

PNA BF-005

65955

LAND TENURE REFORM IN SENEGAL:
AN ECONOMIC STUDY FROM THE PEANUT BASIN

by

Elise H. Golan

All views, interpretations, recommendations, and conclusions expressed in this publication are those of the authors and not necessarily those of the supporting or cooperating organizations.

TABLE OF CONTENTS

	<u>Page</u>
Preface	vii
Chapter One: Introduction	1
A. The Objective	1
B. The Peanut Basin: Setting of the Study	1
C. Farming Systems in the Basin	2
D. Sample and Questionnaire	5
Chapter Two: The Experience with Individualization	9
A. Colonial Land Law	9
1. French Civil Code	9
2. The Torrens System	9
3. The "Livret Foncier" System	10
B. Registered Agricultural Land in the Peanut Basin	12
1. Registered Parcel Descriptions: Case Studies	13
2. Characteristics	15
Chapter Three: The Law of National Domain	19
A. The Law of National Domain	19
B. Tenure Rights at the Compound Level	22
1. Right of Access to a Parcel of Land	25
2. Right to Determine Heirs	28
3. Right to Give Land (Right to Sell)	28
4. Right to Mortgage	29
5. Right to Rent or Lend	29
C. Land Stewardship	32
D. Land Allocation	38
Chapter Four: The Village Section Social Accounting Matrix	41
A. The Accounts	44
1. Endogenous Accounts	44
2. Exogenous Accounts	47
B. Outline and Specifics: Structure of the Village Economies	47
1. Comparison of the Socioeconomic Structure of the Two Village Sections	47
2. Comparison between Secure, Moderately Secure, and Insecure Field Managers	48

Chapter Five: Conclusions	51
Bibliography	53
Appendix One: Questionnaire	59
Appendix Two:	95
Table 1: Land Areas per Compound, Keur Marie	97
Table 2: Land Areas per Compound, Keur Magaye	98
Table 3: Animal Stock: Animals Owned, by Each Compound Type	99
Appendix Three:	101
Table 1: Social Accounting Matrix, Keur Marie	103
Table 2: Social Accounting Matrix, Keur Magaye	109
Table 3: Normalized Social Accounting Matrix, Keur Marie	115
Table 4: Normalized Social Accounting Matrix, Keur Magaye	121
Appendix Four: Description of Each Block of Activity in the Social Accounting Matrices	127

LIST OF MAPS AND TABLES

		<u>Page</u>
Map 1.	Republic of Senegal	3
Table 1.	Social Characteristics by Village	23
Table 2.	Who Can Take the Field	25
Table 3.	Who Cleared the Parcel	26
Table 4.	How the Parcel Was Obtained	27
Table 5.	Can the Compound Head Give Compound Fields?	28
Table 6.	Land Reallocation by Village	29
Table 7.	Land Improvements	33
Table 8.	Reason the Parcel Was Left Fallow	35
Table 9.	No Rotation for Three Years	37
Table 10.	No Rotation for Two Years	37
Table 11.	Number of Compounds That Had Borrowed or Lent Parcels	38
Table 12.	Ratios of Land per Compound Member	39
Table 13.	Relationship of Manager to Compound Head and Degree of Security	44
Table 14.	Hectares by Crop and Field Security	49
Table 15.	Value of Land Services per Hectare	50

PREFACE

This study is part of the Land Tenure Center's comparative program of research on security of tenure and land registration initiatives in Africa. This four-year research program has been carried out under LTC's Cooperative Agreement (ACCESS I) with AID's Bureau of Science and Technology and has involved a year or more of fieldwork in Somalia, Senegal, Uganda, and Kenya, short-term work in other countries, and an extensive literature review. It has sought to understand, through study of a number of titling initiatives, the actual impacts of such programs. It is in the light of this experience that future proposals for titling programs must be evaluated rather than solely in terms of a potential indicated by theory. Experience in the end suggests modifications to our theoretical models, more rigorous statement of their assumptions, and an understanding of how far these assumptions apply in the cases which concern us.

Funding for the Senegal research was provided by AID's Africa Bureau from Strategic Studies funds and by the Bureau of Science and Technology. The Land Tenure Center appreciates the interest and support of many in AID/Washington, including David Atwood, Michael Yates, and Gloria Steele in the Bureau of Science and Technology; Pat Fleuret, Gerald Cashin, and Curt Reintsma in Africa Bureau; and Joan Atherton in PPC; and in USAID/Senegal, that of John Baliss and Wayne Nilsestuen.

The study was carried out by Elise Golan, accompanied by Amos Golan. Our thanks to her advisor at the University of California-Berkeley, Professor Irma Adelman, for her cooperation and advice. In Senegal, research assistants were Birane Diop, Pape Senghor, Ndao.

Several LTC staff have assisted in the planning of the research and provided comments on drafts, including Carol Dickerman, Peter Bloch, and Michael Roth. In Senegal, LTC gratefully acknowledges the assistance of the Institut Sénégalais de Recherches Agricoles which provided an office base in Kaolack.

Our thanks to the author, and all those concerned.

John W. Bruce, Project Coordinator
Security of Tenure/Land Registration

11

CHAPTER ONE

INTRODUCTION

A. The Objective

The history of land-tenure reform in Senegal involves numerous attempts to replace the customary system of land tenure with a state-initiated system. The French colonial government made an effort to impose the French Civil Code and then to establish two separate, private registration systems. The independent government of Senegal initiated its own attempt at reform on 17 June 1964, with the Law of National Domain. With this law, all land that had not been registered became part of the National Domain and hence became State property. Only a small percentage (no more than 2 percent) of land in modern Senegal is officially registered. As a result of the uneven and incomplete application of the Law of National Domain, the majority of farmers in Senegal hold land under varying forms of customary law, with some forms more influenced by the provisions of the Law of National Domain than others.

The objective of this study is to determine the degree of land-tenure security afforded by the different tenure arrangements in Senegal and then to investigate the effect of tenure security on the land-management practices of farmers in Senegal's Peanut Basin and on the socioeconomic structures of the sample areas. In the first section of the paper, the sample area and the farming system found in the area are described. This is followed by an outline of the questionnaire and a description of the sampling technique. In Chapter Two, colonial efforts to impose a system of individualized land registration are discussed, and the characteristics and land-management practices of the most secure farmers in the sample, those with registered land, are examined. In Chapter Three, the stipulations of the Law of National Domain are presented. This is followed by an examination of the tenure security of the farmers in the two sample-village sections. It is found that the farmers in one village section have relatively less tenure security than those in the other. This chapter concludes with an investigation of the role of tenure security in the land-management practices of the farmers in the two village sections. Chapter Four examines the influence of tenure security on the socioeconomic structures of the two sample-village sections while Chapter Five presents conclusions and policy implications.

B. The Peanut Basin: Setting of the Study

The majority of Senegal's population lives and farms in the Peanut Basin. This region, the heart of agricultural Senegal, extends southward from Louga to Kaolack and eastward from Thiès to Tiaf, and broadly follows the distribution of peanut production in Senegal (see map on p. 3). The inhabitants of the Basin are predominantly Wolof and, secondly, Serer, though Peul, Lebou,

Malinke, Toucouleur, Nouminda, and Bambara are present throughout the region. As of 1980, population densities in the Basin ranged from 30 to 40 people per square kilometer in the north and east, to approximately 100 people per square kilometer in the south-central districts.

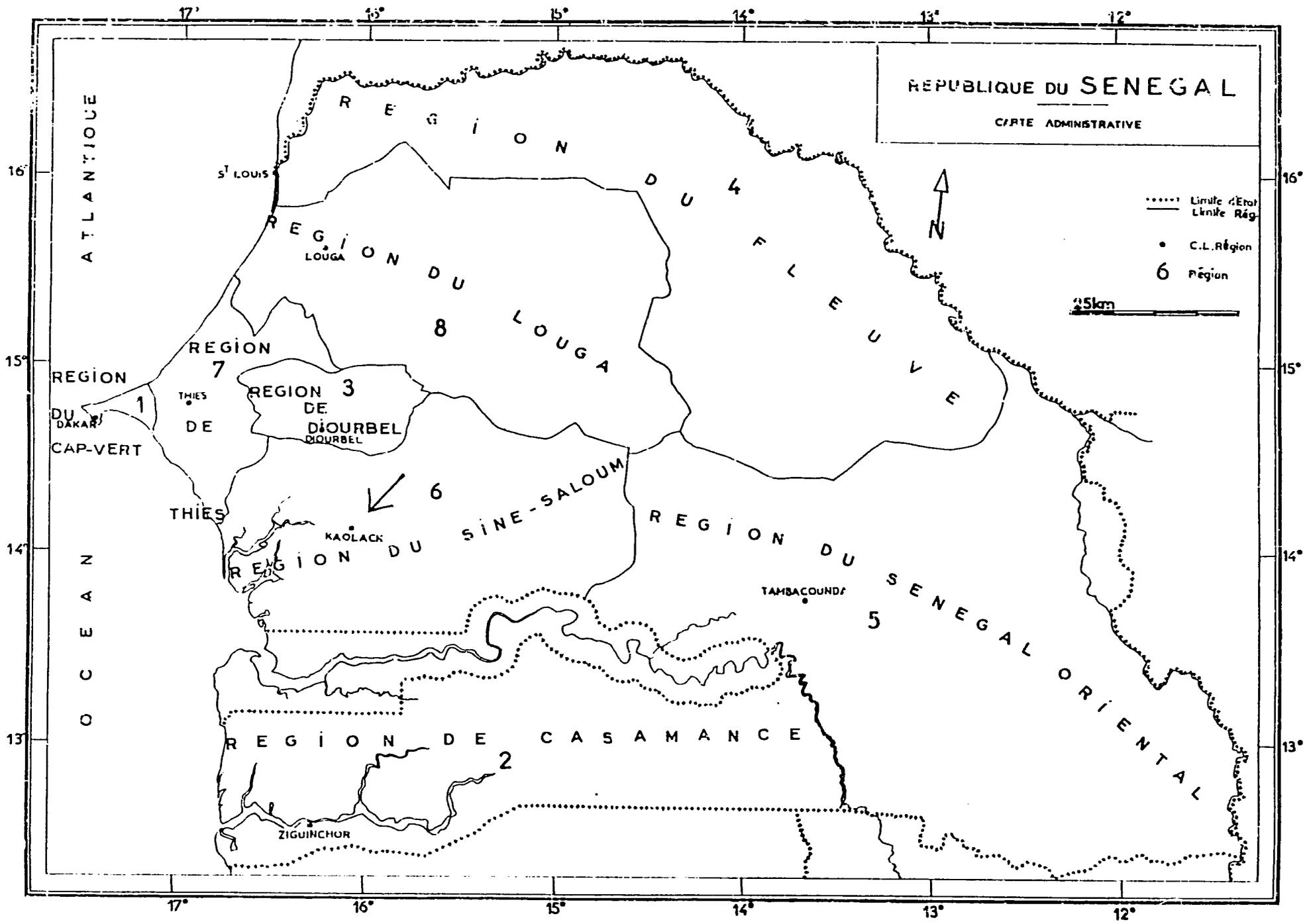
Peanuts and millet are the predominant crops in the Basin. For the country as a whole, the division of crop area in 1986 was peanuts, 47 percent; millet/sorghum, 44 percent; rice, 3 percent; maize, 2 percent; cotton, 2 percent; and cowpeas, 2 percent. Eighty percent of Senegal's population depends on agriculture for its livelihood, and in the Peanut Basin this number is certainly higher.

Despite the continued importance of agriculture in Senegal's economy, the ability of farmers to support themselves has become increasingly precarious. Two-thirds of Senegal's landmass lies within the Sahel and due to drought and animal and human population pressure, even this marginal land is deteriorating. Between 1960 and 1987, average rainfall fell five different times below the minimum necessary for successful peanut, cotton, sorghum, and maize crops. Since 1970, average rainfall has dropped to half of what was previously considered normal. Satellite pictures show that since 1977, the northern limit of vegetation has been pushed south by 200 kilometers. Each drought does irreversible damage: water tables drop, streams dry up, salinization occurs, and the environmental balance is slowly tipped. The Peanut Basin is one of the areas that has suffered the most from environmental degradation; the economic base of Peanut Basin farmers is being slowly eroded away.

C. Farming Systems in the Basin

Historically, land in the Basin was claimed by the first settlers by right of their having cleared it by fire. These men became known as the "masters of fire" or the "borom daye" (Wolof). They usually claimed vast areas of land cleared by up to six days of burning. Being unable to cultivate all of their holdings themselves, these men accorded use rights or "rights of hatchet" to men who could cultivate the land. Once given use rights, the "master of hatchet" or "borom n'gadio" (Wolof) had incontestable, irrevocable rights to that land as long as he paid yearly homage to the master of fire. Usually this annual payment was symbolic (an ear of millet, for example), but in different areas and at different times in the Basin's history, the homage payment became a substantial portion of the year's harvest. Rights of fire and hatchet were (and still are) passed from father to son. In the area of the Basin where the land-tenure study was conducted, farmers reported that the right of fire had died out during the time of the French and that only the right of hatchet remained.

Farm production in the Basin is organized at the compound level. The compound consists of one or more households. The nucleus of the compound is typically one male who has right of hatchet and his household (wives, children, older parents, aunts, sisters, unmarried male relatives, and so on). This male with right of hatchet is not only the head of his household but also the head of the compound. Other households in the compound are headed by married brothers, sons, or cousins of the compound head. These secondary households are broken into two categories: independent and dependent households. The



primary distinction between the two types of household is that independent households prepare their own meals and are responsible for meeting their own millet needs. The position of head of the compound, along with land rights, is passed from father to oldest son. If the oldest son is unable or unwilling to assume control, responsibility is passed to the most appropriate male (or occasionally female) relative. If male children have access to job opportunities or land outside of their father's land (through other relatives or government grant), they can leave their natal compound to form their own.

The compound head is responsible for distributing compound land between millet and peanut crops. He oversees the compound's millet fields and has the ultimate responsibility for assuring the food needs of the compound. If there is an independent household in the compound, the head of this household also oversees a millet field in order to supply his own household's grain needs. The millet flow between the compound and independent member households seems to be fluid, with transfers taking place in both directions. The relationship between the compound and independent households varies from case to case.

After allocating enough land to millet production, the compound head distributes the remaining land among the various compound members. Occasionally, land is set aside for manioc, vegetables, and condiments. Wives, unmarried older members (called sourga), older male children, heads of households, brothers, cousins, aunts, uncles, and so forth, can all be allocated land to cultivate for their personal benefit; peanuts, the government-sponsored cash crop, are usually the crop of choice. The compound head also cultivates a peanut field for his own cash needs. Peanut and millet fields are usually rotated on a yearly basis so that from one year to the next, compound members do not know which fields they will be allocated for their personal peanut crops.

All compound members donate labor to the compound's millet fields, but assuring enough labor for the peanut fields is usually the responsibility of each field manager and labor swaps within the compound are arranged on an individual basis. Labor swaps also take place between compounds and hired labor is occasionally employed.

Two types of hired labor are common in the Peanut Basin. One type is the firdou. The firdou travel around the basin supplying supplemental labor as needed. They are usually paid in cash and given food and lodging for the duration of the labor contract. Navetanes are the second type of hired labor. These men hire out their labor in return for the loan of peanut seeds and a parcel of land. Traditionally, navetanes work on the compound fields in the morning and on their personal peanut fields in the afternoon. At the end of the season, they repay the peanut-seed loan with interest. Navetanes live and eat with their host compounds during the growing season and then return home during the dry season. Navetanes usually have ongoing relationships with a compound, returning year after year to the same place.

Inputs such as seeds, pesticides, and fertilizer are acquired by the compound in a number of ways. Up to and including 1986, the year of this study, farmers had access to government-provided peanut seed (which included pesticide) distributed on credit through the farmers' cooperative. With this system, farmers received the peanut seed and pesticide at the beginning of the

season, and after harvest they were responsible for repayment with interest. As heads of compounds and, sometimes, heads of independent households were the only compound members with access to peanut-seed credit, it was their responsibility to determine the allocation of this peanut seed and pesticide among the other compound members who wished to plant peanut fields. Peanut seed is also available on the open market and, of course, some farmers reserve seed from year to year (though this practice cannot be continued over a long period of time due to the eventual deterioration of seed quality). Pesticide and fertilizer are both sold on the open market, though fertilizer is extremely expensive and relatively difficult to obtain.

Tool use in the Basin is restricted primarily to horse- or donkey-pulled plows and small hand-held implements. The iler, a metal, arrow-shaped piece attached to a long stick, is the most popular tool in the area. It is used principally for weeding but has many other uses as well, from field preparation to seeding and harvesting.

D. Sample and Questionnaire

Every region in Senegal is broken into administrative units called village sections, each of which is governed by a rural council. Depending on the population density of an area, these sections are composed of one or more villages. At the village section level, land and inheritance disputes are decided by the elected rural council.

For the sample of compounds with National Domain landholdings, two village sections in the Peanut Basin were chosen, primarily on the basis of logistical criteria. Each section is less than an hour's drive from the huge daily market at the regional capital of Kaolack, and each section is within walking distance of a large weekly market. The sections were chosen so that a number of marketing opportunities would be readily available to the farmers. The proximity to Kaolack was also important in order to facilitate site visits and transport enumerators. The sample sections, Keur Marie and Keur Magaye,¹ were also selected so as to reflect the variation in population density in the Peanut Basin. Keur Marie is located to the west of Kaolack, where population densities are highest, while Keur Magaye lies to the east, where population densities are at their lowest.

A list of compound heads for each section was acquired from the section's extension agents. Compounds were then chosen randomly from the list, with approximately one-third of each section's compounds chosen for the study. This corresponds to twenty-two compounds from Keur Marie and twenty-six from Keur Magaye. Interviewing was conducted from January 1987 to May 1987, the agriculturally slow period in the Peanut Basin. Data were collected as soon after harvest as was feasible given the time constraints of the compound and the availability of the enumerators.

1. Three compounds from the adjoining section of Keur Ismaila are included with the compounds of Keur Magaye.

Three enumerators were hired for the study. Each had extensive experience doing agricultural survey work for the Institut Sénégalais de Recherches Agricoles. Their input was invaluable. Enumerators lived in the study villages during the week and returned to Kaolack and their families on the weekends. The length and depth of the interviews required that the enumerators be on call from morning until late evening in order to take advantage of the spare moments of the various compound members.

The interviews for the National Domain lands in the Peanut Basin study were organized at four different levels. (A copy of the questionnaire with an outline of the levels is found in Appendix 1.) The first level of interviewing was conducted with the compound head and involved a general assessment of the compound: human characteristics, capital stock, extra-agricultural income, food grain purchases and gifts, and the compound head's impression of the Law of National Domain. To avoid biased answers on tenure claims, the questions concerning the National Domain Law were kept for the last day of interviewing. The first level of interviewing involved at least two interviews.

The second level of interviewing was again conducted with the compound head and focused on mapping the land holdings of the compound. The compound's parcels were enumerated and the tenure history of each parcel was taken.² If the parcel was fallow, length and reason for fallow period were taken. The size of each field was also taken and the name of each crop and field manager noted for the next round of interviewing. In all cases the compound head readily identified the field manager. This level of interviewing often involved numerous interviews due to the time-consuming tasks of visiting and measuring each field.

The third round of interviewing was addressed to the field manager, who besides controlling the distribution of the product of a field, was more often than not responsible for the actual input management for the field in question. When the field manager did not oversee field management, the true field overseer was identified and interviewed jointly with the field manager. During this round of interviewing, questions were asked concerning crop and input management, and the tenurial rights of the manager over the field were assessed. Depending on how many managers were in the compound, this level of interviewing could also prove quite lengthy.

In the fourth and final round of interviewing, each manager was asked about the distribution of the portion of each crop or the portion of the revenue gained from each crop that he or she controlled. Once the income of each

2. In the sense used here, parcel denotes a continuous landholding bordered by someone else's land. Field is used to denote separate crop areas or separate manager areas within a parcel. For example, a large parcel that is planted in peanuts only might in actuality contain three different fields; one area of the parcel might be managed by the compound head, another by his first wife, and another by his second wife. Or a single parcel could be broken into millet and peanut fields, both managed by the compound head. The title of manager denotes the compound member who owns or has responsibility for distributing the product of a field.

member of the compound was established, he or she was asked how the income had been spent, that is, what services or consumption or investment goods had been purchased. This information was collected for general categories of goods and services; each orange or scoop of tomato paste was not enumerated. Each manager was also asked about the source and cost of seeds, pesticide and fertilizer. Again, depending on the number of managers, this level of interviewing could require numerous visits to the compound.

The organization of the questionnaire into four levels proved very successful in deciphering the production logic of the compound. In an effort to obtain the most accurate information on field cultivation and output, interviews were conducted not only with compound heads (as is generally the case) but also with individual field managers. The fact that both individual managers and compound heads were interviewed about field use and tenure security also allowed for crosschecks on the data. When discrepancies arose, the enumerator returned to the compound to resolve the differences.

For the sample of registered holdings in the area, every titleholder who could be located was interviewed. Working from lists taken from the Cadastre Office in Kaolack, the capital of the Peanut Basin, and crosschecking with files in the National Domain Office there, only eleven registered tracts of agricultural land could be located within the Basin. Although the National Domain office curtailed access to registration records soon after research was begun, the number of registered farmers in the area is probably not much greater than the eleven found, since only 2 percent of all Senegal's land was registered prior to 1964. Because so few registered parcels existed in the Basin and because many of those found were obviously special cases, the interviewing process outlined above was not followed for the registered parcels. Instead, the history and current status of each parcel was compiled.

CHAPTER TWO

THE EXPERIENCE WITH INDIVIDUALIZATION

Throughout the colonial period, the French government tried to establish a system of private land registration in French West Africa. For the most part, its efforts failed, but people who registered land under French law (during the colonial period or in the delay granted by the National Domain Law) retain legal title to their land. In order to give perspective to Senegalese land-tenure law and to the system of registration still existing in Senegal, a brief description of colonial law is given next.

A. Colonial Land Law

By the end of the colonial period, the French government had established three legal tenure systems in their African colonies: the French Civil Code, the Torrens system, and the "livret foncier" system. Below is a description of the laws which codified each system. (All dates correspond to Senegalese [Afrique Occidentale Française] adoption of the law or decree in question.)

1. French Civil Code

On 5 November 1830, the French colonial government introduced the French Civil Code into Senegal with a law that stated that insofar as land transactions involved French people, French law governed. The French Civil Code was applied primarily in the communities of Dakar, Gorée, Rufisque, and St. Louis. This law was later amended by the law of 23 March 1855.

2. The Torrens System

In 1906, the French colonial government attempted to bridge the gap between French land law and customary land law by introducing a tenure regime modeled after the Torrens system of land registration. This system, or "Régime d'immatriculation," was adopted on 24 July 1906, and stipulated that any person who could produce an "administrative certificate," which stated rights of ownership as determined by the local colonial administration and a community of village notables, could apply for registration.

The decree of 26 July 1932, modified the law of 1906, the most important change being the authorization for third parties to pay off mortgages. This was done in an effort to make mortgage credit more secure. In recognition of the difficulty of imposing private registration, Article 19 of the 1932 Law stated that French Civil Code and traditional law were still valid if they did not contradict the present decree.

On 20 May 1955, the 1932 Law was amended in a number of important ways. First, the new law allowed for the registration of collective rights. Second,

it abolished the administrative certificate as a prerequisite for formal registration. (A new system to verify customary rights was envisioned, but the colonial government was disbanded before the system could be made operational. As a result, from 1955 to independence it was impossible for a Senegalese native to register land.) Third, with this law the French government relinquished right of ownership over land that was vacant or "without master." Traditional rights were assumed to exist and the French state could incorporate land into its domain only if it had proved that no customary ownership rights existed.

It is important to note that the laws of 1906, 1955, and in particular the law of 1932 still define the legal structure of registered landownership in Senegal. As was stated in the "Analyse du projet de loi soumis à l'avis de la Cour Suprême" (1964),

The decree of 26 July 1932, remains in effect. It should be recognized that since its provisions for registration via an "administrative certificate" have been suppressed, this decree no longer constitutes a land-tenure system but only a system of public recognition of real rights which has proved its value for a long time.³

3. The "Livret Foncier" System

Recognizing that land registration under the Torrens system was failing to gain a foothold, particularly with the indigenous rural population, but nevertheless convinced of the superiority of private property tenure over traditional tenure, the French colonial government devised a system whereby indigenous farmers could have their customary land rights officially recognized by the colonial government. On 8 October 1925, the French government enacted a decree to codify "un mode de constatation des droits fonciers des indigènes en Afrique Occidentale Française." This decree detailed the procedure by which an African citizen could have customary land rights recognized by the colonial authorities. With this new system, all rights and obligations over land remained customary but were "secured" by the colonial government. As opposed to registration where titles were inscribed in the Livret Foncier, customary rights were inscribed in the Livret Foncier. And unlike registered rights with the Livret Foncier, the claimant did not have absolute ownership but, nevertheless, could be displaced only through the legal process. M. Cardé, the Gouverneur Général de l'Afrique Occidentale Française at the time, described the law in these terms:

3. Original: Le décret du 26 juillet 1932 reste en vigueur. En effet, depuis la suppression de ses dispositions relatives à l'immatriculation en vertu d'un "certificat administratif," ce texte n'organise plus un régime foncier, mais seulement un système de publicité des droits réels qui, depuis longtemps, a fait la preuve de sa valeur. C'est grâce à ce système que seront publiés et conservés les nouveaux droits de propriété et les clauses qui les grèvent.

The new land title, which is not a title of ownership as specified in our code, is nevertheless destined to establish a type of cadastre of indigenous lands whenever needed. Its relationship to land registration is comparable to that of the organization of the indigenous civil registry (births, deaths, and marriages) to our civil registry.⁴

The "Régime du livret foncier" did not abrogate any of the other tenure systems which were operating at the time. In particular, Article 13 specified that the 1925 Decree in no way changed the 1906 Law on private land registration. The "livret foncier" system represented an intermediate step between traditional land law and the law of private property. It was an effort to make the first step toward land registration easier and less costly. But, like the "Régime d'immatriculation," this system, the "Régime de constatation des droits d'indigène," did not have great success.

