is mostly oriented toward the stockbreeders populations and at the present time, many socio-economic studies are being undertaken (Tahou, Kao, Tchin and Tabaraden).

C. The Keita district has also hydro-agricultural installations within the large perimeter of Ibehamane.

D. In Bouza, after having discussed with the staff and the administrative authorities, it became clear that none of the villages could correspond to the terms of reference of the studies, with the exception of the village of Dikitan. However, if Dikitan and its surroundings were considered for study, it would be necessary to include the district of Dakoro, where numerous studies have already been conducted and others are under way.

E. In Madou, a region could have been found which fits the terms of reference, but there are no refugee camps. No specific development project has been designed for the district.

F. The region which best corresponds to the

criteria that we had to establish is that of Tanout.

III. In Tanout, besides the similarities with Madoua, there is a refugee camp where the first inhabitants have been living since 1973. The three population groups in which we are interested are assembled in that zone.

A. Tanout is located right in the Sahel, to the north of the culture regions (isohyete 300mm). It is a district of 34,000 square kilometers bordering the districts of Dakoro and Agadez; it has been very much affected by the drought. No specific development project has been undertaken in the district (Tanout is not covered by the 3M project for the department of Zinder). It should be noticed that a study covering the whole department of Zinder has just been put into effect by a team of researchers from the University of Arizona. The district is also included in the project "range management" of the USAID. We hope that the results of our study can complete the study made by the University of Arizona and be used for the implementation of the USAID project.

B. The district has 135,000 inhabitants comprising 100,000 sedentary farmers and 35,000 nomadic stock-breeders. There are four townships:

1. Tanout, comprising 156 villages
2. Gangara, comprising 110 villages
3. Tarka, comprising 90 villages
4. Olelewa, comprising 76 villages

-- 432 villages in all. The nomads are divided as follows: 1 Peul population of 96 tribes and 1 Touareg population of 56 tribes.

C. Livestock, which becomes an important economic issue during the drought are concentrated in the north. The herders transhume to the south during the dry season and go back to the north during the rainy season.

D. During the drought, the pasture problem had become critical. The stockbreeders migrate to the north, but increasing numbers are going to the south and the west, where water and pasture can still be found. Because of the drought, another migration pattern takes some stockbreeders up to Nigeria and Cameroon.

E. Regarding agriculture, the cultivation of fertile lands has been brought to a maximum particularly since the arrival of the refugees. It is getting more and more difficult to find new arable lands and the trend is toward extensive agriculture. The problem of the exhaustion of the

soil becomes even more apparent. Income farming (peanuts) and food farming are competing and the fallow period is reduced; more and more, "marginal" lands are put to farming (movement of cultivated lands toward the north where the risks created by the climatic variations are the greatest).

IV. CONVERSATION WITH THE KARA-KARA REFUGEES' CAMP

According to the last official survey conducted by the sub-prefecture (end of 1976), there are 118 heads of families. But meanwhile, arrivals and departures have taken place. Following our conversation with the interested parties, we have established that the camp contains:

-- 37 adult Touareg-Bouzou, who came from Agades;
-- 93 adult Touareg-Bouzou, who came from the district of Tanout;
-- 110 Beri-Beri, who came from the district of Tanout;
-- 10 Haoussa, who came from the district of Tanout.

(These data are of course preliminary and represent an approximation).

The nationals of Agadez have been the first to live there since 1973; they are all stockbreeders. The most recent

arrivals are the Beri-Beri of Tanout, who came only 6 months ago (last rainy season). They are farmers from villages located within a radius of 200km around Tanout. Other rural emigrants have established settlement because of the drought, in Tanout.

V. SOME TENDENCIES AND ADAPTIVE MECHANISMS

A. The families are broken up because of migration of variable length, particularly in the Touareg-Bouzou, who came from the Agadez region; one part of their family stays in the native region, while another settles in the Kara-Kara camp and other members go as far as Nigeria. The migration primarily affects the women among the essentially Touareg stockbreeders, as well as the Beri-Beri, who are specifically farmers.

B. The stockbreeders living in Kara-Kara devote themselves to farming in the same manner as some Peuls of the region do, by clearing the so far unoccupied lands around Tanout. Besides the farming of their own fields, they take on work as agricultural unskilled laborers in fields of the peasants at the cost of 200/F a day. They also perform other less important domestic work in the town of Tanout. The Beri-Beri take part

in the field crop of the sedentary farmers. They receive one bundle out of every ten harvested as compensation. Contrary to the Touareg's women, their wives perform domestic tasks in Tanout (crushing of millet). The men sell firewood and work as unskilled laborers in town (construction work).

D. Most of the inhabitants of the camp think they will never return home as long as their economic situation does not normalize. The Touareg-Bouzou of Agadez never will, until their herd is reconstituted. Some have even decided (resigned?) to say forever (the Bouzou of the Tanout district). The Beri-Beri hope to return to their villages only to cultivate their land while conserving the new cleared fields at Tanout.

D. The stockbreeders try to reconstitute their livestock (through buying particularly small cattle), but the process is slow because of the frequent interruptions. Forced to live on a day-by-day basis indeed, they almost immediately resell the animals in order to obtain money to feed their family. For that reconstitution to take place, at least three good successive crops are necessary. (There is a reconstitution project of the livestock under way

in the district, but it seems that it does not cover the refugees of the camp.)

E. At the level of agriculture, a regression has been noted in the rent culture in favor of food farming, since the drought.

VI. ORGANIZATION OF RESEARCH

The American researcher will settle in Tanout as soon as the documentation and review work regarding the orientation of the research are completed (around March 1, 1977). The Nigerian counterpart will maintain permanent contact with him and will join him in the field ten days per month or 1 month out of three. The work in the field will include a certain number of research questionnaires (individual and collective). The questionnaires prepared will aim at underlining in the nomads, as well as the sedentary farmers, the changes taken place in the economy and the society that have come to surface during the drought:

A. at the level of the family structures and the social relations within the same group, as well as within different groups (for example, the relations between the sedentary farmers and the stockbreeders);

B. at the level of migration (transhumance and migration toward the towns and the coastal regions; and

C. at the level of the economic activities (choice of cultivation), the work organization (agricultural wages, changes in the traditional trades and mutual help farms) and the soil care (land system, pressure on the cultivated land and shift of the cultures toward the north).

Finally, the study could focus on the socio-economic mechanisms which allow the agrarian societies to grapple successfully with the natural disasters, particularly by looking into the reason which enable some populations to regain the standard of living they had before the drought better than others. We think that a good knowledge of these mechanisms would be useful for any development program designed for these populations, who must face the climatic hazards of their environment.

-- Section III --

SUMMARY

The findings of both Hemmings and Sutter suggest comparative analysis based on the following similarities:

(a) lack of adequate water resources among farmers and herders;

(b) increased farming activities by traditional herdsmen;

(c) increased permanent migration of herders in search of grazing land and water; and

(d) seasonal migration by herders into agricultural zones as farm laborers.

So far, the most significant finding in the four research sites points to an evolution in production behavior; and thus in the production systems of herders in the Sahel. Their ideology remains that of the herder, whose ethnicity has in the past been inextricably interwoven with his occupation as a livestock breeder. Yet, herders are increasingly engaging in various activities within an institutional agricultural system (both cash crop and staple food production) in and outside of their countries. For example, resorting to alternatives such as cash crop farming themselves and hiring themselves out as farm laborers. These activities are most often viewed as a temporary hedge against further loss of animals through selling from drought diminished herds or, as necessary, sedentarization due to total loss of herd.

APPENDIX F

SIXTH INTERIM REPORT

NEW ADAPTIVE SOCIAL MECHANISMS

GRANT NO. AID/afr - 1162

Dr. Elliott P. Skinner
Principal Investigator

INTRODUCTION

The field reports from Upper Volta and Niger are providing the kind of data needed for comparative analysis with those of Senegal. Information on what farmers and herders are doing - how they are organized for production activities and the exact nature of the production systems - is increasingly substantive. The primary features of the agricultural systems are identified with detailed specifics on the labor division and the agricultural task-oriented calendar.