In addition to the three tenure systems listed above, the colonial government passed numerous laws to codify its position on customary law. Four tenets characterize this position. First, France claimed ownership of all land that was vacant or without master. This notion was introduced as early as 1830 with the Civil Code, but was restated in a decree of 1900. Second, according to a law dated 20 July 1900, "the property belonging to the natives is governed by local customs and usages in all that concerns its acquisition, retention and transfer." Third, on 23 October 1904, the French government formally recognized the validity of collective land rights whether held by the collectivity in general or by the traditional chiefs as representatives of the collectivity. And fourth, on 16 August 1912, the colonial government passed a law that stipulated that colonial law replace traditional law when traditional law was "contrary to the principles of French civilization."

During the colonial period, the goal of the French government was to establish one system of private land registration for its colonies. But by the end of the period, France had established three legal systems of land tenure, with the vast majority of land being held under customary law. In Senegal, only 50,000 hectares were registered at the time of independence.⁵ In a letter to the French president, André Hesse, Minister of the Colonies, described the failure of the registration system:

4. Original: Le nouveau titre foncier, qui n'est pas un titre de propriété au sens de notre code, n'en est pas moins destiné à établir, au fur et à mesure des besoins, une sorte de cadastre de la terre indigène et est à l'immatriculation ce qu'est comparée à la législation de notre Etat Civil l'organisation de l'Etat Civil indigène.

5. The 50,000-hectare figure is from the Commission de Réforme du Régime Foncier, "Eléments et documentation pour une réforme agraire rurale foncière au Sénégal" (Dakar, 1960). A typographical error, since corrected in the copy of the report in the Archives Nationales in Dakar, inflated this number to 500,000 hectares. This incorrect figure was picked up and cited in a number of subsequent publications.

The system of real property based on registration has not yet been welcomed by the indigenous people as warmly as hoped, apparently because of the complexity and cost of the established procedures and because the regulations were sometimes contrary to their social norms.⁶

B. Registered Agricultural Land in the Peanut Basin

In the area of the Peanut Basin study, only eleven tracts of registered agricultural land were located. Although this number is small, these tracts offer an insight into the characteristics of titleholders and their land-management practices. In particular, three hypotheses concerning private land registration can be examined.

The first hypothesis is that private land registration is the ultimate form of tenure security and that the more secure the tenure rights, the more efficient the land-use pattern. The theory holds that farmers who are sure of their rights over land will be more industrious, knowing that the fruits of their labor will accrue to them or to their families. The costs and benefits of production are securely internalized in a single farmer. The farmer bears the cost of fertilizer, pesticide, labor, and management of the soil and therefore will apply inputs in the most efficient manner and will strive to preserve the value of the land. The farmer also enjoys all the benefits of a good harvest and will therefore work diligently and apply pesticide and fertilizer and rotate the crops to ensure the highest possible yields over the longest period of time.

The second postulated benefit of private registration is that it transforms land into a commodity and that where land has been commoditized, allocative efficiency will result. The bidder willing to pay the highest price is assumed to put the land to its highest valued use.

The third hypothesis is that through the mortgage of land, private registration permits farmers to acquire credit, which otherwise might be impossible to secure. Theory states that when land can be mortgaged, credit will result in productive improvements in land and greater use of purchased inputs, the net result being higher long-run yields.

Before beginning a general description of the characteristics of titleholders and examining the above hypotheses, a short description of each parcel will be given. Because there are so few registered parcels in the area, and because each one has an interesting case history, it is worthwhile to examine them individually. An attempt was made to visit each of the registered parcels

6. Original: Le régime de la propriété foncière sur la base de l'immatriculation n'a pas reçu des indigènes tout l'accueil qu'on en escomptait, par suite, semble-t-il, des difficultés qu'offre pour eux la complexité de la procédure établie et des frais qu'elle entraîne et, par suite, aussi des dispositions parfois contraires à leurs habitudes sociales que comporte cette réglementation.

and speak with the owner. If the owner was unavailable, the village chief was contacted for information concerning the parcel.

1. Registered Parcel Descriptions: Case Studies

Title #1401 11.84 hectares

Thiendella Fall bought (592.13 FF) and registered this land in 1934. He was the first big farmer in the area. He served in the French military and held positions in the colonial government, receiving the Medal of Merit for Agriculture and eventually being named chef de canton. His landholdings totaled more than 70 hectares, but he chose to register only 11 hectares, the area where he had his house, tree nursery, and shop. Now the land is managed by all of his children. The oldest son has the final authority, but everyone in the family has a say. The land is still registered in the father's name and they have no interest in getting the title changed.

Title #2277 603.64 hectares

El Hadji Ibrahima Niasse (a marabout, or Muslim religious leader) registered this land on 14 November 1950. On 17 August 1955, he mortgaged the land for 1,200,000 CFA at 5 percent annual interest. On 20 May 1960, the bank repossessed the land. Apparently he managed to reach an agreement with the bank because he and his sons are still working the land. It was impossible to speak to Marabout Niasse or his descendants about the land.

Title #2494 19.26 hectares

The Cadastre Office lists this parcel as owned by Mamadou Diallo, but the Domain Office says that this land is owned by the Senegalese State and being developed (mise en valeur) by Diallo. The State registered this land on 7 February 1952. Diallo cultivated tomatoes for commercial production on the land and apparently had some outside financing. After the tomato business collapsed, he grew apples, oranges, and tangerines, all for commercial production. Now his youngest daughter manages the land (with her husband, who is a nurse). They cultivate peanuts, millet, and corn. The land is managed like many other parcels in the area; much is lent out and much is kept in fallow. The registration papers are kept in Kaolack with the older sister.

Title #2547 87.04 hectares

The Cadastre Office lists this land as registered in the name of Eugène Nesbaye. The Domain Office gives a more complete history. On 4 February 1953, the French government registered this land in its own name. On 9 April 1957, the title was transferred to Eugène Nesbaye. On 21 September 1975, Nesbaye sold the land to Philippe Paul André Cadène for 1,500,000 CFA. On 21 May 1975, Cadène changed the status of the land from strictly agricultural to commercial. On 24 July 1978, he mortgaged the land on behalf of Avy Kane Diallo, who used the money to build a pharmacy.

Nesbaye was a German who cultivated cashews and mangoes on the land. According to local residents, when he came to the area he pasted signs all around his property that said, "Keep Out, This Land is Mine." And so everybody did.

Cadène lives in Kaolack. He hired a Bambara to work the land, but this man has been dead for over four years. All the trees that he had planted were destroyed by fire and the land has been in fallow ever since. Because of the title, no one in the village will touch the land, but the general consensus is that "there is enough land in the village anyway."

Title #2703 492.89 hectares

This land was registered by the Marabout Cheike Mbacke on 22 June 1954. On 10 October 1957, the land was mortgaged for 3,000,000 CFA. This mortgage was paid off on 29 February 1960. On 29 May 1967, another mortgage was taken out, this time for 6,400,000 CFA. The record on the second mortgage is incomplete, but Cheike Mbacke's sons are still working the land.

Title #4103 192.98 hectares

This land was registered by Chiekhon Niang in 27 April 1962, by virtue of a procès-verbal coutumier which was delivered by the Chef de Subdivision Central de Kaolack on 10 December 1959. Chiekhon was one of the founders of the village. He registered all of the land in the village in his name and then divided it into three separate parcels. Two of the parcels he gave to his own sons (parcels #4181 and #4182 below), and the third he gave to the sons of the other founders. Of the 132 hectares that his sons own, much is in fallow and much is lent out. Niang's sons expressed the sentiment that there is enough land for everyone in this village, and everyone is glad to lend land to his neighbor. They said that in this village people are honest and return land which they have borrowed. But, because they have a title, the sons of Niang feel that they really have no worries about lending land.

Title #4181 64.33 hectares

On 14 January 1963, this land was split away from title #4103 and re-registered in the name of Chiekhon Niang. On 22 April 1981, the land was mortgaged for 2,000,000 CFA from USBCI. The loan was for a man named Babacar Niang. Babacar Niang apparently paid off the loan, and now the sons of Chiekhon are under the impression that Babacar owns the land but is nice enough to let them use it. They have no idea who Babacar Niang is.

Title #4182 64.33 hectares

This piece of land was also taken from parcel #4103 and re-registered in Chiekhon Niang's name in January 1963. On 7 April 1981, this land was mortgaged for 5,000,000 CFA. On 22 February 1985, the bank repossessed the land. The sons say that the bank did not take the land (or maybe just a part of it) and that the lawyers are working on the problem. The sons are confused as to which parcel is which.

When asked what they thought about land registration, the Niang brothers said that they thought that it was good. Even with all of their troubles with mortgages and lawyers, they are very happy that their father registered the land. Because they have a title, they feel that nobody can bother them and they can lend land freely to anyone who needs help.

Titles #1381, #1382, #138332.88 hectares, 20.40 hectares, 11.00 hectares

Mahawa Diouf was the person who registered this land. Around 1935, the titles were transferred to his heir, Babacar Fodah Diouf. Mahawa was the chef de canton at Kahone. He gathered all of the village leaders to tell them to develop their land so that they could register it. But Mahawa then registered all of the village land in his own name, saying that it was really for everyone. In 1935, Mahawa died and his heir, Babacar Fodah, called all of the leaders together. He told them that Mahawa had mortgaged the village land to a white man named du Pain and that du Pain was getting ready to repossess the land. Babacar Fodah said that in order to save the land, everyone should save money to pay off the mortgage. And so the villagers saved and eventually they had 1,000,000 CFA. They gave all of the money to Fodah. In fact, the land had never been mortgaged. Du Pain had simply paid for the official survey of the land and he wanted his 89,000 CFA back. Fodah paid du Pain the money and then kept the remainder (911,000 CFA) for himself. The villagers eventually found out what happened and were very angry. They now feel that the land belongs to them and that the Diouf family has effectively lost all of its rights to the land. Once Fodah tried to sell the land, but the village would not let him.

When asked why they didn't officially take the land away from the Diouf family, the village chief said that they didn't want to go to court and would rather have this third party title to the land than let the land go back to the State. Every year they meet to trace the borders of the land and set the rules so that everyone bands together to keep the land in the village.

2. Characteristics

Just a quick glance at the cases above is enough for one to realize that these individuals are not typical Senegalese farmers. Of the original title- or leaseholders, two were chef de canton (Thiendella Fall, #1401, and Mahawa Diouf, #1381-#1383), two were Muslim religious leaders, (Ibrahima Niasse, #2277, and Cheike Mbacke, #2703), two were commercial farmers (Mamadou Diallo, #2494, and Eugène Nesbaye #2547), and one was a village chief (Chiekhou Niang, #4103). The chefs de canton, marabouts, and the village chief were all in positions of privilege, both in traditional society and with the colonial government. In most cases, men in these positions had access to information about colonial law and in fact were often used by the colonial government to disseminate such information to the rural population. The two commercial farmers were educated men, and both represented foreign concerns. Not only were all of these men very different from the average Senegalese farmer, but they also seem to confirm some of the misapprehensions about individualized registration of the Senegalese lawmakers at independence. The two marabouts in the sample were able to amass and register huge tracts of land, 603 and 492 hectares, the village chief and one of the chefs de canton manipulated traditional law to register village land in their own names, and at least one of the commercial farmers was engaged in land speculation. Only one of the chefs de canton, Thiendella Fall, registered land that clearly belonged to him under the traditional tenure system. This sample is too small to draw conclusions about the average titleholder, but nevertheless it is clear that the men represented here

are not simple owner-operators wishing to acquire additional tenure security for their family land.

From this small sample, it is also impossible to draw conclusions about the land-use patterns on registered parcels. Nevertheless, it should be noted that contrary to the hypotheses which underlie this work, the registered parcels in the sample do not represent stellar cases of efficient land use, efficient land allocation, or mortgage credit used to enhance agricultural production. It appears that the two commercial farmers, Mamadou Diallo (#2494) and Eugène Nesbaye (#2547), and one of the chefs de canton, Thiendella Fall (#1401), did make major investments in their land with tomato plants and fruit trees, cashews and mangoes, and a tree nursery, but these investments seem to be due more to the individual characters of the men than to the fact of registration. In every one of these cases, the descendants of the original titleholders have allowed the investments to die and no other improvements in the land have been made. Nesbaye's piece of land is completely abandoned now, and even though the land used to acquire credit, the loan did not serve agricultural purposes. As for the other parcels, it is unclear what the Niang brothers (#4182) have done with their loans, and the titles registered by Mahawa Diouf (#1381, #1382, and #1383) do not fit into the scenario of private registration implying increased tenure security. Mahawa himself registered land that was not really his, and his descendant, Fodah, through his own chicanery, is effectively titleless. The villagers themselves have formed a coalition to protect their tenure rights against Fodah.

Nothing can be said about the vast holdings of the marabouts, as they were unavailable for discussion. However, many farmers do complain about the tracts of land that go uncultivated because they are held by marabouts who, even with the aid of their disciples, are unable to work all of their land. It is not clear if the marabouts in this sample are guilty of this, but even if they were, it is not evident that registration is what gives them such control over these hundreds of hectares. Since the passage of the Law of National Domain in 1964, at least two marabouts in the Peanut Basin have acquired the ownership of huge areas of land: one was allocated 1,450 hectares through a special commission, and another was given a national forest (2,679 hectares) by an order of the Khalif Général which was subsequently strengthened through presidential decree. Even without presidential decree, special commission, or private registration, the power of the marabouts to control large tracts of land is undeniable. When the president of the rural council, in whose village section a large gift of land to a marabout was made, was asked about the council's opinion of these transactions, he stated, "These men took the land of everyone but this problem is bigger than we are."

The collection of titles or leases gathered from the Peanut Basin includes a high number of shady case histories, yet in every instance, the current titleholders (or title controllers in the case of Mahawa's village) expressed great satisfaction with their possession of a title. The piece of paper that the title is written on is guarded ceremoniously by the oldest descendant or chief, and everyone in the family or village seems to be aware of the treasure. Even the Niang brothers, with their great difficulties with lawyers and repossession and their confusion as to Babacar Niang's right to their land, are very happy that their father registered the land. (A loan of 5 billion CFA

and the fact that it was village land in the first place probably do much to fuel this sentiment.) But, even the villagers who suffered first Mahawa's and then Fodah's attempts to steal their land are tenaciously holding on to the three titles in Fodah's name, titles that were originally drawn prior to 1935. The villagers feel that these three titles give them protection against the State (the National Domain Law) and against any outsider who might try to usurp their land.

CHAPTER THREE

THE LAW OF NATIONAL DOMAIN

A. The Law of National Domain

At independence, Senegalese land law was comprised of the French Civil Code, the Torrens system, the *livret foncier* system, and uncounted versions of customary law. Drawing on 125 years of colonial land law, Senegalese lawmakers after independence were faced with the need to design a single, unified land-tenure system for the whole country. A commission to study land-tenure reform was formed. The conclusions of this commission, along with observations contributed by the Comité d'Etudes de l'Application de la Loi sur le Domaine National (1967), the Senegalese Supreme Court (1963), and the Ministry of Finance and Economic Affairs (1963), are discussed below.

Four issues were mentioned time and again by Senegalese lawmakers as motivating the direction that land reform took. First, despite their preference for private registration, they were faced with the reality that every attempt by the French to establish a system of private property tenure had failed. The vast majority of the rural population had no use for registered land tenure; the process was costly and time-consuming, offered no more security than the traditional system, and contradicted the communal nature of many customary tenure practices. In addition, lawmakers asserted that the small percentage of the Senegalese population that had taken advantage of the registration system had often manipulated the law to expropriate collective rights for themselves. Lawmakers were concerned that the majority of the rural population would not register their land if given the opportunity by the new national government and that a small class of literate, educated "farmers" that might take advantage of a private registration system could easily make fraudulent claims to land.

Second, lawmakers rejected the possibility of returning to a customary tenure system. Two quotations serve to illuminate their thoughts on the subject. From the Commission de Réforme du Régime Foncier:

It is to be feared that the legitimation of custom would be a step backward, with the capacity to block all modern development. It is a gerontocratic structure in which young people have no chance to bloom, and it accelerates the desertion of the countryside.⁸

8. Original: La cristallisation de la coutume est à craindre comme un élément retrograde capable de bloquer tout développement moderne. C'est une organisation gerontocratique dans laquelle les jeunes ne trouvent plus les chances de leur épanouissement. Elle entraîne la désertion de plus en plus accélérée des campagnes.

And from the Exposé des Motifs:

The customary framework is backward; it offers no possibility for creative investment and blocks all modern development. The landowner has no interest in making improvements necessary to the increase of yields because his income, which is fixed by custom, would not thereby be increased. The tenant, whose status is always dependent, has no interest other than to make the land produce the maximum during the limited time he holds the precarious right to it; he cares little for the maintenance of soil fertility and even less for its improvement.⁹

Clearly, embracing a strictly customary tenure system was not an option in the minds of the Senegalese lawmakers.

Third, lawmakers were extremely wary of the growing power of the Islamic brotherhoods. It was felt that in many areas of the country the traditional tenure system was breaking down and that the system which was taking its place was even worse. Lawmakers described the developing situation as one of neo-feudalism, with religious leaders establishing themselves as grand overlords using groups of dependent laborers, such as migrant workers or disciples, to work their vast landholdings. They felt that the power being amassed by the religious leaders or marabouts was dangerous to the newly formed democratic nation. The Commission on Land Reform warned that:

If this trend continues, the state will be made powerless and completely impotent in its rural activities by the coalition of interests of a possessing bourgeoisie (in the feudal sense of the word) and a religious power structure diverted from its true goals. Elected officials would become nothing more than servants of this bourgeois neo-feudalism, which would have complete power to determine the outcome of elections in what could become a caricature of a democracy.¹⁰

9. Original: L'encadrement coutumier constitue en effet, un élément retrograde n'offrant aucune possibilité d'investissements créateurs et bloquant tout développement moderne. Le propriétaire éminent n'a aucun intérêt à réaliser les améliorations indispensables à l'augmentation du rendement puisque ses revenus fixés par les coutumes n'en seraient pas modifiés. Quant au tenancier dont le statut est toujours dépendant et que des lors, n'a pas d'autre intérêt que celui de faire rendre à la terre le maximum pendant le temps limité dont il en dispose à titre précaire, il se saisit fort peu du maintien de la fertilité des sols et encore moins de leur enrichissement.

10. Original: Si cette évolution devait se prolonger, l'Etat se trouverait impuissant et complètement désarmé dans ses interventions rurales par la coalition d'intérêts d'une bourgeoisie "possédante" (au sens féodal du mot) avec un pouvoir religieux détourné de ses buts réels. Les "élus" ne deviendraient que les serviteurs de cette néo-féodalité bourgeoise qui aurait toute puissance de "faire les élections" dans une démocratie qui ne serait qu'une caricature.

The fourth issue which informed the direction of Senegalese land reform was the fact that lawmakers felt that no detailed land law could hope to conform with the different cultural biases and tenorial customs of the many village communities in Senegal. Diverse ethnic groups had developed tenure systems which corresponded to the geographical and agricultural conditions that existed in the different regions of the country. Any attempt to unify the various land-tenure systems under one formal, regimented tenure law was thought to be politically dangerous and inopportune. The only possibility that lawmakers saw open to them was to devise a general tenure system and leave rural organizations to work out the practical details at the local level.

With these concerns in mind, the newly formed Senegalese government set about to devise a land-tenure system. On 17 June 1964, they laid the cornerstone of Senegalese land law with Law No. 64-46, the Law of National Domain. The fundamental feature of the law was that all land that had not been registered or was not registered in the delay granted by the law became part of the National Domain. Between 98 and 99 percent of all Senegalese land was thus incorporated into the National Domain.

New private registration of land became impossible with Law No. 64-46, but the rights of people who had registered land prior to 1964 remained protected under the law. Special allowances were made for those who wished to register land but had not done so prior to 1964. Anyone who had "added value" to land at the time of the law's enactment could submit a demand for private registration within six months. Anyone with ownership rights granted under French Civil Code had two years to register land. It is interesting to note that 13,000 requests for private registration were submitted just after the enactment of the law and, in fact, land registration still takes place due to the tremendous backlog of requests. But strictly, only the State can register land in its name, and then only for projects that will further the general good of the nation.

The 1964 Law divides the National Domain into four categories: urban zones, classified zones, rural zones, and pioneer zones.* Urban zones consist of all land situated in communities and urban areas. Classified zones are forest areas and protected areas such as national parks. Rural zones consist of those lands which at the time of the law were regularly exploited for agriculture, pasture, or rural housing. All other land is designated pioneer zones. Rural zones, which are of primary interest for an agricultural study, are the administrative responsibility of the rural councils. These councils are composed of elected members chosen from the community.

The 1964 Law stipulates that anyone who personally cultivates land within a rural zone has use rights over that land, but that vacant or poorly used land can be redistributed as the rural council sees fit. The owners of the 2 percent of the land area that had been registered prior to 1964 (or those who were able to do so in the specified delay) are assured the full rights of private property. Those who work their land by merit of traditionally having done so,

* Zones urbaines, zones classées, zones de terroir, and zones pionnières, respectively.

or through grant by the rural council, possess only use rights. Farmers with use rights cannot sell, rent, or lend their land. All transactions must be conducted through the rural council; there is no legal land market. Even matters of inheritance must pass through the rural council. With the death of the original cultivator, heirs must obtain permission from the rural council to continue working the land.

By 1976, lawmakers felt that additional guarantees of tenure security were needed by landholders, especially those wishing to make major investments in the land. On 2 July 1976, Law No. 76-66, "Portant Code du Domaine de l'Etat," was enacted. This law introduced four different methods to increase tenure security or use rights: (1) autorisation d'occuper (note that in urban areas, permis d'habiter and autorisation d'occupation also exist); (2) ordinary lease; (3) long-term lease; and (4) concession de droit de superficie (right of area). Of these four types of tenure guarantees, only the two lease rights can be mortgaged.¹¹

The reform introduced in 1964 by the National Domain Law was sweeping. Traditional tenure rights were completely abrogated and rural councils were vested with ultimate authority in land matters--they could reallocate land according to "merit." In effect, 98 percent of the country's land was reallocated from its traditional owners to the State. Usufruct rights, enforced by the power of the newly comprised rural councils, became most farmers' sole tenure security. The task now is to investigate, through examination of compounds' tenure rights, the extent to which the National Domain Law has been adopted by the agricultural community of the Peanut Basin and to determine what impact this potentially dramatic reform has had on the Basin's farming system.

B. Tenure Rights at the Compound Level

The sample for this part of the study consists of 48 compounds, 22 from the village section of Keur Marie and 26 from the section of Keur Magaye. The social characteristics of the sample sections are given in Table 1.

As shown, the compound composition of the two village sections is very similar. The big differences between the sections appear with regard to literacy and ethnicity, with Keur Magaye possessing the higher literacy rate, and Serer and Wolof ethnic groups dominating in Keur Marie and Keur Magaye, respectively. After speaking to members of both villages, it becomes clear that the

11. It is surprising that in the area of the Peanut Basin study, not one piece of agricultural land could be found that had been officially leased from the State under the provisions of the 1976 Law. This could be due to a number of factors. First, both the Cadastre Office and the National Domain Office in Kaolack was in disarray. It is possible that some lease titles were not included in the list prepared by these government agencies. Second, information about the new leasehold laws was not well publicized. Third, the level of literacy of the population and the difficulties of the procedure make leasehold an option for only a small, well-informed minority of farmers.

TABLE 1
Social Characteristics by Village

	KEUR MARIE	KEUR MAGAYE
No. of compounds	22	26
Average no. of members	11	11
Average no. of men	3 (sd=2.11)	3 (sd=1.48)
Average no. of women	3 (sd=2.40)	3 (sd=1.65)
Average no. of children	4 (sd=3.08)	5 (sd=3.27)
Average no. of elderly	1 (sd= .59)	0 (sd= .66)
Average no. of households	2 (sd= .74)	2 (sd= .78)
No. of literate compound heads	4	22
No. of Muslim compounds	19	26
No. of Christian compounds	2	0
No. of other religions	1	0
Tidiane Brotherhood	10	18
Mouride Brotherhood	3	8
Khadir Brotherhood	6	0
No brotherhood	3	0
Wolof ethnic group	1	25
Serer ethnic group	16	0
Pular ethnic group	1	1
Manding ethnic group	3	0
Other ethnic group	1	0

Note: The brotherhood categories express adherence by their member compounds to the teachings of four prominent Muslim leaders. Members of the different brotherhoods could be influenced by the economic and social principles taught by the original leaders or by the economic strength of the current leaders of the brotherhoods, the marabouts. As the majority of both sample villages belongs to the Tidiane Brotherhood, the pull of opposing economic power structures is not an issue.

difference in the literacy rate is more a reflection of religious fervor in Keur Magaye than of actual ability to read and write (even in Arabic). It appears that anyone who had attended Islamic school stated that they could read and write. As for the ethnic composition of the two villages, it appears that in many ways the adoption of Islam has blurred some ethnic differences. For example, before the advent of Islam, Serer inheritance, unlike that of the Wolof, was matrilineal; now inheritance in both ethnic groups is patrilineal.

The 48 compounds in the sample owned or operated a total of 734.07 hectares of land, corresponding to 351 parcels. The breakdown is 138 parcels and 190.56 hectares for Keur Marie and 213 parcels and 546.20 hectares for Keur Magaye. The land areas held by the two villages are quite different, as would be expected given that Keur Marie is located in a more densely populated area. The 26 compounds in Keur Magaye control almost three times the amount of land held by the 22 compounds in Keur Marie.

Owned land area per compound in Keur Magaye ranged from 0.13 to 59.66 hectares while that in Keur Marie ranged from 0 to 18.10 hectares. The average compound in Keur Marie owned 7.7 hectares while the average compound in Keur Magaye owned 19.34 hectares. The average compound in Keur Magaye owned more than twice the amount of land as the average compound in Keur Marie.

Like in the rest of the Peanut Basin, peanuts, a cash crop, and millet, the staple, are the major crops of the study area. Other crops grown in the village sections include mangoes, sorghum, beans, corn, melon, vegetables, manioc, and byssap (a condiment).

In order to determine the extent to which the Law of National Domain is practiced in the sample area and to characterize correctly the land-tenure system in the area, it is important to detail the tenure rights held by the sample compounds. The inclination to apply labels to a tenure system such as "individual," "communal," "traditional," or even "National Domain," and then compare systems on the basis of legal definitions must be overcome. The complexity of any tenure system can rarely be described in a single word or phrase. There are many rights associated with landownership and these rights must be detailed individually to describe accurately a system of tenure and to provide a basis of comparison with other systems. In the words of R. Simpson (1976, p. 7):

The collection of rights pertaining to any one land parcel may be likened to a bundle of sticks. From time to time the sticks may vary in number (representing the number of rights), in thickness (representing the size or "quantum" of each right), and in length (representing the duration of each right). Sometimes the whole bundle may be held by one person or it may be held by a group of persons such as a company or a family or clan or tribe, but very often separate sticks are held by different persons. Sticks out of the bundle can be acquired in many different ways and held for different periods, but the ownership of the land is not itself one of the sticks; it must be regarded as a vessel or container for the bundle, the owner being the person (individual or corporate) who has the "right of disposal" as it can be called.

In order to determine the tenure situation of the compounds in the Peanut Basin study, compound heads were asked about their compound's bundle of tenure sticks and about each individual stick. Five sticks (rights) were identified for the Basin study: the right of access, the right of selection of heirs, the right of disposition (including sale), the right of mortgage, and the right of leasing or lending. The sample compounds' rights to each of these tenure sticks and the compounds' tenure security over each stick as accorded by either customary law or the Law of National Domain are examined below.

1. Right of Access to a Parcel of Land

In the Peanut Basin study area, the right of access to a parcel of land was clearly defined. This fact is witnessed by the exclusive nature of this right in the area. When asked if someone could take compound land from them, most compound heads in both villages responded firmly in the negative. Table 2 presents the responses. Here the basis of analysis is fields cultivated by the compound head, not the parcel. The sample size is 52 fields for Keur Marie, and 73 fields for Keur Magaye.

That compound heads in Keur Magaye responded in eight cases that fields could be taken from them by the village chief or a relative probably reflected the fact that the village chief was responsible for clearing a fairly high percentage of village land in Keur Magaye and that many tracts of land were obtained from relatives. The one field that can be taken by an administrative authority such as the village council is on land zoned for housing, not agricultural land, and the owner may realize that someday a house might be built on that land.

In the Basin study area, right of access to a parcel of land is established by customary authority and not by the Law of National Domain. The Law of National Domain specifies that use rights to a particular parcel of land

TABLE 2
Who Can Take the Field

	KEUR MARIE	KEUR MAGAYE
No one	52 (100%)	63 (86%)
Village chief	0	5 (7%)
Administration	0	1 (1%)
Relative	0	3 (4%)
No response	0	1 (1%)
Total	52 fields	73 fields

are established through active cultivation of the land and that the State is the ultimate owner with authority to reallocate land according to need. But, contrary to the specifications of the law, every compound head who was interviewed was very clear about the land that his or her compound owned. Not one operated on the premise that the State truly owned the land that his or her forefathers had cleared. Every compound head could lead the enumerators immediately to the compound's scattered holdings and trace out the borders of each parcel, including large tracts of fallow land. There was no question as to which compound in the village owned which piece of land, even land that was not under active cultivation.

In order to gauge the compounds' traditionally based security of tenure, each compound head was asked who had cleared each parcel, that is, who the master of hatchet or borom was, and how each parcel had come into the n'gadio compound's possession. The responses to these questions are enumerated in Tables 3 and 4. The unit of analysis in these tables is the parcel. Since borrowed parcels are not included, the sample size for Keur Marie is 113 parcels, and for Keur Magaye, 188 parcels.

The responses to the question, "Who cleared the parcel?" indicate that a similar amount of land in both villages was cleared by someone in the compound head's lineage group, that is, either by the compound head himself, a relative of the compound head, or a current member of the compound. In Keur Marie, 78 percent of the parcels were cleared by a compound member or relative of the compound head. In Keur Magaye, this number was 77 percent. According to customary tenure practices, compounds have the most secure right over land that

TABLE 3
Who Cleared the Parcel

	KEUR MARIE	KEUR MAGAYE
Compound head	0 (0%)	5 (3%)
Father of compound head	33 (30%)	99 (53%)
Grandfather of compound head	25 (22%)	10 (5%)
Field manager	30 (26%)	20 (11%)
Village chief	3 (3%)	26 (13%)
Relative of compound head	0 (0%)	9 (5%)
Do not know	18 (16%)	0 (0%)
No response	0 (0%)	1 (0.5%)
Other	4 (4%)	18 (10%)
Total	113 parcels	188 parcels

TABLE 4
How the Parcel Was Obtained

	KEUR MARIE	KEUR MAGAYE
Inheritance	75 (66%)	119 (63%)
Relative	7 (6%)	14 (7%)
Village elders	12 (11%)	34 (18%)
Bought or traded	6 (5%)	11 (6%)
Mortgage default	5 (4%)	0 (0%)
Neighbor	6 (5%)	0 (0%)
Taken after loan	0 (0%)	2 (1%)
No response	2 (2%)	8 (4%)
Total	113 parcels	188 parcels

someone in the lineage group cleared. What distinguishes the two villages from one another is the relatively large amount of land cleared by the village chief in Keur Magaye, and the relatively large amount of land in Keur Marie for which the compound head could not identify the clearer (but knew that it was not a relative). The management of land cleared by the village chief in Keur Magaye (13 percent) is in keeping with customary practices and would seem to indicate a link with the village chief and customary law that is not evidenced in Keur Marie. On the other hand, the fact that the clearer of land was unknown for 16 percent of the parcels in Keur Marie seems to mark a rupture with customary law. According to customary law, those compounds have no claim to that land.

With Table 4, it becomes clear that the majority of parcels were inherited (66 percent in Keur Marie and 63 percent in Keur Magaye), which represents a strong traditional claim to the land. The percentages received from the village elders are 11 percent and 18 percent in Keur Marie and Keur Magaye, respectively.¹² This result mirrors the relative importance in Keur Magaye of the village chief in clearing and distributing land. In both villages, a small percentage of parcels was obtained through sale or trade, 5 percent for

12. Using a two-tailed test for difference between proportions (see p. 34 for details), it can be concluded that the two village sections differ at the 10 percent level of significance in the proportion of land that was obtained from the village elders.

Keur Marie and 6 percent for Keur Magaye. In Keur Marie, almost the same percentage was obtained through mortgage (defaults). In neither village did anyone indicate that he had received land from the rural council.

2. Right to Determine Heirs

The answers to the question as to who had the right to determine heirs were difficult to interpret. It was clear that this right is still customary in nature because not one compound head in either village looked to the rural council to determine inheritance or even approve it. But the point where the compound head's right and customary rules of behavior meshed was impossible to determine.

3. Right to Give Land (Right to Sell)

As the right to sell land is strictly forbidden by the Law of National Domain, compound heads were asked about their right to give compound land to someone outside the compound rather than to sell land. The responses to this question are presented in Table 5. Again, the unit of analysis is fields cultivated by the compound head.

In Keur Marie, only one compound head (2 percent) responded that he could not give the field away, while in Keur Magaye, this number was 15 (21 percent). Again, the difference here probably reflects the strength of traditional tenure laws in Keur Magaye. The right to alienate compound land permanently was once considered an impossibility, and if contemplated, the final decision was usually left with the family as a whole or the village elders, not with an individual. The fact that some compound heads felt that they had these rights seems to point to changes in the traditional tenure system.

4. Right to Mortgage

It should be noted that the right to mortgage is perceived as fundamentally different from the right to alienate. Although now strictly illegal on

TABLE 5
Can the Compound Head Give Compound Fields?

	KEUR MARIE	KEUR MAGAYE
Yes	45 (87%)	45 (62%)
No	1 (2%)	15 (21%)
No response	6 (11%)	13 (18%)
Total	52 fields	73 fields

National Domain land, a number of fields in the sample were acquired through mortgage. This and a high incidence of mortgaging in Keur Marie prior to the Law of National Domain point to the fact that mortgaging land was not incompatible with the customary tenure practices. Equipment is also commonly mortgaged, and there are stories of moneylenders left with hundreds of plows as a result of defaults on loans during the period when the government supplied plows virtually free of charge to peanut farmers. As a result of the National Domain Law, the mortgaging of land is no longer openly practiced. This right is not a stick in the bundle of rights available to Peanut Basin farmers.

5. Right to Rent or Lend

Theoretically, this right is also denied by the Law of National Domain. According to the law, all Domain land should be reallocated under the auspices of the rural council; all private land transactions are illegal. On the other hand, customary law allows for the free lending of compound land and, in fact, there was a high incidence of borrowing and lending of land in the sample areas. Table 6 shows the amount and percentage of land that was either lent or borrowed in the samples.

TABLE 6
Land Reallocation by Village

	NUMBER OF PARCELS		HECTARES		PERCENTAGE OF HECTARES IN SAMPLE	
	K. Marie	K. Magaye	K. Marie	K. Magaye	K. Marie	K. Magaye
Borrowed	25	24	25.23	40.61	13	7
Lent	15	39	13.36	90.75	7	17
Borrowed/lent	0	1	0	0.10	-	-

Note: The "borrowed" category specifies land that was borrowed by the interviewed compounds in 1986. The "lent" category denotes land that was lent by the interviewed compounds. Note that there is a possibility for double accounting of land areas in that land lent by one compound in the sample could have been borrowed by another compound in the sample. As neither borrowed nor lent land was traced, it is impossible to distinguish parcels that have been included twice. The "borrowed/lent" category in the table specifies a case where land was borrowed by one compound and then lent out by the same compound. In this instance, a person unknown to the owner of the land wished to borrow the land. He approached a friend of his who knew the owner of the land. This person borrowed the land and then lent it to his friend. This case underlines the importance of personal relationships in land reallocation.

In all the cases of borrowed or lent land, there was no formal contract and no monetary or in-kind payment for use of land. All transactions were based on mutual trust and personal regard, though the weight of customary law served to guarantee fair play. The extent of these transactions illustrates the fact that farmers in the sample are clearly disobeying the provisions of the Law of National Domain. The right to lend land is a stick in the customary bundle of rights alone. The extent to which the National Domain Law has infringed on this right will be examined later.

The impression that emerges here is that the majority of the sticks (rights) are still customary in origin but that these rights are evolving in response to the Law of National Domain and to other modern pressures. The Law of National Domain has successfully curtailed the open sale and mortgage of land but has not put a stop to customary lending practices. Heirs are still determined by compounds in accordance with customary rules without interference by the rural councils. The right of access to land is established primarily through customary principles and, as would be expected from customary law, the right to alienate compound land is not commonly used.

Through examination of the tenure rights in the two village sections, another impression also emerges. This is that the breakdown of customary rights in Keur Marie is further along than that in Keur Magaye. This impression is based on three observations. First, and most important, the link between the rights of the master of hatchet and current access rights is not as strong in Keur Marie as in Keur Magaye. Second, the role of the village elders in allocating land is less important in Keur Marie. Third, more farmers in Keur Marie have begun to include the right to alienate land in their bundle of rights. This shift away from customary tenure law raises the suspicion that land-tenure rights may be less secure in Keur Marie than in Keur Magaye.

This suspicion was confirmed when the sample compounds in the two villages were asked about their perception of the Law of National Domain. Compounds in Keur Marie tended to have strong negative opinions of the Domain Law while those in Keur Magaye professed only grapevine knowledge of the law, and their opinions, based on this secondhand knowledge, tended to be much more vague. The compounds in Keur Marie have had greater experience with the Law of National Domain. But whether the penetration of the Domain Law in Keur Marie is due to the vacuum created by a deteriorating customary tenure system or whether the customary system is deteriorating in response to a more vigorous application of the Domain Law in Keur Marie is difficult to ascertain. Whatever the sequence of events, though, the fact remains that the compounds in Keur Marie are more aware of the Law of National Domain, and this awareness, combined with a weakening customary tenure system, has served to introduce an element of insecurity into the tenure situation in that village.

In response to the question about their opinion of the Law of National Domain, very few compound heads in Keur Marie had anything positive to say. Of those who did have positive comments, one said that the law gave borrowers more security in that owners could no longer take back land at a moment's notice. Another felt that the law was a good innovation in that "newcomers don't have to pay homage anymore." The vast majority of the compound heads in the Keur Marie sample had negative opinions of the Law of National Domain. In all cases, the complaint against the law centered on lending land. Those

farmers with enough land complained about the risk of losing land that they lent out or were unable to cultivate. One farmer stated this sentiment quite succinctly when he said, "All we had to our names was the land, and now they have even taken that away from us." Another farmer stated that the National Domain Law allowed people to steal the land of others. Those farmers without enough land complained about their inability to borrow it. When asked why they didn't ask the rural council for more land, one of the land-short compound heads stated that he wouldn't dream of approaching the rural council for fear of ostracism from the village.

The overwhelming impression that emerged through discussion with farmers in Keur Marie was their discomfiture with the shifting tenure rules. Although the tenure system in the area is still grounded in customary practice, a break with tradition has occurred and the Law of National Domain is beginning to assert itself. The farmers in the area are uneasy about the prospect of an increasingly intrusive law and, as a result, are becoming more insecure about their land-tenure position.

This sentiment is not evidenced in the opinions expressed by the farmers in Keur Magaye. In Keur Magaye, very few compounds had concrete impressions of the Law of National Domain. Ten compound heads explicitly stated that the law was not obeyed in the region, and the general vagueness or secondhand quality of most of the other responses indicate that this is indeed true.¹³ An equal number of compounds had positive, negative, and no opinions of the Law of National Domain. Among those with positive opinions, responses included that the law alleviated some land disputes, gave everyone land according to their needs, and "helped to erase empty spirits." More concretely, one individual stated that before the law, people who borrowed or rented land would not make improvements on the land and that now they would--except that now it was more difficult to borrow land. The compounds in Keur Magaye with negative impressions of the law generally felt that people would not lend land anymore for fear of losing it. One compound head answered that the law could "cause big problems," but would not elaborate. Another said, "The law puts everyone at the same level, but then, on the other hand, it is impossible for strangers to use it." Although some farmers in Keur Magaye were able to give vague impressions of the law, the general attitude was that in their community, the law was not obeyed and, therefore, problems or benefits associated with it did not exist.

The incidence and type of land disputes in the two village sections also serve to confirm the evidence that the Law of National Domain has proved more obtrusive in the section of Keur Marie than in the section of Keur Magaye. Among the twenty-two sample compounds in Keur Marie, there have been six cases of land dispute since the passage of the National Domain Law. All but one of these disputes involved cases where one compound had lent land to another and the borrower approached the rural council to take "possession" of the land.

13. In both villages, though not always aware of the Law of National Domain, most farmers were knowledgeable about the rural councils. This is due to the fact that in addition to administering rural zones, the rural councils were responsible for managing development funds in their village sections.

The remaining dispute was a case where someone approached the rural council to take possession of a piece of fallow land belonging to someone else. Among the twenty-six compounds in the Keur Magaye sample, there had been three land disputes since the passage of the Law of National Domain, not one of which was over borrowed land. It appears that the breakdown of customary tenure arrangements in Keur Marie has allowed for the possibility of disputing land-ownership claims and that the Law of National Domain has provided the means.

In conclusion, through examination of the bundle of tenure rights in the two sample village sections and analysis of the compounds' opinions about the Law of National Domain, it becomes clear that the compounds in Keur Marie are more insecure in their land-tenure rights than those in Keur Magaye. The factors of greater population pressure, changes in the traditional tenure system, and greater awareness of the Law of National Domain seem to have contributed to weakening the tenure security of the compounds in Keur Marie.

Given the fact that tenure rights are less secure in the village section of Keur Marie than in Keur Magaye, a number of hypotheses concerning the role of tenure security in agricultural performance can be tested. These hypotheses center around two issues: land stewardship, and allocative efficiency. Each of these issues is examined below.

C. Land Stewardship

Here the hypothesis is that compounds that securely own their parcels will be more willing to make capital improvements on the land. Those compounds that are insecure in their tenure rights will not have incentive to make long-run capital improvements in the land such as bunding, fencing, terracing, liming, digging wells, constructing buildings, and planting trees. Furthermore, in cases where usufruct rights are very tenuous, even short-run improvements such as fallowing, crop rotation, and the application of fertilizer or manure will be rare. With the Law of National Domain, there are no assurances that the increased value of the land will return to the farmer who made the improvements or to his/her descendants. The law does specify that in the case of reallocation, the displaced farmer shall receive compensation for improvements, but, especially in the case of soil maintenance, many improvements are difficult to monetize. The hypothesis is that insecurely held land will have fewer capital improvements and have poorer fallow and rotation records than more securely held parcels. Translated to the Peanut Basin sample, the hypothesis is that the compounds of Keur Marie will, on average, exhibit lower rates of investment in the land than those of Keur Magaye.

The primary difficulty that arises in testing this hypothesis is that the level of land-improving or land-maintaining investment among the Peanut Basin farmers is extremely low. Many improvements in the land are not being made, and according to studies conducted by the International Crops Research Institute for the Semi-Arid Tropics, the efficacy of many of these practices in the Sahel is questionable.

During the second round of interviewing, the enumerator visited each parcel that was owned or cultivated by the compound. At this time, the compound head was explicitly asked if any improvements had been made on the parcel. The results of this line of questioning are presented in Table 7.

TABLE 7
Land Improvements

	KEUR MARIE	KEUR MAGAYE
No improvements	75 (54%)	133 (62%)
Trees	66 (48%)	70 (33%)
Fences	8 (6%)	14 (6%)
Pasturage	2 (1%)	1 (0.5%)
Manure	0 (0%)	1 (0.5%)
Wells	8 (6%)	0 (0%)
No response	0 (0%)	3 (1%)
Total	138 parcels	213 parcels

Note: Borrowed parcels included.

The most common type of improvement found in both villages is trees. The level of real investment in land maintenance this represents is probably inflated as scrubby bushes were often defined as trees. In addition, all trees, not just planted trees, were included in the calculations. This was done because not removing trees is often as important a management decision as planting trees. The fences in both villages were found primarily around the small fields of vegetables, melon, and manioc. The wells in Keur Marie were to provide water for the vegetable and melon fields. No wells were found in Keur Magaye because the water table is too low.

The information presented in Table 7 corresponds to 80 fields with one or more improvements in Keur Magaye and 63 fields with one or more improvements in Keur Marie. This translates to 38 percent of Keur Magaye's 213 parcels and 46 percent of Keur Marie's 138 parcels. It certainly cannot be argued that the relatively insecure tenure situation of the farmers in Keur Marie has led to a decrease in land improvements. In fact, the opposite appears to be true, for farmers with less secure tenure have made more improvements in their land than those with more secure tenure. The higher number of improvements is significant. Using a two-tailed test for difference between proportions, it can be concluded that the two village sections differ in the proportion of improvements made in the land at the 15 percent level of significance. The null hypothesis that the proportion of improvements in Keur Marie (p_1) is equal to the proportion of improvements in Keur Magaye (p_2) is rejected if:

$$p_1 - p_2 < -.078 \quad \text{or} \quad p_1 - p_2 > .078$$

As $p_1 - p_2$ is equal to 0.08, the null hypothesis must be rejected at the 15 percent level of significance.¹⁴ This means that the hypothesis that farmers with less secure tenure make more improvements in the land cannot be rejected. Explanation for this result may be due to the fact that farmers with insecure tenure rights might be more motivated than those with secure rights to prove visibly their stewardship of the land. With the passage of the National Domain Law, landownership was validated through the ability to show that improvements had been made to the land (that is, that the land had been *mise en valeur*). It can be argued that in making improvements, the farmers in Keur Marie are seeking to establish more firmly their tenure rights. But because trees and scrubby bushes constitute the majority of improvements, and because it is difficult to judge whether they are a managed improvement, this result is not certain. The use of two other soil-saving management practices, fallowing and crop rotation, will be examined next.

Three hypotheses can be made about fallow in light of the 1964 Domain Law and its influence on tenure security. The first is that insecure tenure rights will lead to a diminished level of land-improving investments such as fallowing. In this case, fallowing is a productive investment in land maintenance. The second hypothesis is that there will be a tendency for the amount of fallow to increase because of the illegality of informal lending. Farmers who perceive that the lending of land increases the likelihood that land will be redistributed to land borrowers, on the premise that lent-out land must not be needed by the compound, may prefer to keep land idle (and under compound control) rather than lend it to another compound and allow that compound to establish its usufruct rights to the land. In this case, land is not kept in fallow for soil-maintenance purposes but because the compound does not want or is unable to cultivate the land itself and does not want to lend it out. Alternatively, with an extremely vigilant rural council or an extremely insecure compound, the reasoning behind the second hypothesis could lead to opposite results. An active rural council will reallocate land that is left unproductive and, in an effort to secure rights over their holdings, insecure compounds will have the incentive to adopt extensive planting strategies based on extremely low planting densities. This third hypothesis, therefore, is that because active cultivation of land is the only basis of legal ownership, the amount of fallow will decline.

The first step in deciphering which of these hypotheses, or which combination of hypotheses, holds true is to look at the incidence of fallow in the sample villages. What emerges from the study is that in almost every case,

14. Hypothesis test: Let p_1 = proportion of land with improvements in Keur Marie, p_2 = proportion of land with improvements in Keur Magaye, q_1 = proportion of land without improvements in Keur Marie, and q_2 = proportion of land without improvements in Keur Magaye. Then, using a binomial distribution, the standard error is approximated by: $s = \text{square root } [pq(1/n_1 + 1/n_2)] = s = \text{square root } [(.41)(.6)(1/138 + 1/213)] = 0.054$, where p and q equal weighted mean of the observed sample percentages. At the 15 percent level of significance, the values of z for a two-tailed test are calculated at 1.44 and -1.44. Therefore, $z_s = z_s = (+/-1.444) = +/-0.078$.

compounds had more land in fallow than they would have preferred and, aside from deciding which parcels to leave fallow, very little strategy went into determining the total amount; compounds simply left land in fallow due to one or more resource constraints. Out of the 108 parcels which were left fallow in the 2 village sections, 76 were fallow due to lack of seeds or labor, and 6, because they were too far from the compound or were of exceptionally low quality (exhibiting insect holes or perpetually threatened by animals). (For 2, no response was given.) Only 24 of the 108 parcels were left fallow "in order to give the land a rest." The responses by village are presented in Table 8.

TABLE 8
Reason the Parcel Was Left Fallow

	KEUR MARIE	KEUR MAGAYE
Lack of peanut seed	22 (67%)	49 (66%)
Lack of seeds other than peanut	0 (0%)	2 (3%)
Lack of labor	1 (3%)	2 (3%)
Give land a rest	8 (24%)	16 (22%)
Too far from compound	0 (0%)	1 (1%)
Poor quality land (insect holes, etc.)	1 (3%)	2 (3%)
No response	2 (6%)	2 (3%)
Total	33 parcels	74 parcels

The percentage of land left in fallow for productive reasons is almost exactly the same for the two villages, 24 percent for Keur Marie and 22 percent for Keur Magaye. It would be impossible to claim that the added element of insecurity in the Keur Marie tenure system has led to a lower level of productive fallow as proposed in hypothesis one or, as forwarded in hypothesis two, that there is a lower level of fallow due to more extensive cultivation. It would also be impossible to claim that there is a higher incidence of fallow because people in Keur Marie prefer to keep land in fallow rather than lending it out, as stated in hypothesis three. Again using a two-tailed test for difference between proportions, it can be concluded at the 1 percent level of significance that the two village sections do not differ in the proportion of land left fallow for productive reasons. The null hypothesis, that the proportion

of fields left fallow for productive reasons in Keur Marie (p1) is equal to the proportion in Keur Magaye (p2), is rejected if:

$$p1-p2 < -.225 \quad \text{or} \quad p1-p2 > .225.^{15}$$

Because p1-p2 equals 0.01, the hypothesis cannot be rejected. It is only at the 91 percent level of significance that the hypothesis can be rejected, which means that the proportions are statistically identical. Insecure tenure does not lead to a greater or lesser amount of productive fallow.

What becomes very obvious through the responses to the fallow question is that overriding any other constraint to efficient land management, such as tenure insecurity or labor or other input shortages, is the inability of farmers in the Basin to acquire enough peanut seed. Because the quality of peanut-seed stock cannot be maintained with a farmer's own reserves, farmers are dependent on the government or traders for their supply of peanut seed. Prior to and including the 1985/86 season, the amount of government-supplied peanut seed was being curtailed, and private traders had not yet taken up the slack. As seen from the responses above, the ability of a farmer to acquire this scarce input was the primary factor in determining how much land was left fallow.

The next soil-saving practice to examine is field rotation. For the most part, an every-other-year rotation schedule between peanuts and millet is closely maintained throughout the Peanut Basin. Farmers recognize the benefits to soil quality and hence to productivity. As most compounds within the sample have enough parcels to rotate them between millet and peanuts or fallow, the decision not to do so is surprising. Table 9 shows the number of fields that were left in peanuts or millet for three years in a row, and Table 10 shows those fields that were planted in peanuts or millet for two years. Data were collected for the three-year period from 1984 through 1986. The sample size is 103 fields for Keur Marie and 151 fields for Keur Magaye.

It does appear that on average farmers in Keur Marie are not as meticulous about following rotation schedules as those in Keur Magaye. In particular, they are more likely to designate a field as the compound's millet field and cultivate millet there for several years in a row. It could be that this practice can be explained by short-sightedness induced by insecurity of tenure, or it could be a practice traditional among the Serer. But in any case, the numbers are not large enough to support a persuasive argument. Again using a two-tailed test for difference between proportions, the null hypothesis must be rejected at the 1 percent level of significance if:

$$p1-p2 < -.116 \quad \text{or} \quad p1-p2 > .116^{16}$$

15. Hypothesis test (see p. 34): $s = \text{square root } [(.223)(.777)(1/33+1/74)] = .087$; $zs = (+/-2.58)(.087) = +/- .2247$.