-- Section I --

I. Grace Hemmings has presented a close examination of farming activities in the Kouri Gourmantche site, by providing a list of agricultural tasks performed between late April and late November. As she points out in her report, the following issues are also highlighted:

(A) a list of all products cultivated and their use - category, i.e.; cash crop, staple food crop, base product in manufacturing

(B) an inventory of newly introduced crops to Kouri and surrounding villages

(C) an inventory of crops planted in 1976 that were not planted in 1975

(D) percentages of households engaged to each crop cultivated

(E) yield estimates for each crop harvested

(F) percentages of cash crops sold and the price received for each cash crop

(G) effect of varying rainfall patterns on yields as well as on harvesting procedure

(H) breakdown of agricultural activities according to sex

(I) description of the system of measurement

(J) discussion of the population

It is crucial that this type of information be documented for Sudano Sahelian populations, because of its relevance to project design and implementation. The importance of local production behavior and knowledge of local economic systems must be understood, since development projects stand a better chance of succeeding if they are based on the reality of local social and economic structures. Ms. Hemmings field data presented here is hopefully a contribution to that endeavor.

II. AGRICULTURAL CALENDAR

A. Late April (Preparation of Fields). In many cases preparation consists of cutting down trees and shrubs. After the fields are cleared, the remaining

stalks and stems are burned. At this time new fields are cleared with the help of work groups organized by the proprietors. (Work groups may include relatives and friends from various villages.)

B. Early May-Beginning of June (Soil Preparation). The first rains occurred around the middle of May this year. Cultivation starts officially after the second or third rains, i.e., within a week to ten days of the first rains. After the third rain the soil is soft enough for tilling. Only a small percentage of farmers started planting as early as May, most planted from June to July.

C. June (Sowing). Early morning and late evenings are devoted to work in individual fields. Most of the day's work is done in the family field. The fields require constant surveillance at this time in order to protect the newly planted seeds from being eaten by birds. Permanent residence is established in the fields at this time. Those residing in the fields during the agricultural cycle usually live more than a mile away from their work sites.

D. July (Weeding and Hoeing). Most of the agricultural activity is centered around the care of new plants at this time. Constant weeding and

hoeing are necessary. A small percentage of farmers had just begun sowing in July. The lateness was due to illness, death or other disruptions in the family. There was also a small percentage of farmers who had sown for the third time. Their first and second sowings had failed to produce seedlings.

E. August. Weeding and hoeing continues although activity is not as intense as in the previous months. More time is devoted to individual fields.

F. September. Corn is harvested towards the middle to the end of September. The corn crop breaks the period of famine characteristic of the planting season. Small portions of the millet crop begin to ripen. Weeding is continued in the other fields.

G. October. The beginning of the peanut harvest. The last of the corn is harvested and stored. Other products have begun to be harvested at this time. Rites for harvesting the first grains of millet have already been celebrated. Work groups are formed in order to harvest peanuts. Part of the tobacco, rice, and cotton crops have already been harvested. Production of secco (large straw mats used in the construction of compound walls as roofs for houses) is at its height. Much of it is used as an additional

source of revenue. The villagers sell it to members of the surrounding villages. Market activity is more lively than usual, as less time is spent in the fields and there is a greater variety of products on the market.

The planting schedule which follows is largely dependent on the amount or quantity of each group required for consumption. Thus, sorghum and millet are planted early as they are usually the largest fields.

Planting and Harvesting Schedule

	Planting	Harvesting
Sorghum	June-July	Nov.-Dec.
Millet	June-July	Nov.-Dec.
Peanuts	July	Oct. (Short Cycle) Nov.-Dec. (Domestic Peanuts)
Corn	July	Sept.-Oct.
Rice	July	Oct.-Nov.-Dec.
Cotton	July	Nov.
Beans	June	Oct.
Pois de Terre	July	Nov.
Sesame	June	Oct.-Nov.
Gumbo	July	Sept.
Tobacco	Sept. (Late)	Oct.-Nov.-Dec.

III. INVENTORY OF AGRICULTURAL PRODUCTS

A. Main food crops in order of importance: petit mil, sorghum, corn pois de terre, gumbo, (last two are garden products), and rice. --Main cash crops in order of importance: peanuts, sesame.

B. Crops used in the manufacture of products: cotton--used for making thread and weaving; liane--fibrous plant employed in making ropes; indigo--extensively used for dyeing village woven cloth; tobacco--processed and sold within the village.

Other crops: sugar cane, yams.

1. Number of households growing crops that they did not grow the year before. (None of these crops are new to the village.)

7	%	of compounds	cultivated	beans
10.2	%	"	"	cotton
5	%	"	"	tobacco
3.5	%	"	"	sesame
3.5	%	"	"	millet
5	%	"	"	pois de terre
5	%	"	"	sorghum

2. Crops new to the village or surrounding areas: soybeans, new varieties of corn and a new short cycle sesame have been introduced to the neighboring village of Piela. None of the farmers in Kouri have grown them as yet.

Percentages of Households Growing Each Crop

100	%	of all households grew	sorghum, millet or both
98	%	"	peanuts

95	% of all households grew	corn
37	% "	tobacco
65	% "	pois de terre
75	% "	sesame
80	% "	beans
56.8	% "	cotton
14	% "	rice
63	% "	gumbo
2	% "	yams

IV. DISCUSSION OF SYSTEM OF MEASUREMENTS USED IN THE VILLAGE

Units of measure given are the following: tasse, calebasse, tin, pannier. Accurate conversion tables are not available as yet. Within the system of measurement, peanuts in shell are measured as follows:

1 pannier equals 4 tins unshelled peanuts

1 " " 2 "

A. Estimate of Quantities of Each Crop Harvested by Entire Village

Last Year

Sorghum	130.5	granaries
Petit Mil	144	granaries
Cotton	111	panniers
Peanuts	1,413	tins
Sesame	319	tins

Beans.....	227	panniers +58.5 tins
Corn.....	524	packets (120 ears of corn each) plus 1 large granary and 2 small ones

B. Estimate of Quantities of Each Crop Sold

More than 90% of the peanut and sesame crops were sold last year. Prices for peanuts and sesame fluctuate according to the season and according to the company buying them. In November peanuts are usually sold at 350 CFA per tin. In December and January they are usually sold at 500 CFA per tin.

In November, sesame sells for 400 CFA per tin. In December its price is usually lower than those of private companies.

Very small quantities of sorghum and millet are sold. They are usually sold within the village. The ORD sometimes encourages the villagers to sell them their surplus of millet. This is stored in special granaries, thereby creating a reserve of grain. Other villagers sell their grains to private merchants who transport it to markets in urban areas.

Beans are usually sold within the village and in the local markets. Corn is not usually sold.

C. Effect of Repartition of Rain on Yield of Crops as Well as on Harvesting Procedures

There was more rainfall than expected this season. Piela, the neighboring village, registered 1,100mm (44 inches) of rain. This is more than 400mm (16 inches) over the average. Despite the abundance of rain, crops suffered as a result of poor distribution. There was a short drought at the end of July and the beginning of August which all but destroyed the corn crop. More than 32 of 58 compounds reported less than half the yield of the year before and many reported less than half the yield of the year before. Many reported total failure and all compounds reported a loss of some kind.

Following the short drought, there was an over-abundance of rain which destroyed much of the bean crop and weakened the millet crop considerably.

Rain continued into late October, as a result the sorghum crop was flattened by high winds and much of it started to germinate while on the ground. Losses have not been estimated as yet.

Individual fields of peanuts were harvested relatively early in October and November, since farmers were afraid that as a result of the over-abundance of rain, the plants would regerminate.

Harvesting of sorghum and millet crops was delayed as a result of the humidity. Those who planted early found that it was useless to harvest the ripened millet. There was too much humidity to allow the millet to dry before storing it. Much of the millet began to germinate as aforementioned.

D. Percentages of Men and Women Working in Fields

361 out of approximately 600 villagers work in the fields, 180 men and 181 women. Approximately 67% of all men and 69% of all women work in the fields.

V. AGRICULTURAL ACTIVITY ACCORDING TO SEX OF PARTICIPANTS

Peanuts are grown primarily by women but are growing in popularity with men. Of 213 peanut fields, 171 are grown by women.

Sesame is sown in collective millet and sorghum fields but falls under the jurisdiction of men. Cotton, tobacco, maize are also under the jurisdiction of the male population. Women are the only producers of gumbo and pois de terre.

Although each product comes under the jurisdiction of one sex, it is not uncommon to see members of both sexes working in each field. Men will sometimes help their wives in their peanut fields because in many cases, taxes for the entire family are paid from the money

earned when they are sold.