16. Hypothesis test: $s = \text{square root } [(.15)(.85)(1/103+1/151)] = .045$; $zs = (+/-2.58)(.045) = +/- .116$.

TABLE 9
No Rotation for Three Years

	KEUR MARIE	% OF FIELDS	KEUR MAGAYE	% OF FIELDS
Peanuts	1	1	0	0
Millet	2	2	11	7

TABLE 10
No Rotation for Two Years

	KEUR MARIE	% OF FIELDS	KEUR MAGAYE	% OF FIELDS
Peanuts	2	2	2	1
Millet	12	12	8	5

where p_1 is the proportion of land that had not been rotated for two or more years in Keur Marie (16 percent) and p_2 the same proportion for Keur Magaye (14 percent). Since $p_1 - p_2 = 0.02$, the null hypothesis cannot be rejected and it can be concluded that the two village sections do not differ at the 1 percent level of significance in the proportion of land that was not rotated. It is only at the 66 percent level of significance that the null hypothesis is rejected, but such a high level of significance reflects the fact that the two proportions are statistically identical.

Examination of the improvements made on the land, the use of fallow and of rotation schedules, fails to lend support to the hypothesis that the land management practices of the less secure farmers of Keur Marie are not as good as those of the more secure farmers of Keur Magaye.

D. Land Allocation

The hypothesis with regard to land allocation is that compounds that are less secure in their traditional rights because of the National Domain Law will be unwilling to engage in informal land reallocation. Because formal and informal lending of land is strictly forbidden with the Law of National Domain, a farmer who lends land risks losing it; the borrower could claim rights over the land and, as the current cultivator, would have a strong case before the rural council. Unlike with traditionally secured land, land could be allocated very inefficiently among the compounds with more tenuous land rights. Following this reasoning, the incidence of lending and borrowing in Keur Marie should be lower and the ratio of hectares per compound member more unequal across compounds than in Keur Magaye.

Focusing first on the incidence of borrowing and lending in the two villages, it is surprising to note that despite the complaints of the villagers of Keur Marie about the risk of lending land, quite a few compounds in the village do so. Table 11 shows the breakdown by village.

TABLE 11
Number of Compounds That Had Borrowed or Lent Parcels

	BORROWED	LENT	BORROWED AND LENT
Keur Marie	9	6	3
Keur Magaye	4	13	7

It would seem that in both villages land is still reallocated on an informal basis, with neighbors lending to one another for rotation purposes, or because of distance considerations, and very rarely because the borrower does not have enough land. Tables 1 and 2 in Appendix 2, which shows the amount of hectares each compound owned, borrowed, lent, and left fallow during the 1986 season, illustrate the fact that in Keur Marie and Keur Magaye only four out of the twenty-three borrowers did not have some of their own land in fallow at the same time they were borrowing land. In Keur Marie, where land is more scarce, three of the twelve borrowers did not have fallow land while in Keur Magaye, only one of the eleven borrowers did not have fallow. Clearly, both villages are still reallocating land despite the threat of the National Domain Law.

Focusing now on hectare-per-compound-member ratios, and given the fact that most compounds are using the same technology, efficient land allocation

would indicate fairly equal distribution of cultivated land across compound members. This being the case, if allocative efficiency were indeed hindered by insecure tenure rights, it would be reasonable to expect the cultivated-land-per-compound-member ratios in Keur Marie to be more unequal than those in Keur Magaye. Table 12 gives three different calculations of the ratio of land per compound member for the two village sections. Column A is the ratio of owned land per member; column B, the ratio of cultivated land per compound member; and column C, the ratio of cultivated and fallow land per compound member.

In both villages reallocation due to borrowing and lending serves to reduce the variation in land per compound member as does the exclusion of fallow from the calculations. But without making assumptions about inequality weights, it is impossible to determine which village has been more successful at redistributing land among the village population. The most that can be said is that each village has done so and that the resulting reallocation appears to be more efficient.

TABLE 12
Ratios of Land per Compound Member
(hectares per member)

	A ^a	B ^b	C ^c
Keur Marie:			
Mean	.89	.69	.85
Standard deviation	1.12	.62	.74
Range	5.60	3.18	3.66
Minimum	0	.11	.31
Maximum	5.60	3.29	3.97
Coefficient of variation ($\frac{sd}{mean}$)	1.26	.90	.87
Keur Magaye:			
Mean	1.87	.88	1.63
Standard deviation	1.41	.65	1.09
Range	6.13	2.62	4.36
Minimum	.01	.18	.27
Maximum	6.14	2.80	4.63
Coefficient of variation ($\frac{sd}{mean}$)	.75	.74	.67

a. A = owned land per member.

b. B = owned land + borrowed land - fallow - lent per member.

c. C = owned land + borrowed - lent per member.

Again, as in the case of land stewardship, land-allocation patterns in the two villages do not support the hypothesized link between secure compound tenure and efficient land management. Indeed, in the comparison between the relatively insecure farmers of Keur Marie and the relatively secure farmers of Keur Magaye, increased tenure security has not overtly manifested itself in more efficient land-use patterns. Now the question is, Why not? Are there other social, economic, or political factors that override the role of tenure security in farm management in the Peanut Basin? Or can it be concluded from the evidence presented here that tenure security is never an important factor in farm management?

In the case of the Peanut Basin farmers, it is logical to suspect that other factors such as environmental risk, incomplete markets, and a poorly functioning infrastructure all contribute to suppressing the importance of tenure security in determining land-management practices. The hypothesis that land tenure plays a role in encouraging efficient land-use patterns cannot be rejected, but the importance of this role does seem to be diminished by the myriad of other constraints faced by Basin farmers. In the next chapter, the socioeconomic structures of the two village sections are examined and the role of environmental and institutional constraints (such as the tenure system) in shaping the two socioeconomic systems is explored.

CHAPTER FOUR

THE VILLAGE SECTION SOCIAL ACCOUNTING MATRIX

In order to examine the socioeconomic structures of the two village sections, social accounting matrices of the two sections were constructed. A social accounting matrix (SAM) is a concise framework in which to present the economic activity of a village, region, or country. In a single table, a SAM provides a snapshot view of both the circular flow of accounts and the input-output matrix of a given economy. Within the village, region, or country, a SAM records the transaction between institutions, the amount and source of factors used in production, the flow of value added, and the economic interaction between the modeled economy and the rest of the world. The SAM also registers the savings and investment pattern of the institutions in the economy.

The basic accounting principle of the SAM is that for every account, sources must equal uses. That is, all income must be spent or otherwise paid out, that is, put into savings or investment or transferred to another account. This means that the row and column totals for every account must be equal. The five basic characteristics of a SAM are listed below.

- 1) A SAM is a square matrix containing the same number of rows and columns.
- 2) Each row and the corresponding column is called an account.
- 3) Accounts represent entities such as factors of production, institutions (households, firms, government, and the rest of the world), or activities (production).
- 4) A column represents expenditures of an account and a row represents receipts of an account.
- 5) Column sums and the corresponding row sums are always equal.

Using the Peanut Basin data, two SAMs were constructed: one for the village section of Keur Marie, the other for the village section of Keur Magaye. (See Appendix Three.) The SAMs are constructed so as to supply information for two comparisons. First, because SAMs were constructed for each of the two village sections, the different constraints such as land-tenure insecurity faced by Keur Marie and Keur Magaye have served to mold and distinguish the socioeconomic structure of the two villages. Second, the SAMs are constructed so as to distinguish land managed by different compound members. In this way, comparisons between compound members with secure tenure rights and members with insecure tenure rights can be made. The SAMs also allow for comparisons at the macro and micro levels.

Before continuing with the description of the SAMs, a brief digression is necessary to explain the tenure-security classification of field managers. In

the Peanut Basin sample, 136 different field managers were identified. These 136 managers supervised 262 fields. In order to gauge the tenurial rights of the field managers, a series of questions was asked of the manager of each field:

1. How did you obtain this field? / Who gave you this field to work?
 - a. Through sale or mortgage
 - b. Inherited
 - c. The household head
 - d. The compound head
 - e. The village chief
 - f. The rural council
 - g. Borrowed
 - h. The previous compound head
 - i. A relative
 - j. Other
2. How many years have you been the manager of this field?
3. Who could take this field away from you?
 - a. Nobody
 - b. The household head
 - c. The compound head
 - d. The family
 - e. The village chief
 - f. The rural council
 - g. A relative who does not live in the compound
 - h. The lender
4. Will you manage this field next year?
 - a. Yes
 - b. No
 - c. Do not know
5. Will your children operate this field?
 - a. Yes
 - b. No
 - c. Do not know
6. Who determines who the heirs to this field will be?
 - a. I do (that is, the current field manager)
 - b. The head of the household
 - c. The head of the compound
 - d. The village chief or council
 - e. The rural council
 - f. A family member who lives outside the compound
 - g. The lender
 - h. Do not know
7. Can you give this field away?
 - a. Yes
 - b. No
 - c. Do not know
8. Who determines the crop planted on this field?

9. Who determines the quantity of seeds planted?

10. Who determines the amount of pesticide used?

Based on the managers' responses to these questions, the 262 fields owned by the various compounds are classified according to the bundle of tenurial rights possessed by their field managers. The fields are grouped into three classes: those managed by managers possessing secure tenure rights, those managed by managers possessing moderately secure rights, and those managed by managers with insecure tenure rights.

Managers with the most secure rights over a field are those who stated that no one could take the field from them, that they would work the field next year, and that their children would manage the field. These managers determined what crops they planted, the amount of seeds planted, and the amount of pesticide used. There were 126 fields in the sample in this category. Of these 126 fields, 31 were managed by individuals who had the added rights of determining who would inherit the field and stated that they had the unconditional power to give the field away, though most expressed the sentiment that they never would. All of the secure managers stated that their children would take over the field in question.

The fields in the moderately secure classification are cultivated by managers who stated that no one could take the field from them but, at the same time, they either did not determine crop, seed, or pesticide or did not know if they would be working the field next year or if their children would operate the field. Only 30 fields fall into this category.

In the insecure classification are the 75 fields managed by individuals who felt that someone had the right to take the land away from them. Of these field managers, 60 said that the compound head could take the field from them; 8 said the village chief; 1, the rural council; 1, another relative; and 3 said someone else. (Also included in this classification are 2 fields whose managers did not know if someone could take the land from them.)

A category for borrowed fields was added to the three above. The inclusion of the borrowed fields brings the total number of fields to 272: 126 with secure tenure, 30 with managers possessing moderately secure rights, 75 with managers possessing insecure tenure rights, and 41 borrowed fields. The field portfolios of the managers could be diverse, with some managers managing one field and others managing several. A single manager could be responsible for, say, three fields: one with secure tenure rights, another with insecure rights, and another that was borrowed. One must also keep in mind that the tenurial security of every field manager is conditioned by the tenure rights and security of the compound as a whole.

The organization of the compound's internal land-distribution system surfaces in the analysis of manager security. The most secure managers tend to be brothers of the compound head. These men are often independent household heads who cultivate their own millet fields and manage their own landholdings. No one has the right to take their land. The most insecure managers tend to be the women in the compound. They are usually allocated a different field each year for peanut cultivation. Whereas the bundle of rights accorded to

TABLE 13
Relationship of Manager to Compound Head and Degree of Security

RELATIONSHIP TO COMPOUND HEAD	TOTAL NUMBER OF PEOPLE	TOTAL NUMBER OF FIELDS			
		Secure	Mod. Secure	Insecure	Borrowed
Wife	31	3	7	14	5
Son	24	4	12	10	2
Brother	13	11	3	2	5
Sister-in-law or daughter-in-law	10	0	1	3	2
Mother	4	0	1	3	0
Nephew	2	1	1	4	0
Aunt	1	0	0	1	0
Father	1	0	0	0	1
Cousin	1	0	0	0	1
Sister	1	0	0	0	1
Brother-in-law	1	0	1	0	0
Unknown	1			2	

brothers and married sons often includes sticks denoting ownership (including the right to determine heirs), the rights accorded women and younger sons tend to denote the right to income from compound land rather than ownership rights to a particular parcel. These distinctions are further investigated with the SAMs.

Although the SAMs themselves are reproduced in Appendix Three, it is worth describing the kinds of data they contain.. The accounts in the SAM for Keur Marie and that for Keur Magaye are identical.

A. The Accounts

1. Endogenous Accounts

a. Activities

- Peanuts/peanut farming. Approximately 36 percent of all cultivated land in the two villages was planted in peanuts.

- Millet/millet farming. Approximately 53 percent of all cultivated land in the two villages was planted in millet.
- Other crops. This category includes mango, sorghum, beans, corn, melon, vegetables, manioc, and byssap. These crops accounted for approximately 11 percent of all cultivated land in the two villages.
- Animal services. This account registers the use of animal traction (cattle, horse, donkey) in the villages. The value of the use of animal-traction services on a field was calculated at 2,500 CFA for the use of a horse or a bullock, and 2,000 CFA for the use of a donkey.
- Services. Service industries in the village are well-digging, construction, teaching, and tea-making.
- Commerce. The commerce engaged in by members of the villages consists exclusively of petty trade. The merchants bought oranges, fish, condiments, and miscellaneous commodities at relatively large markets and then sold their wares at smaller markets or in front of their compounds.

b. Factors

Labor types:

- Manager labor--the amount of time, valued at the agricultural wage rate, that the field managers spent working on their own fields. The agricultural wage rate was calculated at 500 CFA per day for planting, the first weeding, and harvest; and at 250 CFA per day for field preparation and the second weeding. These were the going prices for each of these tasks in the villages. By convention, the labor of children (younger than 15 years old) was valued at half that of adults. (At the exchange rates that were in effect at the time of the study, 500 CFA = \$1.50 per day and 250 CFA = \$0.75 per day.)
- Household labor--the amount of time, valued at the agricultural wage rate, that members of the field manager's immediate household spent working on the manager's fields.
- Compound labor--the amount of time, valued at the agricultural wage rate, that members of the field manager's compound (not including his/her immediate household) spent working on the manager's fields.
- Village labor--the amount of time, valued at the agricultural wage rate, that members of the village spent working on the manager's fields.
- Imported labor--the amount of time, valued at the agricultural wage rate, that workers from outside the village spent working on the manager's fields.

- Nonagricultural labor--value of labor time spent on nonagricultural activities. Time spent watching animals was calculated at 250 CFA per day to correspond to the agricultural opportunity cost of labor. The lower wage rate was used since herders are often marginal laborers.

Land types:

- Secure fields--the value of the land services of those fields supervised by managers possessing secure tenure rights. The value of land services was calculated by subtracting the value of labor time, seeds, pesticide, and fertilizer from the value of the crop in question.
- Moderately secure fields--the value of the land services of those fields supervised by managers possessing moderately secure tenure rights.
- Insecure fields--the value of the land services of those fields supervised by managers possessing insecure tenure rights.
- Borrowed fields--the value of the land services of borrowed fields.
- Grazing rights--the value of animal grazing-land services. Like other land services, this is a residual calculation. It was calculated by subtracting the value of labor time spent watching the traction animals from the total value of animal services.

c. Institutions

- Large compounds. The compound is the repository of land value added and managerial, household, compound, and nonagricultural labor value added. It is the basic unit of consumption and the recipient of remittances and salaries from outside the village. The compounds in the sample have been divided into three categories: those with large-sized landholdings, those with medium-sized landholdings, and those with small-sized landholdings. Because of the large variation in average holding size in the two villages, these categories correspond to very different hectarage breakdowns. In Keur Marie, the six big landholders have areas ranging from 10 to 20 hectares while in Keur Magaye, the eight big landholders have areas of 20 to 60 hectares.
- Medium compounds. In Keur Marie, the nine medium-sized landholders control areas ranging from 5 to 10 hectares, and in Keur Magaye, the nine medium landholders have 10 to 20 hectares.
- Small compounds. In Keur Marie, the seven small compounds have holdings ranging from 0 to 5 hectares while the nine small compounds in Keur Magaye have 0 to 10 hectares.

d. Savings

- Capital/savings/investment. This account enumerates the compound's "purchases" of investment goods and services such as animals, seed stock, equipment, or building materials.

2. Exogenous Accounts

- Cooperatives. This account includes all government-sponsored peanut-marketing services. These services supply peanut seed and pesticide (often on credit) at the beginning of the season and then purchase most of the peanut production from farmers at the end of the season. In Keur Magaye, these cooperatives also purchased some millet.
- Weekly market. Both Keur Magaye and Keur Marie are within walking distance of a major weekly market (the markets of Birklane and Gandiaye, respectively). These markets are the primary sources of purchased consumption goods. Neither Keur Magaye nor Keur Marie has a village market or village store.
- Other Senegal. This refers to the world farther away than the weekly market. It includes the daily market at Kaolack, which is about an hour's drive from each of the villages. Also included in this account are all other points in Senegal, including the capital, Dakar. Salaries and remittances earned outside the village originate in this account.

B. Outline and Specifics: Structure of the Village Economies

The village SAMs for Keur Marie and Keur Magaye are presented in Tables 1 and 2 in Appendix Three. All entries in the SAMs represent CFA valuations. [At the time of the study, 1,000 CFA was approximately \$3 (U.S. dollars).] The blocks, comprising activities, factors, institutions, savings, and exogenous accounts in the two SAMs, are illustrated in Diagram 1 of Appendix Four. A description of each block is also included in Appendix Four.

1. Comparison of the Socioeconomic Structure of the Two Village Sections

In comparing the structure of the two socioeconomic systems, the most striking thing about the two village SAMs is that they describe two economies that are fundamentally identical. They are single cash-crop and single staple-crop economies that revolve around peanuts and millet. There is very little economic interaction between compounds within each village section. The flow patterns described by these SAMs are uncomplicated. The majority of purchased inputs and consumption items are imported; the majority of the cash crops are exported. Compounds consume most of their own millet production. Neither village has a village store or market.

And yet, a difference between the two villages does emerge with further examination of their socioeconomic structures. Remittance, salary, and extra-agricultural income play a much more important role in Keur Marie than in Keur

Magaye. The twenty-two compounds in Keur Marie earn 2,669,520 CFA (31 percent of total income) from remittances or salaries from outside the village section while the twenty-six compounds in Keur Magaye earn only 539,300 CFA (3 percent of total income) from outside the section. These numbers are not quite as significant as they appear because a large portion, 1,800,000 CFA, of the amount earned by Keur Marie households is, in fact, earned by one compound that has a member working as a bookkeeper in Kaolack. But, even if his salary is excluded from the total, remittance and salary income in Keur Marie is still 869,520 CFA or 10 percent of total income as compared to only 3 percent in Keur Magaye. As for village-based extra-agricultural activities, in Keur Marie 818,000 CFA of compound income (or 10 percent) is gained through service or commercial activities while in Keur Magaye this amount is 817,725 CFA (5 percent of total income). The difference in percentage of income is 200 percent.

As the inhabitants of both village sections have access to Dakar, Kaolack, and other employment centers, and because both sections possess large areas of fallow land, it appears that the explanation for the difference in external and nonagricultural income is not due to differences in opportunity. Instead, the explanation is found in portfolio theory. Two facts explain the relative importance of salary, remittance, and extra-agricultural income in Keur Marie as compared to Keur Magaye. First, as was argued earlier, the farmers in Keur Marie are less secure in their landholdings than those in Keur Magaye. Second, because of the structure of the government cooperative in Keur Marie, farmers in that village section are less secure in their continued access to government-supplied peanut seed. As a result of these two sources of insecurity, farmers in Keur Marie have had greater incentive to diversify away from agriculture into income-earning activities that will help ensure against a potential scarcity of peanut seed and the possibility of their land being "repossessed" by the state or by a neighbor.

Information presented in the SAMs supports this hypothesis. It appears that in 1986, farmers in Keur Marie planted peanuts until constrained by the unavailability of peanut seed. This is evidenced by the large amounts of land that were left uncultivated due to the lack of peanut seed. It also appears that farmers in Keur Marie planted millet up to and probably beyond compound requirements. Millet is basically an unmarketed good, and the hectareage of millet cultivation per compound in Keur Marie exceeds that in Keur Magaye. Attempts at vegetable and melon cultivation for export to Dakar and beyond are failing due to supply and marketing constraints (for example, perishability). And it can also be argued that the structure of the tenure system (including the prohibition of land sales, rental, and mortgage) and the relative insecurity of existing tenure rights in Keur Marie make other land-investment options infeasible or unattractive. The only option open to compounds in the area is to diversify away from agriculture. In this way it seems that the added tenure insecurity in Keur Marie may be contributing to the evolution of the socio-economic structure of the area.

2. Comparison between Secure, Moderately Secure, and Insecure Field Managers

The focus of the study now shifts from the village to the compound level and to an evaluation of the role of secure, moderately secure, and insecure field managers in production processes.

Examination of production by field manager reveals the extent to which the manager classification correlates with millet and peanut production. Secure fields tend to be planted in millet; insecure fields, in peanuts. This mirrors the fact that compound heads and independent household heads are responsible for the compound's millet production while wives and other insecure managers cultivate peanut fields for their personal income. This fact is illustrated in Table 14.

TABLE 14
Hectares by Crop and Field Security

	PEANUTS	MILLET	OTHER CROPS	TOTAL
Keur Marie:				
Secure fields	21.9704	62.0347	3.4688	87.4739
Moderately secure	1.6905	4.4541	.555	6.6996
Insecure	5.1172	.8215	.0150	5.9537
Borrowed	4.9923	15.793	1.4875	22.2728
Keur Magaye:				
Secure fields	44.3496	65.3329	4.3444	114.0269
Moderately secure	17.2453	5.2243	1.2749	23.7445
Insecure	29.8194	12.2810	.8591	42.9595
Borrowed	15.5730	9.5406	.7651	25.8787

A striking observation that emerges from Table 14 is the small amount of land allocated to moderately secure and insecure managers in Keur Marie. These managers received only 10 percent of village land in Keur Marie while in Keur Magaye they received 32 percent. Because the average composition of compounds in the two villages is almost identical (see Table 1, p. 23), the lower amount of land allocated to insecure managers is not a reflection of fewer women or dependent children in the compounds of Keur Marie. Instead, the small amount of land allocated to these managers probably reflects the difficulty that the compounds in the Keur Marie area have in acquiring peanut seed. It appears that compound heads and other secure managers plant their own peanut fields before allocating any of this scarce resource to other compound members. Evidently compound members who fall into the insecure category of field manager are also insecure in their rights to other factors of production such as peanut seed.

The organization of fields into those cultivated by secure, insecure, and moderately secure managers also allows for further exploration of the relationship between tenure security and efficient land management. The hypothesis here is that because the compound production process is splintered, a common property problem might arise. Because managers share unequally in the costs and benefits of land, economic reasoning suggests that efficient capital investment in the land might not be made and that the land could be overworked. No one will have the incentive to see that the land is worked or maintained efficiently. Each will have incentive to get the most out of the land in the limited time he/she has access to it, knowing that any improvements or special attention to land quality will be dissipated throughout the group and that the benefits which accrue to the manager who actually makes the improvements might be much lower than the cost borne by that manager. For example, those field managers with insecure or moderately secure tenure rights who tend to work a different field every year will have little incentive other than to get the most peanuts out of the land during the year that they manage it. This could be particularly true in the case of a peanut field that is passed from one wife to the next in successive years. And, where a strict rotation between millet and peanuts is maintained, the incentives of the compound head as millet overseer to make improvements in the land could also be diminished by knowing that in the off-years a nephew or wife will be using the field for personal peanut cultivation. In this scenario, the tenure security of the compound as a whole does not have much influence on the decisions of the different field managers. Whether or not the compound continues to work the land for a hundred years or if they are dispossessed tomorrow, each manager has an eye to getting the most out of his/her peanut field for the year he/she works it.

Evidence to explore this hypothesis is found in the calculation of the value of land services per hectare for the two village sections. This information is presented in Table 15. According to this calculation, the value of land services is fairly constant in Keur Magaye while in Keur Marie the difference between insecure and secure fields is quite large, almost three times larger for insecure fields. At first glance, this result is quite shocking, but because borrowed fields, for which tenure is even less secure, do not have similarly high values per hectare, this result can probably be attributed to

TABLE 15
Value of Land Services per Hectare
(in CFA)

	SECURE FIELDS	MODERATELY SECURE	INSECURE	BORROWED
Keur Marie	25,880	33,558	70,851	22,719
Keur Magaye	54,598	65,401	56,023	56,743

sampling fluctuation rather than interpreted as evidence to confirm the hypothesis. Remember that in Keur Marie only 6 hectares of insecure land were identified.

The relative equality of the other land-value calculations serves to argue against the hypothesis that managers with varying levels of individual tenure security have adopted different management schemes in reaction to their different security incentives. But again, the fact that few production innovations or land-improving technologies are available to farmers in the area makes it impossible to confirm or reject this hypothesis.

Before closing the discussion of the individual field managers, it is worthwhile noting that the mere existence of all of these managers is an important factor when any land law or prospective land-law reform is evaluated. For example, if an individualized tenure system is contemplated, the question immediately arises as to under whose name to register compound land. The most obvious choice is the compound head; his is the name that appears on all official lists, from village to cooperative. But, if all compound land is registered in the compound head's name, the primary argument for registration breaks down. The compound head becomes more secure in his control over compound land, but the other field managers are dispossessed of their tenurial rights. The hypothesized link between tenure security and efficient land management is broken. The compound head would be vested with the legal authority to sell, rent, or mortgage land, and the tenurial status of the other compound members would become very insecure. For example, in Senegal, in five of the eleven cases of registered land, the land was repossessed or is now involved in a legal proceeding because of failure to reimburse mortgage loans. In this case registration clearly presents a threat to the tenure rights of wives, brothers, sons, and the like. Managers who once had secure rights of access to particular fields would lose some of that security. Even those managers with the right of access to land in general would lose their small bundle of tenurial rights. In the sample, this translates to 35 fields that might be less efficiently managed as a result of registration in the name of the compound head.

Another registration option would be to register land in the name of the manager with the most secure rights to that particular piece of land. This would amount to compound heads, with both dependent and independent household heads having their traditional rights of access to a field legally recognized. Wives and younger compound members would again not be legally assured of continued right of access to land and their incentive structure would thus be weakened. In addition, this detailed registration strategy would pose a number of difficulties. Three of them are discussed here.

The bureaucratic machinery that would be needed to handle the complicated registration of not only compound heads but other compound members as well could prove impossible to maintain. The Senegalese bureaucracy is still processing registration claims that were filed in the two-year grace period granted by the 1964 National Domain Law. The number of requests for registration was staggering, almost 13,000, but many of these holdings had already had cadastral surveys done, and 24 years is a long time.

Second, within the compound, the distinction between where one member's tenurial bundle stops and where another's begins is often very hazy. The legal

and social battles that could result from a registration effort of this type could be overwhelming. Simple registration schemes often trigger violent boundary disputes between neighbors; a scheme to register separately holdings within the compound could cause a terrible amount of friction.

Third, to date Senegal has not experienced land-fragmentation problems like those experienced in some countries of East Africa. In Senegal, land that remains within the compound can be aggregately managed. Fields can be joined together for evaluation of a single crop, or they can be redistributed among field managers to achieve proper crop rotation. Private registration could weaken the compound structure and result in a high degree of land fragmentation.

With either system of registration, the land improvement and efficiency arguments for individual title break down when confronted with the complexity of the compound. The second justification that registration proponents advance is that registration is a necessary first step to introduce mortgage opportunities for farmers seeking to make land-improving or labor-saving investments. It could well be true that mortgage is a good vehicle for supplying credit to rural Africa, but as in any case where land could be irretrievably alienated from the compound, the tenure rights of other compound members must be protected. In the Peanut Basin, five out of the six registered landowners who had mortgaged their land had failed to make the loan payments and their land was repossessed or is currently the subject of a court action.

Registration done with a scalpel might be able to achieve improvements in tenure security and access to rural credit, but registration that does not cut finely enough to guarantee the protection of all of the compound members' rights to land could prove disruptive and detrimental to proper land management.

CHAPTER FIVE

CONCLUSIONS

This study represents a thorough investigation into the relationship between land-tenure security and efficient land management. Every aspect of the compound's production process and every detail of the socioeconomic structure of the sample areas were reconstructed. In order to characterize correctly the tenure systems in the area, individual land-tenure rights were enumerated and both the compound head (master of hatchet) and other members of the compound (field managers) were questioned as to their bundle of tenurial rights. Despite the thoroughness of the investigation, however, the hypothesized relationship between tenure security and efficient land management did not manifest itself. Neither in the registered sample nor in the comparison between the relatively insecure compounds of Keur Marie and the secure compounds of Keur Magaye did secure tenure result in more land-saving investments, more efficient land allocation, or, as evidenced by the registered sample, the prudent use of mortgage credit. Nor was it possible to discern a difference in management practices within the compound among those field managers with secure, moderately secure, or insecure rights to compound land.

What did become evident through this study is the array of constraints that confront the Peanut Basin farmers: environmental degradation, the unavailability or even inappropriateness of land-saving technologies, the absence of a market structure to support commerce in crops other than peanuts, and a poorly functioning input-distribution system which makes the expansion of peanut cultivation and the introduction of other cash crops almost impossible. All of these constraints combine to decrease to zero land-management options in the Basin. The first conclusion of this study, therefore, is that though land-tenure insecurity might be a constraint to efficient land management at some point in the future, it is not yet the binding constraint in Senegal's Peanut Basin.

Although not yet manifesting itself at the micro level, it does appear that the tenure insecurity expressed by the farmers in Keur Marie could be contributing to the evolution of the socioeconomic structure of the area. It is hypothesized that because of the numerous constraints and insecurities faced by the farmers in Keur Marie, they have had no choice but to diversify away from agriculture and into other income-earning activities. The farmers of the relatively secure section of Keur Magaye have not had to diversify to the extent of those in Keur Marie.

The final conclusion of this study centers around the complex nature of the compound's internal land-tenure system. The fact that women, older relatives, poor relations, and other "marginal" compound members all have rights to compound land underlines the need for careful study when initiating land-tenure reform. Tenure rules determine access to a means of production and as

such they help to define who is rich and who is poor. They help to assure employment for the able, social security for the old and disabled, and welfare for the poor. It is necessary to weigh carefully the costs and gains to society that might accompany any change in the tenure system. The costs and benefits of any policy change should be fully evaluated; land tenure reform is no different.

BIBLIOGRAPHY

- Abelin, Philippe. 1979. "Domaine national et développement au Sénégal." Bulletin de l'IFAN (Institut Fondamental d'Afrique Noire), Ser. B, vol. 41, pp. 508-538.
- Adelman, Irma, Edward Taylor, and Stephen Vogel. 1987. "Life in a Mexican Village: A SAM Perspective." Working paper. Berkeley: University of California at Berkeley, May.
- Ba, Aly Cire. 1958. "Quelques considerations*sur la Loi relative au domaine national au Sénégal." Revue Senegalaise de Droit, no. 3 (June), pp. 56-63.
- Barrows, R. 1973. "Individualized Land Tenure and African Agricultural Development Alternatives for Policy." LTC Paper, no. 85. Madison: Land Tenure Center, University of Wisconsin.
- Beghin, John. 1988. "A Game Theoretic Model of Agriculture and Food Price Policies in Senegal." Ph.D. dissertation, University of California at Berkeley.
- Berry, Albert R., and William R. Cline. 1979. Agrarian Structure and Productivity in Developing Countries. Baltimore: Johns Hopkins University Press.
- Bloch, Peter et al. 1985. "Land Tenure Issues in River Basin Development in Sub-Saharan Africa." LTC Research Paper, no. 90. Madison: Land Tenure Center, University of Wisconsin, 1985.
- Bohannon, Paul. 1973. "'Land', 'Tenure' and Land Tenure." LTC Reprint, no. 105. Madison: Land Tenure Center, University of Wisconsin.
- Bruce, John, Louise Fortmann, and James Riddell. 1985. "Trees and Tenure: An Introduction." In Trees and Tenure: An Annotated Bibliography for Agroforesters and Others, edited by Louise Fortmann and James Riddell, pp. vii-xvii. Madison: Land Tenure Center, University of Wisconsin, and Nairobi: International Council for Research in Agroforestry, January.
- Cohen, J.M. 1980. "Land Tenure and Rural Development in Africa." In Agricultural Development in Africa, edited by Robert H. Bates and Michael F. Lofchie, pp. 349-400. New York: Praeger.
- Commission de Réforme du Régime Foncier. 1960. "Eléments et documentation pour une réforme agraire rural foncière du Sénégal." Dakar, March.
- Comité d'Etudes Economiques. 1959. "La question foncière rurale au Sénégal." In Etudes sur le Milieu Rural Problèmes: Particuliers du Paysannat. Dakar, 1959. Archives Nationales du Sénégal, PO I, 4ei 174 #3.

- DeWeerd, Guido. 1979. "Revolution foncière et structure de base au Sénégal." ALA: Afrika, Latijns Amerika, Azie, vol. 6, pp. 1-24.
- Diop, Abdoulaye. 1968. "La tenure foncière en milieu rural Wolof (Sénégal): historique et actualité." Notes Africaines, no. 118 (April), pp. 48-52.
- Dorner, Peter. 1970. "Research Issues in Agricultural Development Policy." AID Spring Review of Land Reform. Washington: Agency for International Development.
- Dorner, Peter, and Don Kanel. 1970. "The Economic Case for Land Reform." AID Spring Review of Land Reform, 2-4 June 1970. SR/LR/A-3. Washington: Agency for International Development, June.
- Food and Agriculture Organization (FAO). 1964. "Report of the Development Center on Land Policy for West African Countries." Freetown, Sierra Leone, 28 December-9 January.
- Ghai, Dharam. 1979. Agrarian Systems and Rural Development. London: MacMillan.
- Hesseling, Gerti. 1984(?). Le Droit Foncier au Sénégal. The Netherlands: African Studies Centre.
- Jouhand, Yves. 1966. "La notion de domaine ou patrimoine collectif national dans les nouvelles législations du Sénégal et du Camérout: essai de synthèse entre le droit foncier coutumier et le droit foncier moderne." Revue Juridique et Politique d'Outre-Mer 20: 30-53.
- Lapeyre, Charles. 1976. "Aperçu de la Loi No. 76-66, Portant Code du Domaine de l'Etat du Sénégal." Annales Africaines, pp. 83-117.
- Long, Erven J. 1970. "Economic Basis of Land Reform in Underdeveloped Countries." USAID Spring Review of Land Reform; Background Paper, 12:6, 11 p.
- M'Baye, Keba. 1971. "Le régime des terres au Sénégal." In Le Droit de la Terre en Afrique, UNESCO, pp. 131-157. Paris: Editions G.-P. Maisonneuve et Larousse.
- M'Bengue, Aboune Badara. 1965. "La réforme foncière et agraire au Sénégal." Penant, no. 707 (January-February-March), pp. 297-303.
- Ministère du Plan et du Développement. Commission Interministerielle d'Etude de l'Application de la Loi sur le Domaine National. 1967. "Réalité sociojuridique et agro-économique." Daker, 14 February.
- Niang, Mamadou M. "Réflexions sur la réforme foncière sénégalaise de 1964." 1982. In Enjeux Fonciers en Afrique Noire, edited by E. LeBris, E. LeRoy, and F. Leimdorfer, pp. 219-227. Paris: Karthala.
- _____. 1979. "Régime des terres et stratégie de développement rural au Sénégal (un exemple de la résistance du droit coutumier africain)." African Perspectives, no. 1, pp. 45-51.

- Noble, B.P. 1965. "Mémoire sur quelques aspects du régime foncier au Sénégal, en Angleterre et en Gamie." Annales Africaines, pp. 229-249.
- Norman, D.W. et al. 1981. Farm and Village Production Systems in the Semi-Arid Tropics of West Africa: An Interpretive Review of Research. Patanchern, Andhra Pradesh, India: International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
- Peytavin, A. 1963. Project de Loi: Portant Création et Organisation du Domaine National--Exposé des Motifs. Dakar: Ministère des Finances et des Affaires Economiques.
- Podedworny, Henryk. 1974. "The Customary Land Tenure: Selected Problems of Agrarian Reform and Agricultural Development Countries of Africa South of the Sahara." LTC Reprint, no. 111. Madison: Land Tenure Center, University of Wisconsin.
- Sachs, Ignacy, ed. 1964. Agriculture, Land Reforms and Economic Development. Warsaw: Polish Scientific Publishers.
- Simpson, S. Rowton. 1976. Land Law and Registration. Cambridge: Cambridge University Press.
- Subramanian, Shankar. 1988. "Production and Distribution in a Dry-land Village Economy in the West Indian Daccan." Ph.D. dissertation, University of California at Berkeley.
- Verdier, R. 1965. "Problèmes fonciers sénégalais." Penant, no. 706 (April-June), pp. 271-281, and no. 708-709 (October-December), pp. 549-553.
- World Bank (International Bank for Reconstruction and Development, IBRD). 1976. Senegal: Tradition, Diversification, and Economic Development. Washington: IBRD.

APPENDIX ONE

QUESTIONNAIRE

Previous Page Blank

APPENDIX ONE

QUESTIONNAIRE

I. Compound CharacteristicsLocation:

Village name

Human Characteristics:

For each compound member, determine: ethnicity, official office, age, religion, religious brotherhood, literacy, relation to compound head, and occupation. List number of males, females, children (less than 15 years old), elderly (greater than 65 years old), and number of households in the compound. Collect information on hired help.

Capital Stock:

Animals and equipment.

Extra-Agricultural Income:

For each compound member employed outside the compound, describe the type, location, and duration of the job. Give income amounts for 1984, 1985, and 1986. For people who are not members of the compound but who regularly contribute to the compound, describe the type, location, and duration of the job. Give the amount remitted to the compound in 1984, 1985, and 1986.

Food Crain Purchases and Gifts:

Give the amount of millet, sorghum, and rice which was purchased and the amount given to the compound in 1986. List sources.

Domain Law:

Determine the compound head's opinion of the law. Have they had any land disputes? Do they still lend land? Leave land in fallow? Do they follow the law?

Previous Page Blank

Nom de Chef de l'exploitation _____ No. _____
 Nom de l'Enquêteur _____ Date _____

INTERVIEW I : COMPOUND CHARACTERISTICS

[Demander au chef de l'exploitation.]

Village _____

Section villageoise _____

Communauté rural _____

Arrondissement _____

Département _____

Région _____

1. Nom du chef de l'exploitation _____

2. Code d'identification _____

3. Ethnie du CE _____

1. Wolof
2. Sérère
3. Pular
4. Manding
5. Autre

4. Est-ce que le CE a des fonctions officielles (sois traditionnelles, gouvernementales, politique, commerciales, religieuse, etc.)? Expliquez:

5. Combien de ménages y a-t-il dans l'exploitation? _____

[Esquisser ci-dessous la composition de chaque ménage. Commercer par le ménage du chef de l'exploitation]

Previous Page Blank

Nom de Chef de l'exploitation _____ No. _____
Nom de l'Enquêteur _____ Date _____

Main d'Oeuvre Supplémentaire

1. Avez-vous engagé des navétanes l'année dernière? _____
(Oui - 1; Non - 2)

2. Pouvez-vous m'expliquer comment ça marche chez vous?

3. Avez-vous engagé des firdou l'année dernière? _____
(Oui - 1; Non - 2)

4. Pouvez-vous m'expliquer comment ça marche chez vous?

Nom de Chef de l'exploitation _____ No. _____
 Nom du Chef de ménage _____ No. _____
 Nom de l'Enquêteur _____ Date _____

Equipement Agricole

1. Est-ce que le ménage possédé (indiquer le nombre):	<u>Possédé</u>	<u>Confié</u>
Charrette à boeuf	_____	_____
Charrette à cheval	_____	_____
Charrette à ane	_____	_____
Semoir	_____	_____
Polyculteur	_____	_____
Houe Sine 9	_____	_____
Houe Sine 7	_____	_____
Houe occidentale	_____	_____
Arara	_____	_____
Canadien Arara	_____	_____
Ariana complète	_____	_____
Charrue	_____	_____
Hiler	_____	_____
Souleveuse artisanale	_____	_____
Souleveuse firdou	_____	_____
Autres	_____	_____

2. Si on vous a confié d'équipement, quel sont des modalités de prêt?

Nom de Chef de l'exploitation _____ No. _____
 Nom du Chef de ménage _____ No. _____
 Nom de l'Enquêteur _____ Date _____

Cheptel de Trait et d'Élevage

	1	2	3	4	5	6	7	8	9
Boeufs de trait									
Boeufs d'élevage									
Chevaux									
Anes									
Chèvres									
Moutons									
Porcs									
Poulets									

- Combien de chaque animal appartiennent au ménage?
- Combien de chaque animal sont confié au ménage?
- A qui appartiennent ces animaux? (Mettre le nombre possédé par chaque propriétaire.)

1. le ménage (entier)	6. CE
2. le Cm	7. une femme de l'exp.
3. une femme du ménage	8. un homme de l'exp.
4. un homme de ménage	9. voisin
5. exploitation (entière)	10. autre
- Arrive-t-il que le ménage vaccine systématiquement ces animaux? (Marquer le nombre de chaque espèce vaccinez.)
- Si possible, déterminez le coût de vaccination pour chaque espèce.
- Qui s'occupe des animaux pendant l'hivernage?

1. enfant du ménage (15)	6. homme de l'exp.
2. une femme du ménage	7. enfant de voisin
3. un homme du ménage	8. voisin
4. enfant de l'exp. (15)	9. autre
5. une femme du l'exp.	
- Combien d'heures par jour faut-il les surveiller pendant l'hivernage?
- Qui s'occupe des animaux pendant la saison sèche? (voir 6)
- Combien d'heures par jour faut-il les surveiller pendant la saison sèche?

Nom de Chef de l'exploitation _____ No. _____
 Nom du Chef de ménage _____ No. _____
 Nom de l'Enquêteur _____ Date _____

Activités Extra-Agricole

1. Je vois qu'il y a des membres de ménage que font du _____ (voir en base) .
 Pouvez-vous estimer le revenu (profit) gagné par ces entreprises?

	1986	1985	1984
Commerce/bana bana	_____	_____	_____
Artisanat	_____	_____	_____
Pêche	_____	_____	_____
Autre	_____	_____	_____

[Remplir des questions ci-dessous pour chaque entreprise.]

Entreprise _____

2. Quelles sont les dépenses nécessaires pour faire marcher cette entreprise?

	<u>Dépenses Fixtes</u>	<u>Dépenses Variables</u>
1.	_____	_____
2.	_____	_____
3.	_____	_____

3. D'où viennent des fonds pour payer ces dépenses? _____

4. Estimez le nombre de jours par mois ou les gens du ménage s'occupent de ces activités (y compris le temps qu'il faut pour voyager au marché et pour vendre).

Transferts Familiaux

Nom de Chef de l'exploitation _____ No. _____
 Nom du Chef de ménage _____ No. _____
 Nom de l'Enquêteur _____ Date _____

S'il y'a des travailleurs salariés dans le ménage, expliquer leur travail (ci-dessous).

Noms	Travail Contractuel			Lieu	Date d'engagement	Salaire	Durée contrat
	Mbidaan	Samane	Autres				

Observations:

Dans ce tableau ci-dessous, il s'agit de travailleurs salariés exerçant hors de l'exploitation et qui régulièrement viennent en aide à celle-ci.

Noms	Lien de parenté avec CE	Nature du travail	Lieu de travail	Date d'engagement	Fonds envoyés au ménage en		
					1986	1985	1984

Observations:

Nom de Chef de l'exploitation _____ No. _____

Nom de l'Enquêteur _____ Date _____

Questions sur la Loi sur le Domaine National

1. Quel avantage avez-vous sur la Loi du Domaine National?

2. Quel inconvénient avez-vous sur la Loi du Domaine National?

3. Observations sur la Loi:

Nom de Chef de l'exploitation _____ No. _____
 Nom de l'Enquêteur _____ Date _____

L'Affectation de Terre - Le Prêt

[A remplir si l'exploitation n'a pas prêté de terre cette année.]

1. A l'exploitation une fois emprunter de terre? _____
 (1 - oui; 2 - non)
2. A l'exploitation une fois prêté une parcelle? _____
 (1 - oui; 2 - non)

[Remplir les questions ci-dessous pour chaque parcelle qu'on a prêtée.]

3. A qui a l'exploitation prête la parcelle? _____
 1. quel qu'un de la famille qui n'est pas membre du l'exp.
 2. voisin
 3. autre
4. Pour combien de temps a l'exploitation prêté la parcelle? _____
5. Qu'est-ce que l'exploitation a reçu comme paiement? _____
 1. rien
 2. argent espèce
 3. travail
 4. échange en nature
 5. autre
6. Qui a mis en fin au prêt? _____
 1. CE
 2. chef du ménage que "possédé" la parcelle
 3. tout l'exp.
 4. l'emprunteur
 5. autre
7. Pour quelle raison a-t-on mis en fin au prêt?

Nom de Chef de l'exploitation _____ No. _____

Nom de l'Enquêteur _____ Date _____

L'Affectation de Terre - La Vente et l'Hypothèque

8. A l'exploitation une fois vendu une parcelle? _____
(1 - oui; 2 - non)
9. A qui a l'exp. vendu la parcelle? _____
1. quel qu'un de la famille qui n'est pas membre du l'exp.
2. voisin
3. autre
10. A-t-on enregistré la vente? _____
1. oui, avec les autorités traditionnelles
2. oui, avec le gouvernement
3. non
11. Que a décidé de vendre la parcelle? _____
1. CE
2. chef du ménage que possédé la parcelle
3. toute l'exploitation
4. autre
12. A l'exp. une fois hypothéqué une parcelle? _____
(1 - oui; 2 - non)
13. Si oui, expliquez la situation

14. Avez-vous une fois pratiqué la jachère? _____
(1 - oui; 2 - non)
15. Pourquoi vous ne la pratiquez plus?

16. Avez-vous une fois rencontré une dispute de terre? Racontez.

II. Compound Tenure by Parcel

Parcel Characteristics:

Distance from compound, who cleared the parcel, any improvements, who made improvements, years the compound has "owned" the parcel, how the parcel was obtained.

Borrowed:

If yes, determine owner, years borrowed, if the compound will borrow the same parcel next year, is there payment made for the use of the parcel, a contract, in case of dispute who will arbitrate, and if the owner can take back the land at any time.

Lent:

If yes, determine who borrowed the parcel, who decided to lend the land and why, years lent to this borrower, total years lent, if the parcel will be lent next year, does the compound receive payment for the parcel, is there a contract, in case of dispute who will arbitrate, and if the compound can take back the land at any time.

Fallow:

If yes, determine the number of years the parcel has been in fallow, why it is in fallow, and the security of the fallow land.

Nom de Chef de l'exploitation _____ No. _____
 Nom du Chef de ménage _____ No. _____
 Nom de l'Enquêteur _____ Date _____

INTERVIEW II : SITUATION FONCIERE DU CARRE

Section A.

[Demander au chef de ménage de vous montrer les terres appartenant au ménage. Compléter les questions ci-dessous pour chaque parcelle.]

1. Parcelle _____
2. Identification (nom) et lieu de la parcelle _____
 Approbation de la parcelle _____
 1. possédée et cultivée par le ménage
 2. cultivée mais pas possédée par le ménage
 3. possédée mais pas cultivée par le ménage (continuer à la section D)
3. Qui a haché la parcelle? _____
 1. CE
 2. père du CE
 3. grand-père du CE
 4. autre
 5. je ne sais pas
4. A quel qu'un amélioré cette parcelle? _____
 1. non
 2. arbres
 3. clôture
 4. puits
 5. parcage
 6. autre
5. Qui a opéré ces améliorations? _____

6. Combien de champs y a-t-il dans la parcelle? _____

	A	B	C	D
7. Superficie du champ	_____	_____	_____	_____
8. Culture	_____	_____	_____	_____
9. Qui est le responsable du champ?	_____	_____	_____	_____
10. Ménage	_____	_____	_____	_____
11. Status	_____	_____	_____	_____
12. Qualité du sol:	1. dior	_____	_____	_____
	2. deck	_____	_____	_____
	3. deck/dior	_____	_____	_____

[Si la parcelle est en jachère, continuer à la section B.]

[Si la parcelle est cultivée mais pas possédé par le ménage, continuer à la section C.]

Previous Page Blank

Nom de Chef de l'exploitation _____ No. _____
Nom du Chef de ménage _____ No. _____
Nom de l'Enquêteur _____ Date _____

Section B

1. Identification de la parcelle _____
2. Depuis combien d'années est la parcelle en jachère? _____
3. Pourquoi? _____

4. Comme la parcelle est en jachère, peut quel qu'un vous retirer la parcelle afin de la cultiver? Expliquez.

Nom de Chef de l'exploitation _____ No. _____
 Nom du Chef de ménage _____ No. _____
 Nom de l'Enquêteur _____ Date _____

Section C

[Remplir la section C si la parcelle est cultivée mais pas possédée par le ménage.]

1. Identification de la parcelle _____
2. A qui appartient la parcelle? _____
 1. un membre de la famille habitant hors de l'exp.
(lien parenté _____)
 2. un voisin
 3. autre
3. Comment avez-vous obtenu cette parcelle?

4. Vous exploitez cette parcelle depuis combien d'années? _____
5. Pensez-vous la conserver l'année prochaine? _____
 1. oui
 2. non
 3. je ne sais pas
6. Est-ce qu'il y a une contre-partie pour l'usage de la parcelle? _____
 1. pas de contre-partie
 2. contre argent
 3. contre travail (expliquez)
 4. échange en nature
 5. autre
7. Décrivez ci-dessous le genre de contre-partie.

8. Est-ce que le ménage a signé un contrat pour l'exploitation de cette parcelle? (1 - oui; 2 - non) _____
9. En cas de conflit qui aura la charge du trancher? _____
 1. "entre nous"
 2. autorité traditionnelle
 3. conseil rural
 4. préfet
 5. autre
10. De propriétaire, peut-il à tout moment retirer sa parcelle? Expliquez.

Nom de Chef de l'exploitation _____ No. _____
 Nom du Chef de ménage _____ No. _____
 Nom de l'Enquêteur _____ Date _____

Section D

[Remplir la section D si la parcelle appartient au ménage mais n'est pas exploitée par un membre de l'exp.]

1. Identification de la parcelle _____
2. Superficie de la parcelle _____
3. Qui a haché la parcelle? _____
 1. CE
 2. père du CE
 3. grand-père du CE
 4. autre
 5. je ne sais pas
4. A quel qu'un amélioré cette parcelle? _____
 1. arbres
 2. clôture
 3. puits
 4. parcage
 5. autre
 6. non
5. Qui a opéré ces améliorations? _____

6. Qui exploite cette parcelle? _____
 1. quelqu'un de la famille habitant hors de l'exp.
 (lien parenté _____)
 2. un voisin
 3. autre
7. Qui a décidé a prêter cette parcelle? _____
 1. CE
 2. chef du ménage propriétaire de la parcelle
 3. autre
8. Pourquoi n'exploitez-vous pas la parcelle?

9. Depuis combien d'années est-ce que l'emprunteur exploite cette parcelle? _____

Nom de Chef de l'exploitation _____ No. _____
 Nom du Chef de ménage _____ No. _____
 Nom de l'Enquêteur _____ Date _____

Section D (cont.)

10. Qui exploitera cette parcelle l'année prochaine? _____
 1. le même individu que cette année
 2. un membre de l'exp.
 3. autre
11. Depuis combien d'années est-ce que l'exp. a cessé d'exploiter cette parcelle? _____
12. Est-ce qu'il y a une contre-partie pour l'usage de la parcelle? _____
 1. pas de contre-partie
 2. contre argent espèces
 3. contre travail
 4. échange en nature
 5. autre
13. Décrivez ci-dessous le genre de contre-partie.