-- Section II --

John Sutter's field activities to date have resulted in some preliminary identification of adaptive strategies in operation during the drought. The data is the result of a questionnaire administered in four villages in the Zinder Department in May and early June 1977. Sutter's feeling was that these particular strategies in operation during the drought could have been the result of forced change to a highly stressful situation in contrast to planned or "deliberate" change. That portion of his field report which documents his findings concerning adaptive strategies utilized by farmers and herders is presented below:

I. AGRICULTURAL ADAPTATIONS

A. The large majority of farmers reported a reduction in hectarage cultivated as compared with the pre-drought situation;

B. There seems to have been a number of changes in crop mixtures, the area planted in cowpeas and sorghum has gradually increased, as well as the area planted in manioc (although still quite small). There is substantial department wide evidence that during the drought, and particularly since the

drought, farmers have put much more emphasis on food crops, to the detriment of the area's cash crop which is primarily peanuts. According to the annual reports of the Service d' Agriculture, peanut production in the Zinder Department in tons was the following:

1971	1972	1973	1974	1975	1976
111345	146971	31799	71425	15446	46400

C. Although the evidence on this question is far from complete, there seems to have been a decrease in the use of hired labor in the villages, due probably to the restricted cash resources of the would be employers; and

D. The quantity of seed used appears to have gone down, although farmers were obliged to seed more often than in normal years. Also, the source of seed shifted more toward the market, as many farmers, due to the extreme food scarcity, found it difficult to preserve sufficient seed.

"Innovations" in agriculture, particularly the types being promulgated by the government services and international agencies (plowed cultivation, use of fertilizer, increased seeding density, etc.), as a reaction to drought seem to be limited and localized.

It has been said that the last drought is different from previous droughts in that food was

available in all of the main markets for those who could afford to buy it. So, with the possible exception of a few rich villagers, farmers had to try all available means to get money. These means can be grouped under the following headings:

II. SECONDARY OCCUPATIONS

There appears to have been an intensification of the usual secondary occupations, or the adoption of a new occupation altogether; firewood collecting, mat-making, blacksmithing, livestock trading, manure-selling, and calebash carving were some of the occupations that were found to have been recently adopted.

III. MIGRATION

The existence of migration, accompanied by flows of wealth in the opposite direction, provided one of the strongest weapons against drought. Herders moved further south and stayed there longer, sedentary farmers found available employment opportunities in the south of the Zinder Department and in the city itself (construction, brick making, water-carrying, peanut-harvesting, etc.). Daily wages for the migrants averaged about 150-250 CFA/ day.

Migration was, as usual, selective, with males from 17 to 40 years old forming the vast majority. In

Gourbobo, the northernmost village, during the period of 1972 to 1975 there was at least one person in 22 compounds who migrated, out of a total of 68 compounds in the village. That figure is remarkable, for it means that in an area that received 147mm of rain in 1972 and 208mm in 1973, the vast majority of people found other means of coping with two successive miserable harvests. (The rainfall figures are from the cheflieu de l'arrondissement, Tanout. Gourbobo undoubtedly received even less.)

IV. SALE OF LAND

There appears to have been an increase in the outright sale of farmland, although its incidence is still rather low. However, the system of lending against money is spreading and taking the appearance of a sale, if not theoretically, at least practically. The process works as follows: some peasants, in order to get the cash they need, are forced into selling some of the millet they have saved for their yearly consumption. When the soudure comes (the tight, hungry season preceding the harvest), they have to sell their labor to buy food, instead of working full time on their fields, hence obtaining lower yields. At a given point in time, cash demands are such that the farmer borrows money from

someone who has got it and puts up his field as collateral; the lender can use the field until the money has been repaid. As often happens with debts, the peasant can not get the money to repay, and the field stays in the hands of the lender.

V. SALE OF LIVESTOCK

In the early stages of the drought, the sale of animals proved to be a very important strategy, and appears to have been widely used. One of the advantages of keeping a sedentary herd is that it is an insurance mechanism; an animal can be sold in times of shortage instead of selling millet. However, after the first crop failure, livestock fodder and feed of any kind became so scarce that farmers were forced to sell off their herds at extremely low market prices, or watch them die off. Sales of animals no longer yielded the owners any great amounts of money, to speak of. Overall losses of animals in the research villages appear to have been quite high.

VI. OTHER MISCELLANEOUS ADAPTATIONS

Communal solidarity or institutions of entr'aide (mutual self help)--to what extent did these institutions and other sharing mechanisms come into play during the drought? The one instance of entr'aide that we were able

to look into is the gaya. The gaya is a Hausa institution signifying collective farmwork performed for cash remuneration at lower than the prevailing wage rate. The size of the work party can vary considerably - the range we found was from 3 people to over 60 (a gaya called by the village chief in Falenko). The mean falls somewhere around 8-15 people. Formerly common, the gaya nowadays is becoming more scarce, increasingly being replaced by salaried labor.

In Gourbobo, we asked all household heads about the number and size of gayas they had organized since 1970. The results indicate that there were few gaya during the worst of the drought years ('72 and '73), with an increase in the 1974 agricultural season, which was a pretty good year. At this point, however, it would be premature to draw any conclusions on village entr'aide. The gaya may well be a very particular case - it is not that villagers were less cooperative during the worst years of the drought, it's just that the particular requirements of the gaya were not met (i.e., there must be an adequate amount of work in the fields to make calling a gaya worthwhile).

-- Section III --

The field reports of Theresa Ware from the Mouride farming zone in Senegal and the herding zone in Decvotte

have revealed that during the drought there was (1) a cutback in the amount of land under peanut cultivation due to a dwindling seed stock (seeds were eaten during periods of severe food shortage), (2) intensification of dry-season income generating activities, (3) seasonal village exodus or seasonal migration to towns for the duration of the dry season, in contrast to pre-drought weekly excursions into the nearest commercial center to make extra cash, (4) increased selling and pawning of farm tools for ready cash, and (5) increased loss of land due to inability to reclaim it after turning it over to a lender for cash. In Senegal this is referred to as "mettre engage". These were behavioral responses which parallel the findings of Sutter in Niger as he outlined them above.

While our information to date indicates that we are dealing with one culture area of Sudano-Sahelian farming and herding populations, the exact nature of specific environmental niches within the Sudano-Sahelian culture areas as documented in the field reports, is a way of providing information on rural populations of utility to external donors and African development planners.

light piece of machinery to extract the sand and dirt. They are then ready to be bagged and taken to the receiving station to be weighed and sold.

Each village has its own cooperative which came into existence with the nationalization of peanut production in 1961-62. It is through the cooperatives that seed, fertilizer, equipment and plans and programs are funneled. At the moment, none of the cooperatives are autonomous or independent in terms of production decisions. In 1966 the government created l'ONCAD--Office National de Cooperation de l'Assistance pour le Developpement: for the purpose of assisting the cooperatives in the commercialization of peanuts. It is l'ONCAD which sells the grain/seeds in May and buys the peanuts in November-December (actual cash is not given to the farmers at the time of the sale of peanuts. They are given rather a voucher or IOU specifying the weight in kilos and the amount this brings. These vouchers are presented in January. Also, peanuts cannot be sold before the opening date set by l'ONCAD and l'ONCAD has the first bid on the harvest. L'ONCAD has rural development counselors who maintain direct contact with the cooperatives, e.g., l'ONCAD representatives request meetings and/or conferences with villagers through their coop representatives for the purpose of disseminating information concerning new plans or programs and for receiving feedback from the farmers concerning existing programs, etc. There are varying individual and collective opinions about the efficacy of l'ONCAD. This may revolve around the tension engendered over the price received

each year for a kilo of peanuts, the price for which is determined before the crop is harvested, and is not determined by l'ONCAD. A second important government agency in the arrondissement is SODEVA--Societe de Developpement et de Vulgarisation Agricole--created in December 1968 to replace another rural development agency which had existed in the peanut basin since 1964. SODEVA at the present time exists only in the regions of peanut cultivation-- Diourbel, Thies and Sine Saloum. It has the responsibility of providing technical advice concerning the use of chemical fertilizers, the use of selected seeds, the care and use of agricultural equipment and machinery. The objective is to help farmers realize increased peanut and millet yields; the ultimate objective being to increase the national export capacity and to have more millet for consumption through farmer intensification programs. While SODEVA's relationship with the farmers seems to be less intensive (perhaps this is because the relationship is not based on the buying and selling of the harvest, but rather on technical assistance, which many farmers in the arrondissement consider to be "with no strings attached"), it does seem that SODEVA enjoys a type of popularity among the farmers. In a document entitled "U.S. Government Relief Programs in Senegal" which I received from an AID/Dakar official, Mr. Malcolm Versonin, July 1975, AID is coordinating a "farmer intensification program for improved production of millet, sorghum and peanuts" under the aegis of SODEVA. Both SODEVA and l'ONCAD

come under the Ministry of Rural Development which has several other development agencies under its direction.

In terms of project collaboration it seems that we should coordinate our inquiries with the ongoing work of SODEVA ,because of their objectives and the nature of their relationship with the farmers in the arrondissement; a determining factor in terms of the Senegalese counterpart is that one of their rural development counselors was the former private secretary to the late Khalife-General, Falilou Mbacke (the department is named after the great grandfather of the founder of the Mourides and the commune of Mbacke was created in 1772) who died in 1968. The counselor in question worked as the private secretary (his primary responsibilities were as a translator from Wolof to French) for Falilou Mbacke for eight years before he became a counselor for SODEVA which until 1968 was called SATEC. He thus has the trust and respect of every marabout, village chief, and notable in the arrondissement.

The Ministry of Rural Development is actively involved and committed to plans and programs for the amelioration of agricultural and pastoral problems in the Sudano-Sahelian zone of Senegal (see enclosed articles), so a collaborative effort under the aegis of SODEVA should provide us the excellent opportunity of contributing to their development plans and analyses.

As far as the agricultural population is concerned we

have found so far that (1) increasing acreage is being devoted to the cultivation of millet and various drought resistant types of manioc for indigenous consumption; (2) farmers are investing in increasing numbers in domestic animals such as goats and sheep to be sold commercially; (3) land set aside by the government "terre neuve" is being occupied by the more prosperous cultivators who have or can get initial capital to buy equipment to work the land--small farmers and poor farmers cannot take advantage of this; and (4) many Peul have become cultivators and some had high yield peanut crops--many agricultural extension workers say this is due to the fact that those who did not lose all their cattle during the drought had a natural source of fertilizer. The few we have talked to so far say that they plan to plow their money from the sale of peanuts back into the purchase of cattle. It remains to be seen what this may mean in terms of national development because they may represent a new productive force in peanut production, but I don't know how widespread this switch from pastoralism to agriculture is or what is the present impact of the change.

As far as the pastoral population is concerned the counselors at SODEVA-Mbacke have told me that the best time to do any meaningful work among them is during the rainy season when they return to their usual sites. From

November to May they are continuously on the move seeking food for their cattle, thus doing work among them is difficult during the dry season. In terms of the urban population,we plan to begin tracing them by requesting specific names from the village of origin. During the drought there was no uprooting of entire villages and neither were there refugee camps. The problem of movement out of the villages most affected by the drought has been, I think, both cushioned and difficult to pinpoint because of the extended family system. Generally, the people who left during the drought are in Diourbel and some are as far as the outlying poor communities just outside Dakar. At any rate there do seem to be in existence structures which were created as a response to a crisis situation persist to this day and could raise interesting questions in terms of development plans and programs.

APPENDIX II

My progress in pursuit of the Sahelian research project has been in terms of ingratiating myself in Senegalese institutional structures, broadening my acquaintance with the current literature on the sociological implications of the drought, undertaking interviews with various officials, scholars and other informants and investigating possible research sites.

The achievement of most critical importance to the success of the project has been the negotiations for integration in the structure of SAED (Societe pour l'Amenagement et l'Exploitation des Terrains du Delta du Fleuve Senegal), the Senegalese organization charged with promoting the agricultural development of the river valley. Dr. Skinner, well before my arrival in Senegal, had made contact with Papa Kane, the director of the Ecole Nationale d'Economie Appliquee. The ENEA is responsible for training Senegalese rural development professionals. Papa Kane put me in touch with Papa Cyr Diagne, the Secretary-General of SAED. Over a period of four months or so, interrupted by a bout with viral hepatitis and by Kane's and Diagne's travels, the three of us have worked out an arrangement whereby I will have access to SAED installations, equipment, documents and personnel. In Senegalese institutional terms I am doing research under the aegis of SAED.

Even more valuable than access to SAED facilities is the probability of finding a research counterpart through SAED. Papa Cyr Diagne and I have been discussing the feasibility of detaching a SAED staff member from his official duties to devote himself full-time to the research project. There are several problems to resolve before we can designate a counterpart. The advantage of working with a SAED counterpart would lie in his knowledge

of the terrain and the people in the area and in his being a direct conduit for our data to the Senegalese agency most interested. The disadvantage would lie in the tension that must inevitably exist between a politically and economically powerful institution and the people dependent on it for their welfare. Some of what I would gain by having a knowledgeable professional as my counterpart,I would lose by being too closely identified with an organization that has institutional interests that may conflict with those of the people among whom we will be pursuing our inquiry. I see no way at the present time to resolve this dilemma.

I have had the chance to read through a great deal of the current literature, almost all of it in French, much of it inaccessible outside Senegal. The literature argues that two phenomena, often taken for one, contributed to the tragedy of the last several years in the Sahel. These two phenomena were drought, a natural phenomenon, and famine, largely the result of human behavior. While the drought, in terms of meteorological statistics, seems to have been no more severe than droughts of the past, the famine seems to have been the worst in several generations at least. The culprit is government agricultural help.

Agricultural policy has been to develop cash crops as much as possible to integrate the local economy in

the world market system. In Senegal this has meant, more than anything else, encouraging the cultivation of peanuts. This puts the peasant farmer in a precarious position, however. For one thing he is gradually exhausting his land by constant production of only one crop. (The area around Louga, Senegal, the original center of peanut production, is experiencing steadily declining yields). For another thing, devoting so much of his resources to producing cash crops, he is hard put to produce subsistence crops in sufficient quantities to feed his family. He must depend on the world market system to provide sufficient revenue for his peanuts to enable him to gain access to sufficient food supplies to meet his needs. Apparently, during the drought, there was a significant shift from cash crop production to subsistence crop production.

One aspect of the growth of cash crop production has been the expansion of cultivated areas to the detriment of pasture lands for nomadic herds. The tensions between the nomads and the cultivators have been comparable to those between farmers and cattlemen on the late 19th century American range. As in the latter case, government policy has been to favor the more intensive use of land practised by the cultivators. The pastoral nomads, consequently, have had to change their former transhumance patterns and move toward the more marginal lands

to the north. But they have put themselves in a particularly precarious position for dry years. The nomads were hard hit during the drought, harder hit than the cultivators. During the severest stages of the drought there were reports of nomads shifting into cultivation. Likewise there were reports of nomads investing increasing efforts in grain cultivation while still delegating part of their families to care for the herds that remained. At the same time in a major departure from previous practice, nomads, on their own initiative, were increasingly pursuing access to the government system of education for their children as a way out of the present impasse for future generations. Finally, there seemed to be an increasing tendancy to commercialize cattle. In the first instance, nomads glutted the market trying to sell their emaciated cattle before they died leaving the nomads with nothing. But too many cattle were chasing too little grain. The value of cattle per head plummeted. Nevertheless, it seemed that many nomads had come to the conclusion that, to avoid the present situation in the future, money would be a more dependable store of value than cattle. Of course, it remains to be seen to what extent a conclusion reached in the aftermath of a crisis persists over a longer term.

In addition to reading I have had the opportunity to

present our research proposal to officials in relevant government agencies, to staff members in various research institutions in Dakar and to people pursuing the very subsistence activities in which we are interested. Several of these sources emphasize what one of them calls the "proletarianization" or rural labor since the drought. There is an increasing tendancy for the rural dwellers to leave their villages, at least temporarily, to hire out as farm labor for wages to any of the larger land-holders of the area. I visited such a farm about twenty kilometers north of St. Louis. The farm was "owned" (--in fact the government claims ownership of all rural land, a claim that can have important sociological consequences--) by a Senegalese staff member of a local cattle station. He had hired about a half a dozen men to work for him. They were, by appearance and dress, southern Mauretanians. They drew water from the two wells on the, perhaps, three or four acre plot and manually distributed it plant by plant. On the plot I saw tomatoes, young mango trees, hot pepper, cabbage, lettuce and carrots. To what extent this private installation is representative of current trends remains to be seen.

In addition there has been a willingness of increasing numbers of nomads to settle down especially when offered alternative pursuits such as offered by SAED.

SAED claims to have received a significant number of Peul families in its installations. All the families that settle in the SAED perimeter come voluntarily. These Peul families, along with the other families in the SAED perimeter, now cultivate rice and vegetables for sale in Senegalese urban markets. Nomads are hedging by going further and further into cultivation. At the same time, cultivators are hedging by keeping a few head of cattle. There seems to be a movement from both sides toward mixed farming. Cattle is increasingly commercialized in the process.