14. Est-ce que vous avez signé un contrat avec l'emprunteur de la parcelle? (1 - oui; 2 - non) _____
15. En cas de dispute, qui aura la charge du trancher? _____
 1. "entre nous"
 2. autorité traditionnelle
 3. conseil rural
 4. préfet (autorité administrative)
 5. autre
10. Pouvez-vous retirer à tout instant sa parcelle? Expliquez.

III. Field Management and Tenure

Field Characteristics:

Size and soil quality.

Crops:

Amounts planted and harvested in 1984, 1985, and 1986.

Crop and Input Management:

Who determined crop, quantity of seed planted, fertilizer use, and quantity of pesticide used? What amounts were applied? What and how much was planted and harvested on this field in 1985 and 1984?

Tools Used on Field:

List type and quantity. If borrowed, list payment amount.

Animals Used on Field:

List type and quantity. If borrowed, list payment amount.

Labor Inputs:

List who did each type of task (soil preparation, harvest, first weeding, second weeding, unearthing, stacking, and beating), how long they worked, and if they received any payment. Was there a labor shortage for any task? Why?

Field Manager Tenure Status:

Determine the number of years the manager has worked the field, how the field was obtained, if there has been a change in the size of the field, who made the change, if the manager will work the same field next year, who could take the field from the manager, if they will take the field, if the manager's children will work this field, who decides the heirs to the field, and if the manager can give or loan the field.

Previous Page Blank

Nom de Chef de l'exploitation _____ No. _____
 Nom du Responsable du champ _____ No. du champ _____
 Nom de l'Enquêteur _____ Date _____

INTERVIEW III : FIELD MANAGEMENT AND TENURE

[Remplir pour chaque responsable, chaque champ.]

1. Nom de responsable _____
2. Nombre de la parcelle _____
3. Identification de la parcelle _____
4. Combien de champs y a-t-il dans la parcelle? _____
5. No. du champ _____

	A	B	C
6. Qu'est-ce que vous avez cultivé dans ce champ?	_____	_____	_____
7. Quelle quantité de semence avez-vous semée?	_____	_____	_____
8. Quelle quantité avez-vous récoltée?	_____	_____	_____

9. Qui détermine ce que vous cultivez sur ce champ? _____
 1. moi-même
 2. chef du ménage
 3. chef de l'exploitation
 4. autre
10. Qui détermine la quantité de semence semée? (voir en haute) _____
11. Quelle quantité d'engrais avez-vous épandue sur ce champ?
 1. engrais arachide (8.18.27; 6.20.10; 0.15.10) _____
 2. engrais mil (14.7.7; 0.15.20) _____
 3. autre _____
12. Qui a déterminé la dose d'engrais que vous avez épandue? _____
 1. moi-même
 2. chef du ménage
 3. chef de l'exploitation
 4. autre
13. Est-ce que cette quantité vous a suffi? _____
 (1 - oui; 2 - non)
14. Qui a déterminé la dose d'urée que vous avez épandue? (voir en haut) _____
15. Est-ce que cette quantité vous a suffi? _____
 (1 - oui; 2 - non)
16. Quelle quantité de pesticide avez-vous utilisée sur ce champ? _____
17. Qui a déterminé la dose de pesticide mise? (voir no. 12) _____
18. Est-ce que cette quantité vous a suffi? _____
 (1 - oui; 2 - non)

Previous Page Blank

Nom de Chef de l'exploitation _____ No. _____
 Nom du Responsable du champ _____ No. du champ _____
 Nom de l'Enquêteur _____ Date _____

Section A

20. Avec quels outils avez-vous exploité ce champ? [Remplir le tableau.]

Utile employés	#	Propriétaire	Genre de paiement	Montant
1. Charrette				
2. Semoie				
3. Polyculteur				
4. Houe sine 9				
Houe sine 7				
Houe occidentale				
5. Arara				
6. Canadien arara				
7. Hiler				
8. Ariana				
9. Souleveuse artisanale				
10. Souleveuse firdou				
11. Batteuse				
12. Autre				

Propriétaire

1. moi-même
2. chef du ménage
3. un autre du ménage
4. CE
5. un autre de l'exp.
6. voisin
7. gouvernement
8. autre

Genre de paiement

1. rien
2. argent espèce
3. travail
4. échange en nature
5. autre

20. Animaux de traction utilisés

	#	Propriétaire	Genre de paiement	Montant
1. Cheval				
2. Boeuf				
3. Ane				

Nom de Chef de l'exploitation _____ No. _____
 Nom du Responsable du champ _____ No. du champ _____
 Nom de l'Enquêteur _____ Date _____

Section A

21. Qui a fait la préparation du sol du champ?

Nom	Stat.	Jours de travail	Genre de paiement

- | <u>Status de travailleur</u> | <u>Genre de paiement</u> |
|--|--------------------------|
| 1. Responsable du champ | 1. pas de paiement |
| 2. Homme du ménage du responsable du champ | 2. argent espèce |
| 3. Femme du ménage du responsable du champ | 3. travail |
| 4. Enfant (15 ans) du ménage du responsable du champ | 4. échange en nature |
| 5. Homme de l'exploitation | 5. autre |
| 6. Femme de l'exploitation | |
| 7. Enfant (15 ans) du carre | |
| 8. Membre de la famille habitant hors de l'exploitation (preciser) | |
| 01. Voisin | |
| 02. Voisine | |
| 03. Enfant (15 ans) du voisin | |
| 04. Navétane | |
| 05. Firdou | |
| 06. Collectivité | |
| 07. Autre (que n'est pas membre de la famille) | |

22. Dans ce champ, qui a:

Nom	Semé #1		
	Stat	Jours Trave	Genre Paie

23. Dans ce champ, qui a:

Nom	Récolte #1		
	Stat	Jours Trave	Genre Paie

Nom de Chef de l'exploitation _____ No. _____

Nom du Responsable du champ _____ No. du champ _____

Nom de l'Enquêteur _____ Date _____

Section A

24. Dans ce champ, qui a :

Nom	Semé #2		
	Stat	Jours Trave	Genre Paie

25. Dans ce champ, qui a :

Nom	Récolte #2		
	Stat	Jours Trave	Genre Paie

26. Qui a fait du sarclage?

Nom	Stat.	Jours de travail	Genre de paiement

27. Le premier épandage d'engrais:

Nom	Stat	Jours Trave	Genre Paie

28. Le binage:

Nom	Stat	Jours Trave	Genre Paie

29. Le deuxième épandage d'engrais:

Nom	Stat	Jours Trave	Genre Paie

30. Le soulevage:

Nom	Stat	Jours Trave	Genre Paie

Nom de Chef de l'exploitation _____ No. _____
 Nom du Responsable du champ _____ No. du champ _____
 Nom de l'Enquêteur _____ Date _____

Section A

31. Qui a fait le battage?

Nom	Stat	Jours Trave	Genre Paie

32. Qui a fait le fanage?

Nom	Stat	Jours Trave	Genre Paie

33. Est-ce que la main-d'oeuvre que vous avez engagé a été suffisante? _____
 (1 - oui; 2 - non)

34. Si non, pour quels genres de travaux avez-vous en besoin de main-d'oeuvre
 supplémentaire?

35. Pourquoi n'avez-vous pas engagé suffisamment de main-d'oeuvre
 pour ces travaux? _____

1. trop cher
2. manque de moyen
3. manque de travailleurs
4. autre

36. Vous cultivez ce champ depuis combien d'années (première année = 1) _____

37. Comment avez-vous obtenu ce champ? _____

1. acheté ou hypothéqué
2. chef du ménage m'a donné
3. chef de l'exploitation m'a donné
4. chef du village autorité traditionnelle m'donné
5. autorités administratives (conseil rural) m'a donné
6. autre (expliquez)

[Si c'est la première année, continuer à question 44]

38. Est-ce que les dimensions du champ ont changées? _____
 (1 - oui; 2 - non)

39. Si oui, comment ont-elles changées? _____

Nom de Chef de l'exploitation _____ No. _____
 Nom du Responsable du champ _____ No. du champ _____
 Nom de l'Enquêteur _____ Date _____

Section A

40. Qui a ordonné le changement? _____
 1. chef du ménage
 2. chef de l'exploitation
 3. chef du village autorité traditionnelle
 4. autorités administratives (conseil rural)
 5. autre
41. Pourquoi? _____
 Qu'est-ce vous avez cultivé sur ce champ en:
- | 42. 1985 | | | 43. 1984 | | |
|----------|-------|----------|----------|-------|----------|
| Culture | Semée | Recoltée | Culture | Semée | Recoltée |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
44. Pensez-vous cultiver ce champ l'année prochaine? _____
 (1 - oui; 2 - non)
45. Si oui, qu'y cultiverez-vous l'année prochaine? _____
46. Qui peut vous retirer ce champ? _____
 1. personne
 2. chef du ménage
 3. chef de l'exploitation
 4. la famille
 5. chef du village (responsables traditionnels)
 6. autorités administratives
 7. autre
47. Pensez-vous que on vous le retire? _____
 (1 - oui; 2 - non; 3 - je ne sais pas)
48. Est-ce que vos enfants vont continuer à exploiter ce champ? _____
 (1 - oui; 2 - non; 3 - je ne sais pas)
49. Qui décide qu' sera l'héritier du champ? _____
 1. moi-même
 2. chef du ménage
 3. chef de l'exploitation
 4. famille
 5. autorités traditionnelles
 6. autorités administratives
 7. autre
50. Pouvez-vous donner le champ à quelqu'un d'autre? Expliquez.

Nom de Chef de l'exploitation _____ No. _____
 Nom du Responsable du champ _____
 Nom de l'Enquêteur _____ Date _____

INTERVIEW IV: DISTRIBUTION OF HARVEST AND REVENUE

Section A

A demander aux responsables des champs (après avoir discuté de chaque champ).

Cette année, vous avez cultivé de: (1) _____
 (2) _____
 (3) _____
 (4) _____

1. Culture: _____
2. Qui vous a fourni les semences de 1. _____ ?
 1. propre reserves
 2. chef du ménage
 3. chef de l'exploitation
 4. commerçants/bana bana
 5. cooperative ou encadrement rural
 6. marabout
 7. autre
3. Quelle quantité de semence avez-vous eu? _____
4. Quand avez-vous eu ces semences? _____
5. Quel genre de paiement (ou échange) avez-vous rendu pour ces semences?
 1. rien _____
 2. argent espèce _____
 3. travail _____
 4. échange en nature _____
 5. autre _____
6. Indiquez le montant du paiement et la date du paiement. _____

7. Si le paiement s'effectue a crédit, quelle garantie avez-vous fournie?

8. Quelle a été la quantité totale de votre récolte de cette culture? _____
 (preciser la quantité)

Nom de Chef de l'exploitation _____ No. _____
 Nom du Responsable du champ _____
 Nom de l'Enquêteur _____ Date _____

Section B

Culture _____

9. Qu'est-ce que vous avez fait avec cette récolte? Indiquez ci-dessous la quantité.

Vous avez: 1. vendue _____
 2. gardée pour consommation personnelle _____
 3. gardée pour les semences _____
 4. gardée pour la consommation de l'exploitation _____
 5. remise au chef du ménage _____
 6. remise au chef du carré _____
 7. autre _____

11. En remettant de la production au chef de l'exploitation ou au chef du ménage, avez-vous reçu un "paiement"? Expliquez.

12. Ou avez-vous vendu cette production? _____

1. au marché
2. a la coopérative
3. aux commerçants/bana bana
4. Sonacos
5. autre

13. Comment avez-vous vendu cette récolte? _____

1. en une seule transaction
2. en plusieurs transactions durant l'année
3. autre

14. Quel prix avez-vous reçu (la pièce et en total)?

1. au marché _____
2. à la coopérative _____
3. aux commerçants _____
4. ça dépend de la période de l'année _____

15. Indiquez ci-dessous la quantité du revenu de cette récolte que vous avez.

1. gardée pur les dépenses personnelles _____
2. remise au chef du ménage _____
3. remise au chef de l'exploitation _____
4. autre _____

[Si la culture est foin d'arrachide, demander les questions ci-dessous.]

16. Est-ce que votre foin vous suffira pour couvrir vos besoins? _____

(1 - oui; 2 - non)

17. Si non, comment arriverez-vous à les couvrir? _____

Nom de Chef de l'exploitation _____ No. _____
 Nom du Responsable du champ _____
 Nom de l'Enquêteur _____ Date _____

Section B

18. Qui vous a fourni les pesticides? _____
 1. chef du ménage
 2. chef d'exploitation
 3. commerçants
 4. encadrement technique
 5. marabout
 6. autre
19. Quelle quantité de pesticide avez-vous eu? _____
20. Quand avez-vous eu la pesticide? _____
21. Quelle genre de paiement (ou échange) avez-vous rendu pour les pesticides? _____
 1. rien
 2. argent espèces
 3. travail
 4. échange en nature
 5. autre
22. Indiquez le montant du paiement et la date du paiement.
-
23. Qui vous a fourni les engrais? _____
 1. chef du ménage
 2. chef d'exploitation
 3. commerçants
 4. encadrement technique ou coopérative
 5. marabouts
 6. autre
24. Quelle quantité d'engrais avez-vous eu? _____
25. Quand avez-vous eu les engrais? _____
26. Quel genre de paiement (ou échange) avez-vous rendu pour les engrais? _____
 1. rien
 2. argent espèces
 3. travail
 4. échange en nature
 5. autre
27. Indiquez le montant du paiement et la date du paiement.
-
28. Si le paiement s'effectue à crédit, quelle garantie avez-vous fournie? _____
-

IV. Distribution of Harvest and Revenue by Manager:**Acquisition of Seeds:**

List source, quantity obtained, type of payment, credit, cost.

Division of Harvest:

List percentage of harvest that was sold, kept for personal use, used for seed, kept for general compound use, given to compound head, tithed or other.

Sales Procedure:

Determine where the crop was sold and in how many transactions.

Amount of Sales Revenue:

List CFA amount.

Division of Sales Revenue:

List the percentage of sales revenue that was kept for personal use, given to the compound head, given to the household head, tithed, used for loan repayment or other.

Pesticide and Fertilizer Acquisition:

Determine source, quantity, payment type, credit, and payment amount.

APPENDIX TWO

TABLE 1: LAND AREAS PER COMPOUND, KEUR MARIE

TABLE 2: LAND AREAS PER COMPOUND, KEUR MAGAYE

TABLE 3: ANIMAL STOCK: ANIMALS OWNED, BY EACH COMPOUND TYPE

Previous Page Blank

TABLE 1

Land Areas per Compound, Keur Marie
(in hectares)

COMP. #	O W N E D				B O R R O W E D	
	Operated	Fallow	Lent	Total	Operated	Fallow
01	10.5133	0.5723	0	11.0856	.3910	.7756
02	0	0	0	0	2.4429.0	0
03	7.6031	.9101	0	8.5132	5.0397	0
04	8.6900	3.3750	2.6120	14.6770	1.0000	0
05	4.8784	8.3994	2.7837	16.0615	0	0
06	8.9220	0.2770	0	9.1990	0	0
07	1.6018	2.3262	0	3.9280	0	0
08	5.3423	2.4905	0	7.8328	0.2708	0
09	4.8068	1.5006	0	6.3074	0	0
10	8.5903	1.4260	0.8443	10.8606	0	0
11	14.6698	1.6702	1.7622	18.1022	5.6562	0.8465
12	0.5692	0.4031	0	0.9723	0.3116	1.6087
13	6.1339	0.5984	0	6.7323	1.3667	0
14	5.3225	0	2.0592	7.3817	0	0
15	4.5074	3.1919	0.5710	8.2703	0	0
16	3.5671	2.2433	0	5.8104	0.3822	0
17	0	0	0	0	2.9208	0
18	3.2866	0.6849	1.6290	5.6005	0	0
19	3.1464	0	0	3.1464	0	0
20	2.9338	0	0	2.9338	1.3536	0
21	3.3104	0.4761	0.5994	4.3859	0	0
22	12.2131	0.8137	0.4960	13.5228	0.8667	0

Previous Page Blank

TABLE 2
Land Areas per Compound, Keur Magaye
(in hectares)

COMP. #	O W N E D				B O R R O W E D	
	Operated	Fallow	Lent	Total	Operated	Fallow
25	4.9070	6.4080	8.5450	19.8600	0	0
26	5.8578	1.8761	1.4532	9.1871	0	0
27	4.8173	7.4626	2.8912	15.1711	2.1411	0
28	29.7714	8.6213	0.6520	39.0447	0	0
29	7.0167	4.9817	10.9115	22.9099	3.6577	0
30	2.3803	9.7085	0	12.0888	3.9954	0.9505
31	13.4589	26.3191	4.8935	44.6715	0	0
32	15.6786	12.6593	3.0152	31.3531	0	0
33	4.1859	4.2964	2.803	11.2853	0	0
34	15.4164	21.5942	12.1140	49.1246	0	0
35	1.1724	1.5290	3.3345	6.0359	0	0
36	0.1265	0	0	0.1265	4.6833	2.1382
37	3.3942	5.5467	0	8.9409	0	0
38	7.1102	3.4443	0	10.5545	0	0
39	2.3238	9.6894	0.8555	12.8687	0	0
40	6.5977	7.6454	0	14.2431	0.8555	0
41	4.3282	4.8644	0.5040	9.6966	0	0
42	10.5276	0.8624	0	11.3900	0.2217	0
43	11.6624	26.3488	21.6496	59.6608	3.2610	0
44	9.9089	4.9861	4.8652	19.7602	0	0
45	20.0746	9.3136	3.6552	33.0434	10.7678	0
46	12.2544	22.1974	4.7895	39.2413	1.8768	0
47	3.0512	0.5826	1.5814	5.2152	0.7088	2.2635
48	5.2130	0.8640	0.6100	6.6870	0	0
49	3.4153	1.8201	0	5.2354	3.0856	0
50	3.7781	0	1.6307	5.4088	0	0

TABLE 3

Animal Stock: Animals Owned, by Each Compound Type

	LARGE LANDHOLDERS	MEDIUM LANDHOLDERS	SMALL LANDHOLDERS
Keur Marie			
Chickens	104	98	37
Traction cattle	0	0	0
Donkeys	12	8	5
Goats	34	76	13
Sheep	20	31	8
Horses	14	10	4
Cattle	56	78	23
Keur Magaye			
Chickens	181	132	48
Traction cattle	2	0	0
Donkeys	151		
Goats	14	5	16
Sheep	53	18	25
Horses	16	15	11
Cattle	8	0	1

APPENDIX THREE

TABLE 1: SOCIAL ACCOUNTING MATRIX, KEUR MARIE

TABLE 2: SOCIAL ACCOUNTING MATRIX, KEUR MAGAYE

TABLE 3: NORMALIZED SOCIAL ACCOUNTING MATRIX, KEUR MARIE

TABLE 4: NORMALIZED SOCIAL ACCOUNTING MATRIX, KEUR MAGAYE

Previous Page Blank

TABLE 1

Social Accounting Matrix, Keur Marie
(amounts in CFA)

	1. PEANUTS	2. MILLET	3. OTHER CROPS	4. ANIMALS	5. SERVICE	6. COMMERCE
1. Peanuts	223,176.00	0.00	0.00	0.00	0.00	0.00
2. Millet	0.00	26,669.00	0.00	0.00	0.00	0.00
3. Other crops	0.00	0.00	3,165.00	0.00	0.00	40,000.00
4. Animals	218,500.00	218,000.00	22,500.00	0.00	0.00	0.00
5. Service	0.00	0.00	0.00	0.00	0.00	0.00
6. Commerce	0.00	0.00	0.00	0.00	0.00	0.00
7. Manager labor	105,920.00	269,875.00	28,550.00	0.00	0.00	0.00
8. Household labor	265,142.50	455,125.00	22,937.50	0.00	0.00	0.00
9. Compound labor	81,875.00	79,500.00	20,500.00	0.00	0.00	0.00
10. Village labor	31,000.00	100,875.00	3,000.00	12,000.00	0.00	0.00
11. Imported labor	4,875.00	11,750.00	250.00	0.00	0.00	0.00
12. Nonag. labor	0.00	0.00	0.00	396,750.00	124,500.00	296,750.00
13. Secure fields	808,612.50	1,423,700.00	31,512.50	0.00	0.00	0.00
14. Moderately secure	119,875.00	32,650.00	72,300.00	0.00	0.00	0.00
15. Insecure fields	346,775.00	11,500.00	63,550.00	0.00	0.00	0.00
16. Borrowed fields	292,875.00	222,300.00	-9,150.00	0.00	0.00	0.00
17. Grazing rights	0.00	0.00	0.00	50,250.00	0.00	0.00
18. Large compounds	19,817.00	0.00	125.00	0.00	0.00	0.00
19. Medium compounds	19,817.00	0.00	0.00	0.00	0.00	0.00
20. Small compounds	19,817.00	0.00	0.00	0.00	0.00	0.00
21. Capital/savings	0.00	0.00	0.00	0.00	0.00	0.00
22. Cooperatives	343,439.00	125.00	0.00	0.00	0.00	0.00
23. Weekly market	39,884.00	2,381.00	4,7670.00	0.00	500.00	197,500.00
24. Other Senegal	0.00	0.00	0.00	1,000.00	0.00	1,725,000.00
25. Totals	2,941,400.00	2,854,450.00	265,000.00	459,000.00	125,000.00	2,259,250.00

[continued]

[Table 1, Social Accounting Matrix, Keur Marie, cont.]

	7. MANAGER LABOR	8. HOUSEHOLD LABOR	9. COMPOUND LABOR	10. VILLAGE LABOR	11. IMPORTED LABOR	12. NONAG. LABOR
1. Peanuts	0.00	0.00	0.00	0.00	0.00	0.00
2. Millet	0.00	0.00	0.00	0.00	0.00	0.00
3. Other crops	0.00	0.00	0.00	0.00	0.00	0.00
4. Animals	0.00	0.00	0.00	0.00	0.00	0.00
5. Service	0.00	0.00	0.00	0.00	0.00	0.00
6. Commerce	0.00	0.00	0.00	0.00	0.00	0.00
7. Manager labor	0.00	0.00	0.00	0.00	0.00	0.00
8. Household labor	0.00	0.00	0.00	0.00	0.00	0.00
9. Compound labor	0.00	0.00	0.00	0.00	0.00	0.00
10. Village labor	0.00	0.00	0.00	0.00	0.00	0.00
11. Imported labor	0.00	0.00	0.00	0.00	0.00	0.00
12. Nonag. labor	0.00	0.00	0.00	0.00	0.00	0.00
13. Secure fields	0.00	0.00	0.00	0.00	0.00	0.00
14. Moderately secure	0.00	0.00	0.00	0.00	0.00	0.00
15. Insecure fields	0.00	0.00	0.00	0.00	0.00	0.00
16. Borrowed fields	0.00	0.00	0.00	0.00	0.00	0.00
17. Grazing rights	0.00	0.00	0.00	0.00	0.00	0.00
18. Large compounds	109,000.00	338,875.00	54,750.00	46,500.00	0.00	186,500.00
19. Medium compounds	169,232.50	224,392.50	125,625.00	56,375.00	0.00	447,750.00
20. Small compounds	126,112.50	179,937.50	1,500.00	44,000.00	0.00	183,750.00
21. Capital/savings	0.00	0.00	0.00	0.00	0.00	0.00
22. Cooperatives	0.00	0.00	0.00	0.00	0.00	0.00
23. Weekly market	0.00	0.00	0.00	0.00	0.00	0.00
24. Other Senegal	0.00	0.00	0.00	0.00	16,875.00	0.00
25. Totals	404,345.00	743,205.00	181,875.00	146,875.00	16,875.00	818,000.00

[continued]

[Table 1, Social Accounting Matrix, Keur Marie, cont.]

	13. SECURE FIELDS	14. MODERATELY SECURE	15. INSECURE FIELDS	16. BORROWED FIELDS	17. GRAZING RIGHTS
1. Peanuts	0.00	0.00	0.00	0.00	0.00
2. Millet	0.00	0.00	0.00	0.00	0.00
3. Other crops	0.00	0.00	0.00	0.00	0.00
4. Animals	0.00	0.00	0.00	0.00	0.00
5. Service	0.00	0.00	0.00	0.00	0.00
6. Commerce	0.00	0.00	0.00	0.00	0.00
7. Manager labor	0.00	0.00	0.00	0.00	0.00
8. Household labor	0.00	0.00	0.00	0.00	0.00
9. Compound labor	0.00	0.00	0.00	0.00	0.00
10. Village labor	0.00	0.00	0.00	0.00	0.00
11. Imported labor	0.00	0.00	0.00	0.00	0.00
12. Nonag. labor	0.00	0.00	0.00	0.00	0.00
13. Secure fields	0.00	0.00	0.00	0.00	0.00
14. Moderately secure	0.00	0.00	0.00	0.00	0.00
15. Insecure fields	0.00	0.00	0.00	0.00	0.00
16. Borrowed fields	0.00	0.00	0.00	0.00	0.00
17. Grazing rights	0.00	0.00	0.00	0.00	0.00
18. Large compounds	999,575.00	176,225.00	114,175.00	248,850.00	25,125.00
19. Medium compounds	1,051,500.00	48,600.00	307,650.00	91,500.00	17,587.00
20. Small compounds	212,750.00	0.00	0.00	165,675.00	7,538.00
21. Capital/savings	0.00	0.00	0.00	0.00	0.00
22. Cooperatives	0.00	0.00	0.00	0.00	0.00
23. Weekly market	0.00	0.00	0.00	0.00	0.00
24. Other Senegal	0.00	0.00	0.00	0.00	0.00
25. Totals	2,263,825.00	224,825.00	421,825.00	506,025.00	50,250.00

[continued]

[Table 1, Social Accounting Matrix, Keur Marie, cont.]