For the immediate future I must decide on sites at which to conduct research. We have proposed research in three communities: a community of sedentary cultivators, a community of pastoral nomads and a community of resettled migrants. For a long time the nomad and cultivator communities have had relations of inter-dependence. The pastoralists were the politically dominant caste in pre-colonial times. They bartered their surplus milk products for grain. They grazed their cattle on fallow land thereby helping to enrich the land for the next cultivation cycle with attendant cattle droppings. This symbiotic relationship was disrupted during the colonial era by an agricultural policy that pursued cultivators' interests to the detriment of herders'. I am looking for a site

encompassing a community of herders and a community of cultivators preserving as much as possible of the inter-dependence that I describe. Not only will I be able to see the changing patterns of behavior of the herders and the cultivators as separate communities in response to the drought but I will also get insight into the changing relations of the two communities. Various informants have given me suggestions for such a site. Rao, Mbane and Guede are most often mentioned.

I will probably choose a settlement within the SAED perimeter for the migrant-resettlement community. Many people who have come to settle within the SAED perimeter come from the drier areas south of the Senegal River but not too distant from it. They suffered from the drought both in their home villages and at their SAED plots. After several difficult years due to lack of water they have recently been suffering the depradations of a rat infestation. They, too, are beginning to hedge. They are spending part of their resources cultivating their SAED plots then "commuting" to their holdings in their home villages, usually not too distant, to put in a bit more time and resources. After an initial willingness to commit themselves to SAED several successive difficult years have discouraged settlers from making a complete break with home.

APPENDIX G

SEVENTH INTERIM REPORT

NEW ADAPTIVE SOCIAL MECHANISMS

GRANT NO. AID/afr - 1162

Dr. Elliott P. Skinner
Principal Investigator

INTRODUCTION

The following is a narrative overview of the Sahel project activities for this reporting period. The data presented is a collation of findings and observations submitted by the field reserchers, Grace Hemmings (Upper Volta), Theresa Ware and Abe Waldstein (Senegal). At this stage of the study and based on these observations, we'd like to submit a brief recommendation:

AID may be interested in examining the possiblity of supporting what is presented here, as a very modest activity which stresses employment related to increasing food production. The idea of a small poultry project would increase the income of the women, but more importantly would increase their purchasing power for food and other needed consumer items. Care must be taken that the project maintains a high degree of self-sustaining and self-replicating power, in order to have a spread effect that will guarantee its success.

In the continuing field reports from Upper Volta, Ms. Hemmings' data supports her original reservation that international donor intervention "was a greater vector of change than the actual drought itself." This observation was presented in the second interim report

to AID. Ms. Hemmings thus feels that adaptive responses on behavior to the drought have meant the operationalization of strategies which, "may mean restructuring of the whole society to fit a larger structure that may better insure against future ecological crisis." The reason this seems such a striking phenomenon in the Kouri Gourmantche research site, is because the area had remained isolated in terms of its integration into larger socio-economic structures. Ms. Hemmings' support for this finding was based on field observations for which she has identified what she refers to as "indices of isolation":

1) lack of consumption of manufactured goods
2) the relatively low level of literacy
3) paucity of government personnel
4) lack of year-round navigable roads
5) lack of hospitals and schools
6) the low level of in and out migration

It is pointed out in the field report that although the impact of international donor intervention in the area seemed to be positive at its commencement because it "expanded economic opportunities", further examination of initial impact in terms of economic

change "have shown that social relations among members of the village are gradually being altered and not totally to the benefit of the villagers."

This type of finding would have important significance to development intervenors, in terms of the relationship between compatibility of an intervention with the socio-cultural environment in which it is to be introduced. The crucial issue of self-replication and self-perpetuation of external drought intervention activities is addressed within this context. For example, it is pointed out that one of the ways in which local economy was stimulated was through the creation of jobs under drought related projects. Ms. Hemmings does not feel these jobs are ultimately self-perpetuating, since they are external interventions utilizing only some of the local resources base, namely laborers, for a specified period of time. She raises the question of "what will become of barrage builders, well diggers, and other labourers, once these projects are terminated?" It is this type of question which the development planner and intervenor must grapple with, in looking at the soundness of any new development activity in a socio-cultural system.

In the field report from the Mouride zone of Senegal Ms. Ware suggests, based on her findings, that "a rural development strategy or project within a strategy, whether it is initiated by the national government or by an international donor at the request of the national government, should concern itself first and foremost with harnessing its programs to those on-going activities of the small farmers and herders. The purpose would be to maximize an increase in small farmer's and herder's general welfare and productivity that can sustain and replicate itself through maximum utilization of local and indigenous materials, tools, and manpower, with minimum dependence on a network of external delivery services, materials, tools, and personnel. The small farmer and herder simply cannot participate in programs which require expensive inputs and elaborate delivery and administrative services". This point is illustrated in the example of a rural reform strategy in the early 1960s. According to the report from Ms. Ware, in 1964 the Senegalese government commissioned a French development assistance firm, SATEC (Societe d'Aide Technique et de Cooperation), which was funded by France and the EEC to implement the rural reform strategy with the

following modifications:

a) the primary objective was to achieve a twenty-five percent increase in peanut and millet yields over a three year period; and
b) the geographical scale of the project was quite extensive - it included a portion of the Diourbel region and one other region, a total of thirty-nine districts with a spread effect to approximately 165,000 farmers. SATEC had responsibility for coordinating the marketing and credit agencies, the peanut cooperatives, and the recruitment, training, and supervision of a team of rural extension workers. Government contact and feedback would be through this cadre of rural extension workers who would work and live in the villages. This cadre of workers would be supervised by a staff of young graduates (mostly French) of European agricultural schools. By mid-1965 rural development officials in Dakar were anxious to see the strategy in operation and requested that SATEC assume full responsibility for distribution through the credit program, of farm tools and light machinery - namely, seeders, hoes, carts, and fertilizer. Extension workers began compound-to-compound visits urging farmers to purchase these inputs on credit.

Ms. Ware pointed out that one of her informants who was president of the peanut cooperative in his village, summed up very succinctly the attitude of the small farmer to SATEC's development strategy when he stated the following:

> "We certainly wanted to improve our living conditions and I am not against development projects, but these projects always find us poor - too poor - to participate. I cannot buy fertilizer on credit and when the price of peanuts dropped I was not anxious to get involved in this new program (Interview-March 1976)."

In both the Upper Volta report and the Mouride Senegal report, the researchers drew attention to the need for self-sustaining and self-replicating economic activities based on their respective field observations. Paralleling Ms. Ware's statement on the need for minimum dependence on a network of external delivery services, materials, tools, and personnel, is Mr. Waldstein's field observation from the Kassak Senegal zone that "Peasants bridle at the possibility of becoming thoroughly dependent on SAED for their welfare." A portion of his analysis of that dependency is presented here:

The central government sets the price of the materiel and services the producer relies on to cultivate his plot. In this way the government prescribes the largest part of the cost of production. At the same time the government determines the price to be paid producers. But prices for materiel and services have been rising more rapidly than the price

paid for produce. Barring a rise in productivity per hectare, a rise granted, predicted with the conversion to tertiary works, the producer runs the danger of seeing his net earning gradually wither away.

The producers depend on SAED to evacuate, market and reimburse them for their produce. Before the opening of the cannery in Savoigne, Kassak tomato growers were responsible for trucking their produce to the urban areas to sell on the free market. They vastly prefer that system. SAED has appropriated that responsibility since 1972. Tomatoes are more perishable than rice, and frequently rot in their crates in the field awaiting SAED coordinated pickup. Ba (1976) recorded the most egregious of such cases in Gae during the 1975-76 season. Producer groups may take matters into their own hands and bribe truck drivers to evacuate their produce out of their scheduled sequence. There is no compensation to the peasant for losses that follow inopportune pickup.

Yet even if the produce is evacuated before it spoils, the producer may witness long delays in payment. The tomato cannery is notorious for its poor payment record. It took ten months to reimburse SAED for its tomato deliveries of the 1974-75 season

(Republic of Senegal, 1976). Sylla and Diop (1976) indict the Office National de Commercialisation Agricole et Development (ONCAD), the government produce marketing monopoly, through which SAED funnels its rice to market, for the same transgression. SAED, consequently, has trouble meeting its expenses every year. It must delay making payments to the peasants, who depend on them for their welfare, simply because the tomato cannery of ONCAD delays reimbursing it for the produce they absorb. Compounding the problem is the delay in central government reimbursement for peasant debts to SAED, cancelled during the most acute crises of the drought years (Republic of Senegal, 1976).

A further peasant dependency on SAED is for debt financing. Until 1969, the BNDS offered producers credit through SAED. However, the poor reimbursement record following the disastrous 1968-69 harvest led to a refusal of credit the following year. SAED has, since that time, extended the credit itself (Diagne, 1974). He who extends credit defines the credit-worthy. On that basis, SAED is able to sort the cooperative members it deems undesirable out from those it wants to retain cultivation rights in its

polders.

Finally, insuring proper use of the irrigation works as they become progressively more refined, requires a large staff of extension personnel trained to a fairly high standard of technical expertise. Maintaining a competent, well-trained staff of extension workers has proven a difficult enough task for SAED in the secondary works. Workers are often not at their job sites. They occasionally have violent conflicts with the peasants. The Fulbe of the Kassak Sud Peulh A.I.R. openly discussed manhandling one particular extension worker assigned to oversee their work. He did not show them the interpersonal respect to which they felt themselves entitled. He, as many like him, did not have the sensitivity to interpersonal dynamics that comprises one skill essential to adequate fulfillment of his role. Staffing and developing an extension program of the intensity necessary for competent use of the tertiary works, takes a far greater investment in money and personnel than for less intensive technologies of exploitation. More capital intensive investment programs will demand not only an expanded personnel roster, but training to a far more refined technical level than more labor intensive developments. The extension worker will be

called upon to oversee the operations of the somewhat delicate hydro-agricultural works, as well as supervise field operations in the high yield varieties which, however sensitive, must be cultivated to make the investment pay off.

SUMMARY - AID

Both Ware and Waldstein have pointed out the lack of accountability by the development agency in their respective research zones to the small farmer. These were independent observations since the two researchers were not working in tandem. A way should be devised to strengthen and streamline the delivery systems/services to the farmer and is flagged here as an issue which AID may wish to address, in terms of assessing existing channels through which projects can be implemented.

One of the issues to be addressed in the social soundness analysis is identification of who is affected by and who benefits from project implementation. The Hemmings' report discusses the differential social impact of drought intervention in the Kouri Gourmantche area, especially on women. She stated that "Newly established economic alternatives are more readily available to young men than to any other segment of the population.

This fosters inequality of access to wealth, thus fostering economic dependence of women on men. In addition, participation in new forms of economic activity fosters the breakdown of many positive social relations of production between members of the village community, consequently altering social relations between members of the society. The peasant has less access to communal labour, is not as free to participate in reciprocal relations of production and must therefore pay for services which he could once depend on friends and relatives to provide. At the same time that these protective institutions are being dissolved, new economic relations offer few protective structures to replace the old ones."

According to Hemmings, there are members of the village community who have been adversely affected by the changing economic dynamics in the area. She suggests, however, that "the negative aspects of these changes may be minimized if long range effects of development policy are carefully assessed."

It seems that a fairly long range view is being taken by SODEVA in the Mouride Senegal research area, vis-a-vis the more productive inclusion of women in phases of the national development strategy. In order not to snatch

the description of this finding out of its context, the full discussion of it from a systemic point of view is presented here:

This activity began during the drought when a number of farmers in the district started buying livestock and fattening them for resale. SODEVA encourages this activity and initiated the channeling of this activity towards a more development oriented end by incorporating it into the rural development strategy. Cattle fattening for profit was in innovation in the district, which was a diffusion from the Serer Sine Saloum region which spread to the district in 1969. By this time, Fulani herdsmen who transhumed in and through the district were desperately selling emaciated cattle, sheep, and goats. There were instances in which an emaciated bull sold for $30, a milk cow for $20, and a heifer for $10. Enterprising small farmers were buying these animals and fattening them up for sale at a profit to itinerant cattle buyers who, in turn were selling them to slaughter houses or small butcher shops. How did the government view this activity in terms of its own goals? SODEVA recognized in this innovation, the possibility for its inclusion in its draft oxen program which was part of the national development strategy. The national development bank was requested to underwrite

seed money for SODEVA's idea to incorporate this farmer-initiated innovation into the national strategy. Farmers recommended to SODEVA's regional office by rural extension workers, who were SODEVA's direct link to the farmer, were approached and asked if they would be interested in purchasing cattle with money from SODEVA and fattening these animals on food paid for by SODEVA. At the end of the three month fattening period, the farmer would sell the animal or animals to SODEVA at enough of a profit to repay the initial investment by SODEVA and clear a profit for himself. The economic situation for the farmer in the district had not improved, so, unfortunately for the draft oxen program of SODEVA, many small farmers would buy the cattle and resell them before they were fat enough to bring a profit and then use the money gained from the sale. This meant that SODEVA got no return on its seed money investment. Finally the national development bank ceased to underwrite the program and this innovation did not survive in that form.

In spite of the problems encountered by SODEVA in implementing its objectives of the national strategy, the strategy seems to represent an adaptive trend or innovation which small farmers have begun to shift towards as a hedge against hard times. The shift towards this particular

adaptative strategy seems likely to continue in the same direction as long as there is adequate variation in the environment and as long as rural attitudes toward drought perception remain constant and hydraulic resources remain underdeveloped. Any variation which represents an improvement on this strategy will have a selective advantage over the original. Only those variations which represent improvement along the line of an established trend are likely to survive (Alland 1970). Cattle fattening in the district which was an innovation initiated by small farmers themselves, was integrated into the national strategy as a variation which represented an improvement along the line of an established trend. But, was it really an improvement along the line of the established trend in trying to modernize the agricultural system? It seems not, because the small farmer initiated this strategy as a source of quick money and as a hedge against hard times as he perceived that drought could be a very long and/or recurring hazard to his primary production systems, as opposed to being initiated as part of a larger national long-range rural development strategy. The farmer could not wait two or three years to reap the benefits of the improvement of draft oxen over the horse and donkey as work animals in the fields. How, then,

could this innovation have been optimally incorporated into the national strategy? Possibly through the development of an animal husbandry program managed by women - a program consisting of sheep, goats, and/or poultry. While men have full responsibility for the care and feeding of cattle, women assume responsibility for sheep, goats, and poultry. The proper care and feeding of these animals would have an impact on an intensified crop production program, if for no other reason than the production of manure for the fields. The sale of eggs and even of chickens would bring quick money. In 1976-77, the approximate total of domestic animals in the village of Ngabou was sixty-five sheep, twenty-five goats, twenty cattle, twenty-two horses, nine donkeys, and eighty-five chickens. While this smallholding of domestic animals cannot begin to provide adequate manure for the hectares under cultivation, a consistent and diligent beginning could have some positive results in terms of attitudinal development concerning the use of manure. The problem of transport to the fields, could be resolved by marshalling a joint effort in the utilization of existing carts in the village. This should pose no problem, since many of the Ngabou farmers are already engaged in a mutual cooperative effort when they borrow, for example, a

neighbor's horse and will loan that neighbor their seeder. Some compounds that had only one or two sheep and goats before 1973, now have two or three and informed me that whenever possible, they intend to purchase more, because these animals can provide an amount of added financial security if the need for cash becomes an immediately pressing problem. The possibilities for poultry raising as a variation on the cattle fattening or "embouche bovine" activity, has a precedent in the village which increases its chances for success and ability to sustain and replicate itself without large external inputs.

Beginning in 1964, there was a poultry house in the village and approximately three hundred eggs were sold per year. During that period the chickens were fed millet, millet husks, and feed bought from a local merchant in Mbacke. This poultry house belonged to the women of the village and was initiated by the wife of Malaw Diouf who involved the other women in this enterprise. Each woman was asked to contribute 150 CFA francs for the maintenance of this activity. According to Malaw Diouf's wife, each woman who participated in this activity was proud of her contribution to a profitable undertaking. Each woman had the right to sell the eggs of chickens she contributed and to take some of the small chicks to her

compound to start her own poultry raising activity. The women took turns cleaning the poultry house every day and feeding and watering the chickens. Access to a market for the eggs and chickens was no problem since the village is only eight kilometers from Mbacke and is located on the main route which provided an additional clientele in the form of travelers. I was informed that one of the residents of the village who has moved to Dakar had one of the most thriving poultry houses in the village. Her chickens were fed feed which she bought in Mbacke and produced eggs every day. With her profits from the sale of eggs and chickens, she started to invest in sheep which she fattened for sale.

Unfortunately, the poultry activity stopped when the chickens began to die each year between December and January, from an illness which the villagers could not isolate. This diminished the poultry stock to the point of abandonment of the activity by the women. The wife of Malaw Diouf and several other women in the village informed me that the women would like to start this activity again, because they feel that it is important to have something to fall back on when the crops fail, but they are concerned about the illness which attacks the chickens in December. Alioune Kane informed me that

SODEVA was interested in supporting poultry raising activities in terms of providing the technical assistance and advice needed concerning the proper care and feeding of poultry. This was already being done in one other village in the district.

The farmer-initiated economic activity of investing in poorly nourished livestock, especially goats and chickens, for the purpose of fattening and eventually selling is an activity which could have tremendous positive impact on the rural development strategy as long as <u>minimum</u> external and expensive inputs are introduced.