	18. LARGE COMPOUNDS	19. MEDIUM COMPOUNDS	20. SMALL COMPOUNDS	21. INVESTMENT	22. COOPERATIVES
1. Peanuts	109,313.00	78,811.00	3,480.00	113,407.00	2,413,213.00
2. Millet	1,079,073.00	1,093,983.00	654,725.00	0.00	0.00
3. Other crops	79,920.00	29,680.00	25,835.00	0.00	0.00
4. Animals	0.00	0.00	0.00	0.00	0.00
5. Service	68,750.00	42,500.00	13,750.00	0.00	0.00
6. Commerce	159,088.00	98,345.00	31,817.00	0.00	0.00
7. Manager labor	0.00	0.00	0.00	0.00	0.00
8. Household labor	0.00	0.00	0.00	0.00	0.00
9. Compound labor	0.00	0.00	0.00	0.00	0.00
10. Village labor	0.00	0.00	0.00	0.00	0.00
11. Imported labor	0.00	0.00	0.00	0.00	0.00
12. Nonag. labor	0.00	0.00	0.00	0.00	0.00
13. Secure fields	0.00	0.00	0.00	0.00	0.00
14. Moderately secure	0.00	0.00	0.00	0.00	0.00
15. Insecure fields	0.00	0.00	0.00	0.00	0.00
16. Borrowed fields	0.00	0.00	0.00	0.00	0.00
17. Grazing rights	0.00	0.00	0.00	0.00	0.00
18. Large compounds	0.00	0.00	0.00	0.00	0.00
19. Medium compounds	0.00	0.00	0.00	0.00	0.00
20. Small compounds	0.00	0.00	0.00	0.00	0.00
21. Capital/savings	194,015.00	113,416.00	13,476.00	0.00	0.00
22. Cooperatives	0.00	0.00	0.00	0.00	0.00
23. Weekly market	2,990,058.00	1,407,114.00	202,997.00	107,500.00	0.00
24. Other Senegal	0.00	0.00	0.00	100,000.00	0.00
25. Totals	4,680,217.00	2,863,849.00	946,080.00	320,907.00	2,413,213.00

[continued]

[Table 1, Social Accounting Matrix, Keur Marie, cont.]

	23. WEEKLY MARKET	24. OTHER SENEGAL	25. TOTALS
1. Peanuts	0.00	0.00	2,941,400.00
2. Millet	0.00	0.00	2,854,450.00
3. Other crops	0.00	86,400.00	265,000.00
4. Animals	0.00	0.00	459,000.00
5. Service	0.00	0.00	125,000.00
6. Commerce	625,000.00	1,345,000.00	2,259,250.00
7. Manager labor	0.00	0.00	404,345.00
8. Household labor	0.00	0.00	743,205.00
9. Compound labor	0.00	0.00	181,875.00
10. Village labor	0.00	0.00	146,875.00
11. Imported labor	0.00	0.00	16,875.00
12. Nonag. labor	0.00	0.00	818,000.00
13. Secure fields	0.00	0.00	2,263,825.00
14. Moderately secure	0.00	0.00	224,825.00
15. Insecure fields	0.00	0.00	421,825.00
16. Borrowed fields	0.00	0.00	506,025.00
17. Grazing rights	0.00	0.00	50,250.00
18. Large compounds	0.00	2,360,700.00	4,680,217.00
19. Medium compounds	0.00	303,820.00	2,863,849.00
20. Small compounds	0.00	5,000.00	946,080.00
21. Capital/savings	0.00	0.00	320,907.00
22. Cooperatives	0.00	0.00	343,564.00
23. Weekly market	0.00	0.00	4,952,694.00
24. Other Senegal	0.00	0.00	1,842,875.00
25. Totals	625,000.00	4,100,920.00	0.00

TABLE 2

Social Accounting Matrix, Keur Magaye
(amounts in CFA)

	1. PEANUTS	2. MILLET	3. OTHER CROPS	4. ANIMALS	5. SERVICE	6. COMMERCE
1. Peanuts	649,977.00	0.00	0.00	0.00	0.00	0.00
2. Millet	0.00	33,264.00	0.00	0.00	0.00	0.00
3. Other crops	0.00	0.00	3,355.00	0.00	0.00	0.00
4. Animals	375,000.00	187,000.00	25,000.00	0.00	0.00	0.00
5. Service	0.00	0.00	0.00	0.00	0.00	0.00
6. Commerce	0.00	0.00	0.00	0.00	0.00	0.00
7. Manager labor	375,875.00	261,962.50	43,100.00	0.00	0.00	0.00
8. Household labor	577,200.00	363,812.50	17,062.50	0.00	0.00	0.00
9. Compound labor	238,250.00	90,387.50	3,675.00	0.00	0.00	0.00
10. Village labor	38,000.00	26,437.50	3,125.00	81,000.00	0.00	0.00
11. Imported labor	119,625.00	72,500.00	1,250.00	0.00	0.00	0.00
12. Nonag. labor	0.00	0.00	0.00	192,225.00	428,000.00	197,500.00
13. Secure fields	3,905,762.00	1,957,462.00	362,462.00	0.00	0.00	0.00
14. Moderately secure	1,398,363.00	23,137.50	131,425.00	0.00	0.00	0.00
15. Insecure fields	1,990,626.00	190,075.00	226,000.00	0.00	0.00	0.00
16. Borrowed fields	1,438,675.00	-43,775.00	73,525.00	0.00	0.00	0.00
17. Grazing rights	0.00	0.00	0.00	313,775.00	0.00	0.00
18. Large compounds	8,031.00	250.00	1,120.00	0.00	0.00	200,000.00
19. Medium compounds	8,030.00	249.00	1,120.00	0.00	0.00	100,000.00
20. Small compounds	8,030.00	249.00	1,120.00	0.00	0.00	50,000.00
21. Capital/savings	0.00	0.00	0.00	0.00	0.00	0.00
22. Cooperatives	1,418,513.00	47,367.00	0.00	0.00	0.00	0.00
23. Weekly market	108,743.00	1,821.50	5,360.50	0.00	162,000.00	125,000.00
24. Other Senegal	0.00	0.00	0.00	0.00	0.00	0.00
25. Totals	12,659,700.00	3,212,200.00	898,700.00	587,000.00	590,000.00	672,500.00

[continued]

[Table 2, Social Accounting Matrix, Keur Magaye, cont.]

	7. MANAGER LABOR	8. HOUSEHOLD LABOR	9. COMPOUND LABOR	10. VILLAGE LABOR	11. IMPORTED LABOR	12. NONAG. LABOR
1. Peanuts	0.00	0.00	0.00	0.00	0.00	0.00
2. Millet	0.00	0.00	0.00	0.00	0.00	0.00
3. Other crops	0.00	0.00	0.00	0.00	0.00	0.00
4. Animals	0.00	0.00	0.00	0.00	0.00	0.00
5. Service	0.00	0.00	0.00	0.00	0.00	0.00
6. Commerce	0.00	0.00	0.00	0.00	0.00	0.00
7. Manager labor	0.00	0.00	0.00	0.00	0.00	0.00
8. Household labor	0.00	0.00	0.00	0.00	0.00	0.00
9. Compound labor	0.00	0.00	0.00	0.00	0.00	0.00
10. Village labor	0.00	0.00	0.00	0.00	0.00	0.00
11. Imported labor	0.00	0.00	0.00	0.00	0.00	0.00
12. Nonag. labor	0.00	0.00	0.00	0.00	0.00	0.00
13. Secure fields	0.00	0.00	0.00	0.00	0.00	0.00
14. Moderately secure	0.00	0.00	0.00	0.00	0.00	0.00
15. Insecure fields	0.00	0.00	0.00	0.00	0.00	0.00
16. Borrowed fields	0.00	0.00	0.00	0.00	0.00	0.00
17. Grazing rights	0.00	0.00	0.00	0.00	0.00	0.00
18. Large compounds	259,437.50	423,887.50	193,250.00	89,375.00	0.00	99,625.00
19. Medium compounds	205,125.00	270,812.50	116,312.50	19,250.00	0.00	354,350.00
20. Small compounds	217,375.00	263,375.00	22,750.00	39,937.50	0.00	363,750.00
21. Capital/savings	0.00	0.00	0.00	0.00	0.00	0.00
22. Cooperatives	0.00	0.00	0.00	0.00	0.00	0.00
23. Weekly market	0.00	0.00	0.00	0.00	0.00	0.00
24. Other Senegal	0.00	0.00	0.00	0.00	193,375.00	0.00
25. Totals	681,937.50	958,075.00	332,312.50	148,562.50	193,375.00	817,725.00

[continued]

[Table 2, Social Accounting Matrix, Keur Magaye, cont.]

	13. SECURE FIELDS	14. MODERATELY SECURE	15. INSECURE FIELDS	16. BORROWED FIELDS	17. GRAZING RIGHTS
1. Peanuts	0.00	0.00	0.00	0.00	0.00
2. Millet	0.00	0.00	0.00	0.00	0.00
3. Other crops	0.00	0.00	0.00	0.00	0.00
4. Animals	0.00	0.00	0.00	0.00	0.00
5. Service	0.00	0.00	0.00	0.00	0.00
6. Commerce	0.00	0.00	0.00	0.00	0.00
7. Manager labor	0.00	0.00	0.00	0.00	0.00
8. Household labor	0.00	0.00	0.00	0.00	0.00
9. Compound labor	0.00	0.00	0.00	0.00	0.00
10. Village labor	0.00	0.00	0.00	0.00	0.00
11. Imported labor	0.00	0.00	0.00	0.00	0.00
12. Nonag. labor	0.00	0.00	0.00	0.00	0.00
13. Secure fields	0.00	0.00	0.00	0.00	0.00
14. Moderately secure	0.00	0.00	0.00	0.00	0.00
15. Insecure fields	0.00	0.00	0.00	0.00	0.00
16. Borrowed fields	0.00	0.00	0.00	0.00	0.00
17. Grazing rights	0.00	0.00	0.00	0.00	0.00
18. Large compounds	2,666,325.00	1,328,838.00	1,188,963.00	656,300.00	125,510.00
19. Medium compounds	2,396,875.00	15,137.50	1,022,238.00	260,800.00	109,821.00
20. Small compounds	162,486.00	208,950.00	195,500.00	551,325.00	78,444.00
21. Capital/savings	0.00	0.00	0.00	0.00	0.00
22. Cooperatives	0.00	0.00	0.00	0.00	0.00
23. Weekly market	0.00	0.00	0.00	0.00	0.00
24. Other Senegal	0.00	0.00	0.00	0.00	0.00
25. Totals	6,225,666.00	1,552,925.50	2,406,701.00	1,468,425.00	313,775.00

[continued]

[Table 2, Social Accounting Matrix, Keur Magaye, cont.]

	18. LARGE COMPOUNDS	19. MEDIUM COMPOUNDS	20. SMALL COMPOUNDS	21. INVESTMENT	22. COOPERATIVES
1. Peanuts	231,219.00	62,128.00	5,508.00	94,372.00	8,480,042.00
2. Millet	925,126.00	1,622,040.00	588,050.00	2,199.00	0.00
3. Other crops	298,660.00	94,935.00	60,600.00	17,145.00	0.00
4. Animals	0.00	0.00	0.00	0.00	0.00
5. Service	289,100.00	182,900.00	118,000.00	0.00	0.00
6. Commerce	79,625.00	50,375.00	32,500.00	0.00	0.00
7. Manager labor	0.00	0.00	0.00	0.00	0.00
8. Household labor	0.00	0.00	0.00	0.00	0.00
9. Compound labor	0.00	0.00	0.00	0.00	0.00
10. Village labor	0.00	0.00	0.00	0.00	0.00
11. Imported labor	0.00	0.00	0.00	0.00	0.00
12. Nonag. labor	0.00	0.00	0.00	0.00	0.00
13. Secure fields	0.00	0.00	0.00	0.00	0.00
14. Moderately secure	0.00	0.00	0.00	0.00	0.00
15. Insecure fields	0.00	0.00	0.00	0.00	0.00
16. Borrowed fields	0.00	0.00	0.00	0.00	0.00
17. Grazing rights	0.00	0.00	0.00	0.00	0.00
18. Large compounds	0.00	0.00	0.00	0.00	0.00
19. Medium compounds	0.00	0.00	0.00	0.00	0.00
20. Small compounds	0.00	0.00	0.00	0.00	0.00
21. Capital/savings	296,093.00	103,860.00	272,958.00	0.00	0.00
22. Cooperatives	0.00	0.00	0.00	15,000.00	0.00
23. Weekly market	5,576,589.00	2,824,882.50	2,104,473.50	374,195.00	0.00
24. Other Senegal	0.00	4,000.00	0.00	170,000.00	0.00
25. Totals	7,696,412.00	4,945,120.50	3,182,089.50	672,911.00	8,480,042.00

[continued]

[Table 2, Social Accounting Matrix, Keur Magaye, cont.]

	23. WEEKLY MARKET	24. OTHER SENEGAL	25. TOTALS
1. Peanuts	0.00	3,136,454.00	12,659,700.00
2. Millet	23,252.00	18,269.00	3,212,200.00
3. Other crops	170,502.00	253,503.00	898,700.00
4. Animals	0.00	0.00	587,000.00
5. Service	0.00	0.00	590,000.00
6. Commerce	510,000.00	0.00	672,500.00
7. Manager labor	0.00	0.00	681,937.50
8. Household labor	0.00	0.00	958,075.00
9. Compound labor	0.00	0.00	332,312.50
10. Village labor	0.00	0.00	148,562.50
11. Imported labor	0.00	0.00	193,375.00
12. Nonag. labor	0.00	0.00	817,725.00
13. Secure fields	0.00	0.00	6,225,686.00
14. Moderately secure	0.00	0.00	1,552,925.50
15. Insecure fields	0.00	0.00	2,406,701.00
16. Borrowed fields	0.00	0.00	1,468,425.00
17. Grazing rights	0.00	0.00	313,775.00
18. Large compounds	0.00	455,500.00	7,696,412.00
19. Medium compounds	0.00	65,000.00	4,945,120.50
20. Small compounds	0.00	18,800.00	3,182,089.50
21. Capital/savings	0.00	0.00	672,911.00
22. Cooperatives	0.00	0.00	1,480,880.00
23. Weekly market	0.00	0.00	11,283,067.00
24. Other Senegal	0.00	0.00	367,375.00
25. Totals	703,754.00	3,947,526.00	0.00

TABLE 3

Normalized Social Accounting Matrix, Keur Marie
(amounts in CFA)

	1. PEANUTS	2. MILLET	3. OTHER CROPS	4. ANIMALS	5. SERVICE	6. COMMERCE
1. Peanuts	0.076	0	0	0	0	0
2. Millet	0	0.009	0	0	0	0
3. Other crops	0	0	0.012	0	0	0.018
4. Animals	0.074	0.076	0.085	0	0	0
5. Service	0	0	0	0	0	0
6. Commerce	0	0	0	0	0	0
7. Manager labor	0.036	0.095	0.108	0	0	0
8. Household labor	0.09	0.159	0.087	0	0	0
9. Compound labor	0.028	0.028	0.077	0	0	0
10. Village labor	0.011	0.035	0.011	0.026	0	0
11. Imported labor	0.002	0.004	0.001	0	0	0
12. Nonag. labor	0	0	0	0.864	0.996	0.131
13. Secure fields	0.275	0.499	0.119	0	0	0
14. Moderately secure	0.041	0.011	0.273	0	0	0
15. Insecure fields	0.118	0.004	0.24	0	0	0
16. Borrowed fields	0.1	0.078	-0.035	0	0	0
17. Grazing rights	0	0	0	0.109	0	0
18. Large compounds	0.007	0	0	0	0	0
19. Medium compounds	0.007	0	0	0	0	0
20. Small compounds	0.007	0	0	0	0	0
21. Capital/savings	0	0	0	0	0	0
22. Cooperatives	0.117	0	0	0	0	0
23. Weekly market	0.014	0.001	0.018	0	0.004	0.087
24. Other Senegal	0	0	0.004	0	0	0.764

[continued]

1980-81
 1981-82
 1982-83
 1983-84
 1984-85
 1985-86
 1986-87
 1987-88
 1988-89
 1989-90
 1990-91
 1991-92
 1992-93
 1993-94
 1994-95
 1995-96
 1996-97
 1997-98
 1998-99
 1999-00
 2000-01
 2001-02
 2002-03
 2003-04
 2004-05
 2005-06
 2006-07
 2007-08
 2008-09
 2009-10
 2010-11
 2011-12
 2012-13
 2013-14
 2014-15
 2015-16
 2016-17
 2017-18
 2018-19
 2019-20
 2020-21
 2021-22
 2022-23
 2023-24
 2024-25
 2025-26
 2026-27
 2027-28
 2028-29
 2029-30
 2030-31
 2031-32
 2032-33
 2033-34
 2034-35
 2035-36
 2036-37
 2037-38
 2038-39
 2039-40
 2040-41
 2041-42
 2042-43
 2043-44
 2044-45
 2045-46
 2046-47
 2047-48
 2048-49
 2049-50
 2050-51
 2051-52
 2052-53
 2053-54
 2054-55
 2055-56
 2056-57
 2057-58
 2058-59
 2059-60
 2060-61
 2061-62
 2062-63
 2063-64
 2064-65
 2065-66
 2066-67
 2067-68
 2068-69
 2069-70
 2070-71
 2071-72
 2072-73
 2073-74
 2074-75
 2075-76
 2076-77
 2077-78
 2078-79
 2079-80
 2080-81
 2081-82
 2082-83
 2083-84
 2084-85
 2085-86
 2086-87
 2087-88
 2088-89
 2089-90
 2090-91
 2091-92
 2092-93
 2093-94
 2094-95
 2095-96
 2096-97
 2097-98
 2098-99
 2099-00
 2100-01
 2101-02
 2102-03
 2103-04
 2104-05
 2105-06
 2106-07
 2107-08
 2108-09
 2109-10
 2110-11
 2111-12
 2112-13
 2113-14
 2114-15
 2115-16
 2116-17
 2117-18
 2118-19
 2119-20
 2120-21
 2121-22
 2122-23
 2123-24
 2124-25
 2125-26
 2126-27
 2127-28
 2128-29
 2129-30
 2130-31
 2131-32
 2132-33
 2133-34
 2134-35
 2135-36
 2136-37
 2137-38
 2138-39
 2139-40
 2140-41
 2141-42
 2142-43
 2143-44
 2144-45
 2145-46
 2146-47
 2147-48
 2148-49
 2149-50
 2150-51
 2151-52
 2152-53
 2153-54
 2154-55
 2155-56
 2156-57
 2157-58
 2158-59
 2159-60
 2160-61
 2161-62
 2162-63
 2163-64
 2164-65
 2165-66
 2166-67
 2167-68
 2168-69
 2169-70
 2170-71
 2171-72
 2172-73
 2173-74
 2174-75
 2175-76
 2176-77
 2177-78
 2178-79
 2179-80
 2180-81
 2181-82
 2182-83
 2183-84
 2184-85
 2185-86
 2186-87
 2187-88
 2188-89
 2189-90
 2190-91
 2191-92
 2192-93
 2193-94
 2194-95
 2195-96
 2196-97
 2197-98
 2198-99
 2199-00
 2200-01
 2201-02
 2202-03
 2203-04
 2204-05
 2205-06
 2206-07
 2207-08
 2208-09
 2209-10
 2210-11
 2211-12
 2212-13
 2213-14
 2214-15
 2215-16
 2216-17
 2217-18
 2218-19
 2219-20
 2220-21
 2221-22
 2222-23
 2223-24
 2224-25
 2225-26
 2226-27
 2227-28
 2228-29
 2229-30
 2230-31
 2231-32
 2232-33
 2233-34
 2234-35
 2235-36
 2236-37
 2237-38
 2238-39
 2239-40
 2240-41
 2241-42
 2242-43
 2243-44
 2244-45
 2245-46
 2246-47
 2247-48
 2248-49
 2249-50
 2250-51
 2251-52
 2252-53
 2253-54
 2254-55
 2255-56
 2256-57
 2257-58
 2258-59
 2259-60
 2260-61
 2261-62
 2262-63
 2263-64
 2264-65
 2265-66
 2266-67
 2267-68
 2268-69
 2269-70
 2270-71
 2271-72
 2272-73
 2273-74
 2274-75
 2275-76
 2276-77
 2277-78
 2278-79
 2279-80
 2280-81
 2281-82
 2282-83
 2283-84
 2284-85
 2285-86
 2286-87
 2287-88
 2288-89
 2289-90
 2290-91
 2291-92
 2292-93
 2293-94
 2294-95
 2295-96
 2296-97
 2297-98
 2298-99
 2299-00
 2300-01
 2301-02
 2302-03
 2303-04
 2304-05
 2305-06
 2306-07
 2307-08
 2308-09
 2309-10
 2310-11
 2311-12
 2312-13
 2313-14
 2314-15
 2315-16
 2316-17
 2317-18
 2318-19
 2319-20
 2320-21
 2321-22
 2322-23
 2323-24
 2324-25
 2325-26
 2326-27
 2327-28
 2328-29
 2329-30
 2330-31
 2331-32
 2332-33
 2333-34
 2334-35
 2335-36
 2336-37
 2337-38
 2338-39
 2339-40
 2340-41
 2341-42
 2342-43
 2343-44
 2344-45
 2345-46
 2346-47
 2347-48
 2348-49
 2349-50
 2350-51
 2351-52
 2352-53
 2353-54
 2354-55
 2355-56
 2356-57
 2357-58
 2358-59
 2359-60
 2360-61
 2361-62
 2362-63
 2363-64
 2364-65
 2365-66
 2366-67
 2367-68
 2368-69
 2369-70
 2370-71
 2371-72
 2372-73
 2373-74
 2374-75
 2375-76
 2376-77
 2377-78
 2378-79
 2379-80
 2380-81
 2381-82
 2382-83
 2383-84
 2384-85
 2385-86
 2386-87
 2387-88
 2388-89
 2389-90
 2390-91
 2391-92
 2392-93
 2393-94
 2394-95
 2395-96
 2396-97
 2397-98
 2398-99
 2399-00
 2400-01
 2401-02
 2402-03
 2403-04
 2404-05
 2405-06
 2406-07
 2407-08
 2408-09
 2409-10
 2410-11
 2411-12
 2412-13
 2413-14
 2414-15
 2415-16
 2416-17
 2417-18
 2418-19
 2419-20
 2420-21
 2421-22
 2422-23
 2423-24
 2424-25
 2425-26
 2426-27
 2427-28
 2428-29
 2429-30
 2430-31
 2431-32
 2432-33
 2433-34
 2434-35
 2435-36
 2436-37
 2437-38
 2438-39
 2439-40
 2440-41
 2441-42
 2442-43
 2443-44
 2444-45
 2445-46
 2446-47
 2447-48
 2448-49
 2449-50
 2450-51
 2451-52
 2452-53
 2453-54
 2454-55
 2455-56
 2456-57
 2457-58
 2458-59
 2459-60
 2460-61
 2461-62
 2462-63
 2463-64
 2464-65
 2465-66
 2466-67
 2467-68
 2468-69
 2469-70
 2470-71
 2471-72
 2472-73
 2473-74
 2474-75
 2475-76
 2476-77
 2477-78
 2478-79
 2479-80
 2480-81
 2481-82
 2482-83
 2483-84
 2484-85
 2485-86
 2486-87
 2487-88
 2488-89
 2489-90
 2490-91
 2491-92
 2492-93
 2493-94
 2494-95
 2495-96
 2496-97
 2497-98
 2498-99
 2499-00
 2500-01
 2501-02
 2502-03
 2503-04
 2504-05
 2505-06
 2506-07
 2507-08
 2508-09
 2509-10
 2510-11
 2511-12
 2512-13
 2513-14
 2514-15
 2515-16
 2516-17
 2517-18
 2518-19
 2519-20
 2520-21
 2521-22
 2522-23
 2523-24
 2524-25
 2525-26
 2526-27
 2527-28
 2528-29
 2529-30
 2530-31
 2531-32
 2532-33
 2533-34
 2534-35
 2535-36
 2536-37
 2537-38
 2538-39
 2539-40
 2540-41
 2541-42
 2542-43
 2543-44
 2544-45
 2545-46
 2546-47
 2547-48
 2548-49
 2549-50
 2550-51
 2551-52
 2552-53
 2553-54
 2554-55
 2555-56
 2556-57
 2557-58
 2558-59
 2559-60
 2560-61
 2561-62
 2562-63
 2563-64
 2564-65
 2565-66
 2566-67
 2567-68
 2568-69
 2569-70
 2570-71
 2571-72
 2572-73
 2573-74
 2574-75
 2575-76
 2576-77
 2577-78
 2578-79
 2579-80
 2580-81
 2581-82
 2582-83
 2583-84
 2584-85
 2585-86
 2586-87
 2587-88
 2588-89
 2589-90
 2590-91
 2591-92
 2592-93
 2593-94
 2594-95
 2595-96
 2596-97
 2597-98
 2598-99
 2599-00
 2600-01
 2601-02
 2602-03
 2603-04
 2604-05
 2605-06
 2606-07
 2607-08
 2608-09
 2609-10
 2610-11
 2611-12
 2612-13
 2613-14
 2614-15
 2615-16
 2616-17
 2617-18
 2618-19
 2619-20
 2620-21
 2621-22
 2622-23
 2623-24
 2624-25
 2625-26
 2626-27
 2627-28
 2628-29
 2629-30
 2630-31
 2631-32
 2632-33
 2633-34
 2634-35
 2635-36
 2636-37
 2637-38
 2638-39
 2639-40
 2640-41
 2641-42
 2642-43
 2643-44
 2644-45
 2645-46
 2646-47
 2647-48
 2648-49
 2649-50
 2650-51
 2651-52
 2652-53
 2653-54
 2654-55
 2655-56
 2656-57
 2657-58
 2658-59
 2659-60
 2660-61
 2661-62
 2662-63
 2663-64
 2664-65
 2665-66
 2666-67
 2667-68
 2668-69
 2669-70
 2670-71
 2671-72
 2672-73
 2673-74
 2674-75
 2675-76
 2676-77
 2677-78
 2678-79
 2679-80
 2680-81
 2681-82
 2682-83
 2683-84
 2684-85
 2685-86
 2686-87
 2687-88
 2688-89
 2689-90
 2690-91
 2691-92
 2692-93
 2693-94
 2694-95
 2695-96
 2696-97
 2697-98
 2698-99
 2699-00
 2700-01
 2701-02
 2702-03
 2703-04
 2704-05
 2705-06
 2706-07
 2707-08
 2708-09
 2709-10
 2710-11
 2711-12
 2712-13
 2713-14
 2714-15
 2715-16
 2716-17
 2717-18
 2718-19
 2719-20
 2720-21
 2721-22
 2722-23
 2723-24
 2724-25
 2725-26
 2726-27
 2727-28
 2728-29
 2729-30
 2730-31
 2731-32
 2732-33
 2733-34
 2734-35
 2735-36
 2736-37
 2737-38
 2738-39
 2739-40
 2740-41
 2741-42
 2742-43
 2743-44
 2744-45
 2745-46
 2746-47
 2747-48
 2748-49
 2749-50
 2750-51
 2751-52
 2752-53
 2753-54
 2754-55
 2755-56
 2756-57
 2757-58
 2758-59
 2759-60
 2760-61
 2761-62
 2762-63
 2763-64
 2764-65
 2765-66
 2766-67
 2767-68
 2768-69
 2769-70
 2770-71
 2771-72
 2772-73
 2773-74
 2774-75
 2775-76
 2776-77
 2777-78
 2778-79
 2779-80
 2780-81
 2781-82
 2782-83
 2783-84
 2784-85
 2785-86
 2786-87
 2787-88
 2788-89
 2789-90
 2790-91
 2791-92
 2792-93
 2793-94
 2794-95
 2795-96
 2796-97
 2797-98
 2798-99
 2799-00
 2800-01
 2801-02
 2802-03
 2803-04
 2804-05
 2805-06
 2806-07
 2807-08
 2808-09
 2809-10
 2810-11
 2811-12
 2812-13
 2813-14
 2814-15
 2815-16
 2816-17
 2817-18
 2818-19
 2819-20
 2820-21
 2821-22
 2822-23
 2823-24
 2824-25
 2825-26
 2826-27
 2827-28
 2828-29
 2829-30
 2830-31
 2831-32
 2832-33
 2833-34
 2834-35
 2835-36
 2836-37
 2837-38
 2838-39
 2839-40
 2840-41
 2841-42
 2842-43
 2843-44
 2844-45
 2845-46
 2846-47
 2847-48
 2848-49
 2849-50
 2850-51