APPENDIX H

EIGHTH INTERIM REPORT

SAHEL PROJECT

OF THE

AFRICAN-AMERICAN SCHOLARS COUNCIL

GRANT NO. AID/afr - 1162

Dr. Elliott P. Skinner
Principal Investigator

INTRODUCTION

Research Hypothesis:

The basic thesis undergirding the research conducted in Senegal, Niger and Upper Volta was that farmers and herders faced with a situation of severe environmental stress such as drought would devise strategies for survival. These strategies would represent adaptive mechanisms and modified behavior as responses to the drought.

Methodological Overview:

The task of Ms. Ware and Mr. Waldstein in Senegal, Ms. Hemmings in Upper Volta, and Mr. Sutter in Niger, was to test the above hypothesis.

The methodological approach in each field situation was basically the same. Each field researcher began by acquainting country officials at the national, regional, and local levels with the purpose and aims of the research project. Each researcher worked with an African counterpart. Out of these communications with government officials, each researcher selected a research zone and proceeded to test out the hypothesis that farmers and herders faced with a situation of severe environmental stress, such as drought, would devise strategies for survival.

Some Preliminary Findings:

The reports received to date from each field site,

support the hypothesis. Each researcher has submitted findings which indicate modifications in the production behavior of farmers and herders.

I. The Senegal River Region : Kassak Nord and Kassak Sud

Abe Waldstein worked among Tukulor farmers and Fulbe herders in Kassak Nord and Kassak Sud. The national development agency responsible for raising the level of productivity in the region is Societe d'Amenagement et d'Exploitation des Terres du Delta (SAED). According to Waldstein, the drought accelerated the growing interest in irrigated farming by the Fulbe herders. He makes the following observation:

> "The Fulbe, in spite of the experiences of the settlers, are increasingly participating in tomato production. Tomato cultivation may be seen as simply another hedge against the failure of their principal resource, cattle herding, to meet their subsistence needs. It becomes a first choice alternative because the opportunity cost is so low even though the returns have been discouraging. Migration, the choice of the settlers, would take the Fulbe out of the zone and out of touch with the welfare of the herds, an alternative far more risky than tomato cultivation. In the last decade, the Fulbe have seen their primary recource severely undercut, as the mainstay of their welfare. Their interest in cultivation, in general, is no longer merely to retain access to their historical pasture lands. (The drought has apparently converted many of them, in a much deeper sense, to mixed farming.) They are very anxious, for example, that SAED proceed rapidly to prepare a polder for their exclusive use. Sharing the polders of Kassak Sud has brought its inevitable conflicts. The veterans feel they have little enough land for their own use, let alone to share with outsiders."

The acceleration of interest in irrigated farming by the Fulbe herders is an adaptive strategy or buffer between

economic stress and dwindling herds and seems to be a growing trend. This initial commitment ot farming takes on added significance, due to the fact that the Fulbe have invested in year-round permanent dwellings. According to Waldstein, "some are even talking of experimenting with mud, brick or cement block dwellings."

A second trend which seems to be a distinct pattern growing out of the drought is out-migration from Kassak Nord. Waldstein points out that:

> "The field survey conducted in Kassak Nord elicited the names of 77 householders who had removed their families from the village since their arrival in 1966. The peak years of removal were 1968 and 1969, immediately following the first of the disastrous harvests, and between 1972 and 1975, the most difficult years of the drought. All but 23 of the departing families returned to their home areas up-river. The 23 exceptions went to the urban areas. Many found regular employment there. Six went to Dakar, four to Saint-Louis, four to Richard-Toll and three Nouakchott. Many of these 77 householders who had removed their families from Kassak Nord, retained their cultivation rights in the polders, although it has proven impossible to determine how many activate those rights from year to year."

The reason for this migration from the village to commercial centers is the search for non-farming income-producing activities to supplement income from the farm harvest. Non-farm activities are not new to the residents of Kassak Nord and Kassak Sud. What was new was the attitude adopted during the drought years to physically abandon the village in search of more flexible opportunities for making money. As Waldstein points out, abandonment is not total, since the

household head attempts to hold onto his cultivation rights in the following manner:

> "Every year, he returns to Kassak Nord to sow the rice. He may stay long enough to do a first weeding. He then leaves only to come back for harvesting. He stays in the village house assigned to his family and eats with friends or subscribes to a bowl prepared by one of the village women for about $10.00 a month. Friends watch over his plot in his absence and they send him a message if his presence is required. His harvest, for lack of proper care, may be smaller than average, but he will have acquired a handsome resource supplement for a minimal investment."

Waldstein makes the point that the household head's harvest may be "smaller than average" due to poor husbandry, but that fact is seemingly outweighed by the potential for making money in non-farm activities, especially petty and ininerant trade.

Kassak Sud also experienced out-migration during the drought years. Waldstein said that it is quite common for a householder in Kassak Sud to relocate his family to one or another of the major towns in Senegal; and then come to Kassak Sud only for the first and last field operations of the rice cultivation season. During the tomato season, the householder either forgoes tomato cultivation altogether or hires someone to take his place in his producer group. In effect, he rents out his access rights, acquired as a member of the cooperative, to a non-member, usually a local Fulbe adolescent or an itinerant Moor or Tukulor agricultural laborer. The householder demands one-third of the crop, if

the laborer provides his own subsistence during the season, one-half if he does.

According to Waldstein, the field survey conducted in Kassak Sud elicited the names of 61 householders who have removed their families since 1966. As in Kassak Nord, the peak years of removal were 1968 and 1969 and from 1972 to 1975. Only 9 of these families went to the rural areas. Twenty-four went to Dakar, seventeen to Thies, four to Saint Louis and three to Richard-Toll. Many have found employment in these areas while they continue to exercise their cultivation rights in the polders, either in person or through delegates either hired or chosen through family ties.

Seasonal migration by household members from village to commercial centers for the purpose of supplementing farm income, was a way of making ends meet from one harvest to the next, before the drought years. During and since the drought years, migration has assumed a more permanent status, whether it is seasonal or permanent. A pattern of farming is adhered to in that farming a piece of land is not totally abandoned. Migration to a commercial center on a permanent or seasonal basis, places the farmer or herder in a more varied environment for the purpose of supplementing his farm income.

II. The Diourbel Region : Darou Karim

Ms. Ware has also documented a migration pattern out of the Wolof Farming village of Darou Karim. During and

since the drought, migration was almost village-wide and seasonal. Also during the drought years, increasing numbers of compound heads began to invest in some type of thatched roofed or zinc roofed dwelling in the religious and commercial center of Touba. These were used to house compound families during the non-farm season. A primary problem in the village during the non-farm or dry season, is the lack of water. An equally primary problem is the lack of enough food and cash to last from one season to the next. Compound heads took the position that easy and consistent acess to water and the possibilities for making some money on a daily or weekly basis, was not possible in the village after harvest.

Semi-permanent establishment through out-migration into the commercial center of Touba was viewed by compound families as a viable survival strategy. This farmer-initiated strategy of adapting to the severe and pressing problem of water and food shortage, clashes head-on with the rural development strategy being implemented by Societe de Developpement et d Vulgarisation Agricole (SODEVA), the development agency for the peanut basin. From the SODEVA point of view, this seasonal absence of farmers from the land, which they actually farm, creates a problem for the dissemination of technical and educational information. Traditional technical exploitation of the land has meant inefficient utilization of land and poor weeding practices contributing to poor production yields. The inefficient utilization of manpower has visibly

resulted in the hiring of seasonal harvesters from the Casamance, each harvest. The agricultural technical package consists of a hoe, plow, fertilizer, and improved seeds, has for the most part been beyond the financial reach of most small farmers in the village. Full participation would mean assuming a great risk in an environment with erratic rainfall. The cash outlay or credit commitment is not considered to be a viable way of maximizing resources from the point of view of the small farmer.

Experience has taught the Darou Karim farmer that he has more control over his income-producing potential in the commercial center of Touba, during the dry season, than at Darou Karim. The seasonal village exodus is viewed by the villagers as well as by some development officials, as being an irreversible trend. It is a trend which had its beginnings in the drought years. It parallels the migration pattern discussed by Waldstein for Kassak Nord and Kassak Sud in the sense that a commitment to the land is retained, but in the strictly economic and kinship meanings of land tenure.

III. The Deckvotte Fulani of Northern Senegal

The Fulani in the Deckvotte zone of Senegal are semi-sedentary herders. The most conspicicuous new subsistence behavior was the entry into the cash crop economy of peanut farming. There was an exception of one compound head who confided his share of his father's inheritance to his younger brother

(upon his father's death, many years ago), so that he could pursue his interests in livestock trading and farming. Cash crop farming came to the zone between 1966 and 1973, which was the period of the drought. Herd managers who transhume were unable to, and more importantly, uninterested in participating in growing peanuts or millet; but did assign an older son the responsibility of clearing a plot and planting the seeds. The compound head is responsible for obtaining the seeds from ONCAD, which is 100 kilos for the compound head and 50 kilos for each taxable male and female.

Some of the men now growing peanuts had never used farm tools before. Millet farming has been viewed as an activity engaged in to supplement the diet, rather than as an economic occupation which is how peanut farming is viewed. The theme repeated throughout the zone concerning peanut farming was that it was resorted to out of sheer poverty. The disdain for farming is widespread and viewed as a temporary and stop-gap activity --an activity to be tolerated until the drought-diminished herds are reconstituted. In the meantime, peanut farming is viewed as a hedge against selling animals from a drought diminished herd in order to meet cash needs.

Entry into the cash crop economy would seem, on the surface, to draw the Fulani within the orbit of the agricultural modernization strategy, since they would have to interact, however superficially, with ONCAD and SODEVA. In 1976,

it was clearly observable that Deckvotters were not knowledgeable about peanut farming. A good index of this was the low millet and peanut yields. It is true that a genuine lack of interest in farming may partially account for low productivity, but haphazard and late planting, as well as negligent weeding practices, insects and rats (exterminating services and measures are provided in the agricultural zones), took a toll on crop yields. During the rainy season of 1976, no rural extension worker representing agricultural agencies paid a visit to the zone.

According to Ms. Ware, a development official at SODEVA stated that an investment in time and personnel in Deckvotte Fulani zone for agricultural development would present a problem, because the transhumance cycle of the herders does not mesh well with the yearly agricultural cycle recommended by SODEVA.

Though SODEVA may have been slow to embrace these "new farmers", it very wisely utilized the knowledge and skills of recommended zone residents in the initial stages of its draft oxen program for the agricultural zones. Farmers in the agricultural zones generally had no experience with these particular animals. Breaking the animals in - yoking them - training them to respond to the simple work commands and allowing them to get adjusted to walking yoked together, often frustrated Wolof farmers, who would strike a protesting beast who refused to stand up. Fulani herdsmen never found

it necessary to strike these animals (they considered this to be cruel and unusual punishment) and worked skillfully with SODEVA in training them to yoke.

The point of Ms. Ware's discussion of the utilization by SODEVA of the skills and experience of Fulani herdsmen with animals for the draft oxen program, is that indigenous human resources and skills were tapped in the interest of national development strategy for farmers. The accessibility to this resource bank among the Fulani, was due to the willingness of the Fulani to seek new alternative income-producing activities as measures against selling animals from drought diminished herds for ready cash.

Important to be noted as a measure of the commitment to keeping drought diminished herds intact, is the increasing investment in permanent dwellings in the villages. Before the drought, herdsmen generally left dwelling construction to their wives and female kin. These dwellings were fragile and of a temporary nature; constructed mostly of millet stalks and small tree branches. Between 1973 and 1976, many compound heads invested in cement and bricks for the construction of permanent dwellings. Their reason for this was that, except for herd managers, the compounds have been occupied on a year round basis, since the drought. Smaller herds have meant the combination of family herds for the yearly transhumance cycle between January and June, thus requiring fewer herd managers

and shepherds during this period.

A. Migration and Adaptation

According to Ms. Ware, flight or migration out of the zone on a permanent basis as a response to drought was not seriously considered by the Fulani herders. There was some movement from the zone to the nearby town of Dahra. Four compound heads moved to the town of Dahra with their immediate families. Each continues to be listed officially as a tax-paying member of their village and their animals remain with the larger compound herd in the village. Each compound head who moved permanently to Dahra, felt that he could better provide for his family if he pursued petty trade activities on a full time basis in the town of Dahra.

There was also a migration from the village by nine compound families to a grazing zone south of the village. These families lived close to the national livestock research center, whose grounds were off limits to grazing animals. Animals from these family herds were frequently confiscated by officials of the livestock research center and fines exacted. The families migrated out of the village because they felt that grazing land was "shrinking" in the areas surrounding the village.

B. Economic Survival Strategies

Having decided that flight was not the best response

to survival during the drought, economic strategies which meant crossing ethnic occupational boundaries, such as cash crop farming, petty trade, small and continuous trade, and local commerce, were the principle hedges against the sale of animals from drought diminished herds.

Trade in livestock, poultry, gum, amulets and tradi-
5/ itional medicines, and dead wood are not new economic activities; but traditionally had not been engaged in by the Deckvotters. They considered for example, the exploitation of gum trees and the sale of the gum to be an economic occupation of Moors.

Trade in livestock seem to rate the highest among small trade occupations and was the most usual type of strategy in operation as a strictly non-herding activity. The non-herding income producing activities were considered by the Deckvotte to be temporary measures against further decreasing their herds. The Fulani herders expressed the opinion that they engaged in farming and trade activities not generally associated with Fulani herders of Deckvotte because of poverty.

Ms. Ware feels that the emergency of these activities as survival strategies heralds the beginning of changes in subsistence behavior. The zone trend is toward increasing sedentarization. There is the obvious investment in the permanent housing and the investment in cash crop farming

which has modified and restricted movement in the zone for herd animals. Ms. Ware further feels that the response by development planners to this sedentarization trend, will depend on the commitment of the Senegalese government to the livestock sector of the economy.

IV. The Gourmantche of Upper Volta

The analysis of the Hemmings report for Upper Volta, revolves around the way in which international drought relief activities served as a means of integrating the village into a modern structure for Gourmantche farmers and herders.

One of the most important points made by Ms. Hemmings is that extreme food shortages pushed the Gourmantche farmer to seek economic alternatives for survival, both within and outside the subsistence farming system. The farmer started to place more importance on hiring himself out as a laborer, investing in small consumer shops, and using more advanced farming techniques.

A. First, the report informs us that drought relief projects had a great impact on the Gourmantche area, because they provided temporary jobs. It is quickly pointed out, however, that these temporary jobs as paid laborers did take the small famer away from farming at the most important periods in the agricultural cycle.

B. According to Ms. Hemmings:

"Many young men, though remaining peasant farmers, started

businesses as shopkeepers. New roads gave them easier access to markets were manufactured goods could be bought. More important, the roads allowed businessmen to bring manufactured goods to the villages with greater regularity. The increase in demand brought on by the increase in population with access to money, made selling profitable.

Other men chose to open 'restaurants' to feed the growing number of strangers that presented themselves at the market, while older men sought to increase their cereal production."

The desire to increase cereal production by some heads is viewed by Ms. Hemmings as a response to severe grain shortages, exacerbated by the drought.

C. She goes on to state that:

"Drought still threatens the villagers and so it is considered prudent to have as much of a reserve stock as possible. In addition, because of the growing demand for grain in urban centers, an increasing number of merchants are finding their way to the villages, in search of surplus grain. Older people see millet not only as a source of food, but also as a source of income. The pressure to create a surplus is great. Villagers respond to this pressure by trying to increase their food production. However, because of the low level of technology, the inaccessibility of surplus labour and the lack of scientific farming techniques, expansion of food production is difficult. Villagers have shown receptivity to advanced technology in all other areas. Yet, although they are conscious of new methods and have specified their needs in this area, farming technology has lagged far behind."

D. Comparative Field Reservations

Ms. Hemmings points out that the Gourmantche villagers are seeking ways of increasing and expanding their income potential. This because their level of farming technology does not permit yields high enough to provide enough food and cash income to see them from one season to the next. Both

Waldstein and Ware have reported the search by farmers to carve out more ways of earning money outside the subsistence farming system.

Just as farmers and herders in the research zones of Senegal have increasingly committed themselves to small trade activities in towns near and far from their villages, so have Gourmantche farmers in the Upper Volta research zone done the same.

D. Changing Trends in Subsistence Behavior

The reports indicate clearly changing trends in the subsistence behavior of farmers and herders in the research zones. Farmers seem to be devoting increased amounts of time to non-farm activities as a way of increasing their cash resources. From the point of view of some development officials, this has serious negative consequences for increasing production yields. Herders, as a result of drought diminished herds, are searching for ways to make money which would not entail the sale of animals from drought decreased herds. In some instances, this has meant entering the cash crop farming system and in other, it has meant increasing activity of petty trade in commercial centers. In either case, the herder is more sedentarized now, than he was before the drought. The trends seem irreversible. Drought recover and rehabilitation projects should take into account, the feasibility of projects based on new trends in the subsistence behavior of farmers and herders in the research zones.