[Table 3, Normalized Matrix, Keur Marie]

	7. MANAGER LABOR	8. HOUSEHOLD LABOR	9. COMPOUND LABOR	10. VILLAGE LABOR	11. IMPORTED LABOR	12. NONAG. LABOR
1. Peanuts	0	0	0	0	0	0
2. Millet	0	0	0	0	0	0
3. Other crops	0	0	0	0	0	0
4. Animals	0	0	0	0	0	0
5. Service	0	0	0	0	0	0
6. Commerce	0	0	0	0	0	0
7. Manager labor	0	0	0	0	0	0
8. Household labor	0	0	0	0	0	0
9. Compound labor	0	0	0	0	0	0
10. Village labor	0	0	0	0	0	0
11. Imported labor	0	0	0	0	0	0
12. Nonag. labor	0	0	0	0	0	0
13. Secure fields	0	0	0	0	0	0
14. Moderately secure	0	0	0	0	0	0
15. Insecure fields	0	0	0	0	0	0
16. Borrowed fields	0	0	0	0	0	0
17. Grazing rights	0	0	0	0	0	0
18. Large compounds	0.27	0.456	0.301	0.317	0	0.228
19. Medium compounds	0.419	0.302	0.691	0.384	0	0.547
20. Small compounds	0.312	0.242	0.008	0.3	0	0.225
21. Capital/savings	0	0	0	0	0	0
22. Cooperatives	0	0	0	0	0	0
23. Weekly market	0	0	0	0	0	0
24. Other Senegal	0	0	0	0	1	0

[continued]

[Table 3, Normalized Matrix, Keur Marie]

	13. SECURE FIELDS	14. MODERATELY FIELDS	15. INSECURE FIELDS	16. BORROWED FIELDS	17. GRAZING RIGHTS
1. Peanuts	0	0	0	0	0
2. Millet	0	0	0	0	0
3. Other crops	0	0	0	0	0
4. Animals	0	0	0	0	0
5. Service	0	0	0	0	0
6. Commerce	0	0	0	0	0
7. Manager labor	0	0	0	0	0
8. Household labor	0	0	0	0	0
9. Compound labor	0	0	0	0	0
10. Village labor	0	0	0	0	0
11. Imported labor	0	0	0	0	0
12. Nonag. labor	0	0	0	0	0
13. Secure fields	0	0	0	0	0
14. Moderately secure	0	0	0	0	0
15. Insecure fields	0	0	0	0	0
16. Borrowed fields	0	0	0	0	0
17. Grazing rights	0	0	0	0	0
18. Large compounds	0.442	0.784	0.271	0.492	0.5
19. Medium compounds	0.464	0.216	0.729	0.181	0.35
20. Small compounds	0.094	0	0	0.327	0.15
21. Capital/savings	0	0	0	0	0
22. Cooperatives	0	0	0	0	0
23. Weekly market	0	0	0	0	0
24. Other Senegal	0	0	0	0	0

[continued]

[Table 3, Normalized Matrix, Keur Marie]

	18. LARGE COMPOUNDS	19. MEDIUM COMPOUNDS	20. SMALL COMPOUNDS	21. INVESTMENT	22. COOPERATIVES
1. Peanuts	0.023	0.028	0.004	0.353	1
2. Millet	0.231	0.382	0.692	0	0
3. Other crops	0.017	0.01	0.027	0	0
4. Animals	0	0	0	0	0
5. Service	0.015	0.015	0.015	0	0
6. Commerce	0.034	0.034	0.034	0	0
7. Manager labor	0	0	0	0	0
8. Household labor	0	0	0	0	0
9. Compound labor	0	0	0	0	0
10. Village labor	0	0	0	0	0
11. Imported labor	0	0	0	0	0
12. Nonag. labor	0	0	0	0	0
13. Secure fields	0	0	0	0	0
14. Moderately secure	0	0	0	0	0
15. Insecure fields	0	0	0	0	0
16. Borrowed fields	0	0	0	0	0
17. Grazing rights	0	0	0	0	0
18. Large compounds	0	0	0	0	0
19. Medium compounds	0	0	0	0	0
20. Small compounds	0	0	0	0	0
21. Capital/savings	0.041	0.04	0.014	0	0
22. Cooperatives	0	0	0	0	0
23. Weekly market	0.639	0.491	0.215	0.335	0
24. Other Senegal	0	0	0	0.312	0

[continued]

[Table 3, Normalized Matrix, Keur Marie]

	23. WEEKLY MARKET	24. OTHER SENEGAL
1. Peanuts	0	0
2. Millet	0	0
3. Other crops	0	0.021
4. Animals	0	0
5. Service	0	0
6. Commerce	1	0.328
7. Manager labor	0	0
8. Household labor	0	0
9. Compound labor	0	0
10. Village labor	0	0
11. Imported labor	0	0
12. Nonag. labor	0	0
13. Secure fields	0	0
14. Moderately secure	0	0
15. Insecure fields	0	0
16. Borrowed fields	0	0
17. Grazing rights	0	0
18. Large compounds	0	0.576
19. Medium compounds	0	0.074
20. Small compounds	0	0.001
21. Capital/savings	0	0
22. Cooperatives	0	0
23. Weekly market	0	0
24. Other Senegal	0	0

TABLE 4

Normalized Social Accounting Matrix, Keur Magaye
(amounts in CFA)

	1. PEANUTS	2. MILLET	3. OTHER CROPS	4. ANIMALS	5. SERVICE	6. COMMERCE
1. Peanuts	0.051	0	0	0	0	0
2. Millet	0	0.01	0	0	0	0
3. Other crops	0	0	0.004	0	0	0
4. Animals	0.03	0.058	0.028	0	0	0
5. Service	0	0	0	0	0	0
6. Commerce	0	0	0	0	0	0
7. Manager labor	0.03	0.082	0.048	0	0	0
8. Household labor	0.046	0.113	0.019	0	0	0
9. Compound labor	0.019	0.028	0.004	0	0	0
10. Village labor	0.003	0.008	0.003	0.138	0	0
11. Imported labor	0.009	0.023	0.001	0	0	0
12. Nonag. labor	0	0	0	0.327	0.725	0.294
13. Secure fields	0.309	0.609	0.403	0	0	0
14. Moderately secure	0.11	0.007	0.146	0	0	0
15. Insecure fields	0.157	0.059	0.251	0	0	0
16. Borrowed fields	0.114	-0.014	0.082	0	0	0
17. Grazing rights	0	0	0	0.535	0	0
18. Large compounds	0.001	0	0.001	0	0	0.297
19. Medium compounds	0.001	0	0.001	0	0	0.149
20. Small compounds	0.001	0	0.001	0	0	0.074
21. Capital/savings	0	0	0	0	0	0
22. Cooperatives	0.112	0.015	0	0	0	0
23. Weekly market	0.009	0.001	0.006	0	0.275	0.186
24. Other Senegal	0	0	0	0	0	0

[continued]

[Table 4, Normalized Matrix, Keur Magaye]

	7. MANAGER LABOR	8. HOUSEHOLD LABOR	9. COMPOUND LABOR	10. VILLAGE LABOR	11. IMPORTED LABOR	12. NONAG. LABOR
1. Peanuts	0	0	0	0	0	0
2. Millet	0	0	0	0	0	0
3. Other crops	0	0	0	0	0	0
4. Animals	0	0	0	0	0	0
5. Service	0	0	0	0	0	0
6. Commerce	0	0	0	0	0	0
7. Manager labor	0	0	0	0	0	0
8. Household labor	0	0	0	0	0	0
9. Compound labor	0	0	0	0	0	0
10. Village labor	0	0	0	0	0	0
11. Imported labor	0	0	0	0	0	0
12. Nonag. labor	0	0	0	0	0	0
13. Secure fields	0	0	0	0	0	0
14. Moderately secure	0	0	0	0	0	0
15. Insecure fields	0	0	0	0	0	0
16. Borrowed fields	0	0	0	0	0	0
17. Grazing rights	0	0	0	0	0	0
18. Large compounds	0.38	0.442	0.582	0.602	0	0.122
19. Medium compounds	0.301	0.283	0.35	0.13	0	0.433
20. Small compounds	0.319	0.275	0.068	0.269	0	0.445
21. Capital/savings	0	0	0	0	0	0
22. Cooperatives	0	0	0	0	0	0
23. Weekly market	0	0	0	0	0	0
24. Other Senegal	0	0	0	0	1	0

[continued]

[Table 4, Normalized Matrix, Keur Magaye]

	13. SECURE FIELDS	14. MODERATELY FIELDS	15. INSECURE FIELDS	16. BORROWED FIELDS	17. GRAZING RIGHTS
1. Peanuts	0	0	0	0	0
2. Millet	0	0	0	0	0
3. Other crops	0	0	0	0	0
4. Animals	0	0	0	0	0
5. Service	0	0	0	0	0
6. Commerce	0	0	0	0	0
7. Manager labor	0	0	0	0	0
8. Household labor	0	0	0	0	0
9. Compound labor	0	0	0	0	0
10. Village labor	0	0	0	0	0
11. Imported labor	0	0	0	0	0
12. Nonag. labor	0	0	0	0	0
13. Secure fields	0	0	0	0	0
14. Moderately secure	0	0	0	0	0
15. Insecure fields	0	0	0	0	0
16. Borrowed fields	0	0	0	0	0
17. Grazing rights	0	0	0	0	0
18. Large compounds	0.428	0.856	0.494	0.447	0.4
19. Medium compounds	0.385	0.01	0.425	0.178	0.35
20. Small compounds	0.187	0.135	0.081	0.375	0.25
21. Capital/savings	0	0	0	0	0
22. Cooperatives	0	0	0	0	0
23. Weekly market	0	0	0	0	0
24. Other Senegal	0	0	0	0	0

[continued]

[Table 4, Normalized Matrix, Keur Bagaye]

	18. LARGE COMPOUNDS	19. MEDIUM COMPOUNDS	20. SMALL COMPOUNDS	21. INVESTMENT	22. COOPERATIVES
1. Peanuts	0.03	0.013	0.002	0.14	1
2. Millet	0.12	0.328	0.185	0.003	0
3. Other crops	0.039	0.019	0.019	0.025	0
4. Animals	0	0	0	0	0
5. Service	0.038	0.037	0.037	0	0
6. Commerce	0.01	0.01	0.01	0	0
7. Manager labor	0	0	0	0	0
8. Household labor	0	0	0	0	0
9. Compound labor	0	0	0	0	0
10. Village labor	0	0	0	0	0
11. Imported labor	0	0	0	0	0
12. Nonag. labor	0	0	0	0	0
13. Secure fields	0	0	0	0	0
14. Moderately secure	0	0	0	0	0
15. Insecure fields	0	0	0	0	0
16. Borrowed fields	0	0	0	0	0
17. Grazing rights	0	0	0	0	0
18. Large compounds	0	0	0	0	0
19. Medium compounds	0	0	0	0	0
20. Small compounds	0	0	0	0	0
21. Capital/savings	0.038	0.021	0.086	0	0
22. Cooperatives	0	0	0	0.022	0
23. Weekly market	0.725	0.571	0.661	0.556	0
24. Other Senegal	0	0.001	0	0.253	0

[continued]

[Table 4, Normalized Matrix, Keur Magaye]

	23. WEEKLY MARKET	24. OTHER SENEGAL
1. Peanuts	0	0.795
2. Millet	0.033	0.005
3. Other crops	0.242	0.064
4. Animals	0	0
5. Service	0	0
6. Commerce	0.725	0
7. Manager labor	0	0
8. Household labor	0	0
9. Compound labor	0	0
10. Village labor	0	0
11. Imported labor	0	0
12. Nonag. labor	0	0
13. Secure fields	0	0
14. Moderately secure	0	0
15. Insecure fields	0	0
16. Borrowed fields	0	0
17. Grazing rights	0	0
18. Large compounds	0	0.115
19. Medium compounds	0	0.016
20. Small compounds	0	0.005
21. Capital/savings	0	0
22. Cooperatives	0	0
23. Weekly market	0	0
24. Other Senegal	0	0

APPENDIX FOUR

DESCRIPTION OF EACH BLOCK OF ACTIVITY
IN THE SOCIAL ACCOUNTING MATRICES

Previous Page Blank

APPENDIX FOUR

In the outline of the village SAMs presented in Diagram 1, block 1 is the village input-output table. This block records the amount of peanut, millet, or other crop seed that was retained from the previous year's harvest (1985) and planted in 1986, plus the amount of animal services used in the production of the 1986 crops or in service or commercial activities. The input-output tables for the two villages are relatively empty, with inputs to farm activities restricted to retained seeds, animal services, and petty commerce. The retained seed amount listed here is that amount retained by each compound for its own use. Seeds or other inputs that are purchased from other compounds in the village are enumerated in block 3. Percentage breakdowns of the amount of seed that village compounds retained for their own use are given below in Table 1.

In both villages, the fact that peanut seeds are supplied by the government on credit is mirrored in the small amount retained by the compounds from one year to the next. On the other hand, almost all of the compounds' millet-seed needs are met by retained stocks. The big difference in retained percentages between the two crops may also reflect the fact that peanut-seed storage can prove quite costly. Whereas on average it requires only 3 kilos of seed to plant a hectare of millet, it requires about 85 kilos of peanut seed to plant a corresponding area. Peanut seeds are also fragile: seed quality deteriorates from one year to the next, and farmers must periodically supplement retained stocks with higher quality seeds. In both villages, the largest portion of other crop "seed" is purchased, from either village neighbors, the weekly market, or elsewhere in Senegal. This reflects the fact that in Keur Magaye manioc is a booming crop, with farmers currently planting first-time cultivations. In Keur Marie, the vegetable and melon market is organized by Lebanese merchants from Dakar who supply seeds, fertilizer, and pesticide on credit.

Block 2 records factor value-added. Here, the value of land and labor services used in the production of each activity is registered. Note that because the value of land services is a residue calculation (value of crop or other activities - labor value - other input value - land value), it is not unreasonable to derive negative values for land services, as was done for other crop production on borrowed fields in Keur Marie and millet production on borrowed fields in Keur Magaye. Low harvest amounts in these fields is explained by insect damage. To examine further the structure of value added in the two villages, the normalized SAM is a better tool.

To normalize the SAMs, each entry in the matrix is divided by its column total. This results in a matrix of coefficients, the column totals of which equal one. The normalized SAMs present expenditure in percentages. The normalized SAMs are given in Tables 3 and 4 in Appendix Three.

DIAGRAM 1
SAM Outline

	I. ACTIVITIES	II. FACTORS	III. INSTITUTION	IV. SAVINGS	V. ROW
I. <u>Activities</u>					
Peanuts					
Millet	Block 1	Block 6	Block 11	Block 16	Block 21
Other crops	village	empty	village-	seed-	exports
Animals	input-output		produced	stock	from
Service	table		consumption	investment	village
Commerce					
II. <u>Factors</u>					
Manager labor					
Household labor	Block 2	Block 7	Block 12	Block 17	Block 22
Compound labor	factor	empty	empty	empty	empty
Village labor	value-added				
Imported labor					
Nonag. labor					
Secure fields					
Moderately secure					
Insecure fields					
Borrowed fields					
Grazing rights					
III. <u>Institutions</u>					
Large compounds	Block 3	Block 8	Block 13	Block 18	Block 23
Medium compounds	inputs	distribution	empty	empty	remittances
Small compounds	supplied by	of			and
	other compounds	value-added			salaries
IV. <u>Capital/Savings</u>					
	Block 4	Block 9	Block 14	Block 19	Block 24
	empty	empty	savings	empty	empty
V. <u>Rest of the World</u>					
Cooperatives	Block 5	Block 10	Block 15	Block 20	Block 25
Weekly market	imported	imported	imported	imported	empty
Other Senegal	inputs	labor	consumption	investments	

TABLE 1
Retained Seeds as Percentage of Total Seeds Planted in 1986

	KEUR MARIE	KEUR MAGAYE
Peanut seeds retained	34	31
Millet seeds retained	93	89
Other crop seeds retained	39	29

By examining column one in the two normalized SAMs, comparisons can be made between the composition of value-added in the two villages. It is observed that inputs such as seed, pesticide, and fertilizer account for approximately 23 percent of Keur Marie's value-added in peanuts and approximately 18 percent of Keur Magaye's. Labor from within the compound as a whole accounts for 15 percent of value-added in Keur Marie while village and imported labor account for 1 percent. These numbers in Keur Magaye are 9 percent and 0.9 percent, respectively. Animal services contribute 7 percent of value added in Keur Marie and 3 percent in Keur Magaye. Land services in Keur Marie contribute 53 percent, and in Keur Magaye, 69 percent. Table 2 compares these numbers to the percentages for millet and other crops in the two villages.

TABLE 2
Value-Added, Crop Comparisons
(in %)

	PEANUTS		MILLET		OTHER CROPS	
	K.Marie	K.Magaye	K.Marie	K.Magaye	K.Marie	K.Magaye
Seeds, pesticide, fertilizer	23	18	1	3	3	1
Animals	7	3	8	6	8	3
Labor	17	10	32	25	29	8
Land	53	69	59	66	60	88

For peanuts and millet, the value-added ratios are fairly similar, with the major difference found in the higher labor value-added found in Keur Marie (which implies a lower land value-added). As evidenced here, the seed, pesticide, and fertilizer input ratio is much higher for peanuts than for millet. This is in keeping with the fact that peanut seed is a relatively expensive input and that pesticide is distributed by the cooperative for use on peanut fields. Very little fertilizer was used in either peanut or millet fields. The large difference in the labor categories for other crops is explained by the fact that the primary other crop in Keur Magaye is manioc, which requires almost no work, while in Keur Marie the other crops are primarily vegetables and melon, which require even more work than is probably reflected here.

To return to explaining the SAM outline in Diagram 1: block 3 enumerates inputs such as pesticide, fertilizer, or seeds that originate with other compounds in the village. Because no one in the sample responded that they had supplied any of these inputs to neighboring compounds, these amounts were divided equally among the three compound types. In Keur Marie, these amounts correspond to 375 CFA worth of pesticide, 59,076 CFA of peanut seeds, and 125 CFA of other crop seeds. In Keur Magaye, the total is comprised of 3,125 CFA of pesticide, 20,967 CFA of peanut seed, 748 CFA of millet seed, and 3,360 CFA of other crop seed.

Block 4 is empty by design. Activities do not engage in savings.

Block 5 lists imported inputs. These include seeds, pesticide, and fertilizer for the agricultural activities, and fish, tea, condiments, and miscellaneous merchandise for the other activities. More exactly, in Keur Marie, in the peanut column, 334,764 CFA worth of seeds, 2,000 CFA of fertilizer, and 6,675 CFA of pesticide came from government-sponsored cooperatives. For millet, 125 CFA of pesticide and 2,131 CFA worth of seeds came from the cooperatives. In the other crop column, 3,760 CFA worth of seed and 1,000 CFA of fertilizer came from the weekly market and 1,000 CFA worth of seed came from other areas in Senegal. In Keur Magaye, the compounds purchased 1,341,888 CFA of seeds, 48,000 CFA of fertilizer, and 28,625 CFA of pesticide from the cooperatives. For millet, 42,000 CFA of fertilizer, 3,125 CFA worth of pesticide, and 2,242 CFA worth of seeds came from the cooperatives, and 700 CFA of pesticide and 1,121 CFA of seeds, from the weekly market. In the other crop column, the weekly market supplied 550 CFA of pesticide and 4,810 CFA of seeds.

Blocks 6 and 7 are empty, with no "payments" being made by factors to activities or to other factors.

Block 8 records the distribution of value-added across institutions. The value-added contributed by land, village labor, and animals is allocated to the compounds to which they belong. In Table 3, block 8 is rearranged to present the percentage of farm income derived from the different factors.

Table 3 shows that labor value-added percentages across labor types and compound types are comparable, with all compounds deriving most labor value-added from household, manager, compound, and village labor in descending order. But although the distribution across labor types is similar, small compounds derived almost twice the value-added from labor that medium or large compounds did. This means that relative to the income gained, small compounds expended

TABLE 3
Factor Value-Added as Percentage of Farm Income

	LARGE COMPOUNDS	MEDIUM COMPOUNDS	SMALL COMPOUNDS
Keur Marie:			
Manager labor	6	7	15.4
Household Labor	15	10	22
Compounds labor	2	6	0.2
Village labor	2	2	5
Secure fields	44	46	26
Moderately secure	8	2	0
Insecure fields	5	14	0
Borrowed fields	11	4	20
Animals	7	9	11
Keur Magaye:			
Manager labor	3.4	5	13
Household labor	6	6	15
Compound labor	3	2	1
Village labor	0.6	0.2	1
Secure fields	38	53.5	9
Moderately secure	19	0.3	12
Insecure fields	17	23	11
Borrowed fields	9	6	32
Animals	4	4	6

about twice the labor time on agriculture as large and medium compounds did. Animal use across compounds is not strikingly different across villages. Secure fields account for most of the land value-added, though in Keur Magaye the smaller compounds relied most heavily on borrowed land.

A better understanding of the land value-added numbers is achieved through calculation of the value of land services per hectare for the four categories of fields (that is, secure, moderately secure, insecure, and borrowed). First,

TABLE 4
Value of Land Services by Field Security
(in CFA)

	SECURE FIELDS	MODERATELY SECURE	INSECURE FIELDS	BORROWED FIELDS
Keur Marie	2,263,825	224,825	421,825	506,025
Keur Magaye	6,225,686	1,552,925.5	2,406,701	1,468,425

TABLE 5
Hectares by Crop and Field Security

	PEANUTS	MILLET	OTHER CROPS	TOTAL
Keur Marie:				
Secure fields	21.9704	62.0347	3.4688	87.4739
Moderately secure	1.6905	4.4541	.555	6.6996
Insecure	5.1172	.8215	.0150	5.9537
Borrowed	4.9923	15.793	1.4875	22.2728
Keur Magaye:				
Secure fields	44.3496	65.3329	4.3444	114.0269
Moderately secure	17.2453	5.2243	1.2749	23.7445
Insecure	29.8194	12.2810	.8591	42.9595
Borrowed	15.5730	9.5406	.7651	25.8787

TABLE 6
Value of Land Services per Hectare
(in CFA)

	SECURE FIELDS	MODERATELY FIELDS	INSECURE FIELDS	BORROWED FIELDS
Keur Marie	25,880	33,558	70,851	22,719
Keur Magaye	54,598	65,401	56,023	56,743

summing between compound types, as is done in Table 4, the value of land services by field type is obtained. This amount is then divided by the total number of hectares of each field type (taken from Table 5) to obtain the value of land service per hectare for secure, moderately secure, insecure, and borrowed fields. This calculation is presented in Table 6.

Excluding for a moment the Keur Marie entry for insecure fields, the fields in Keur Magaye have about twice the value of land services as those in Keur Marie. Because earlier investigation showed that land-management practices in the two villages are fundamentally the same, the difference in the value of land services can be explained only by higher quality land in Keur Magaye as compared to Keur Marie. Since Keur Magaye is a younger, less populated village section, this is not unlikely. It was also shown earlier that farmers in Keur Marie are not as strict about following a peanut/millet rotation schedule as those in Keur Magaye are. This could lead to greater soil deterioration in Keur Marie.

Comparing now the value of land services between the different field types in the same village, there is not much variation in Keur Magaye, but in Keur Marie, the difference between insecure fields and secure fields is quite large. An explanation could lie in the fact that insecure fields tend to be planted in peanuts for individual consumption expenditure, while secure fields tend to be millet fields managed by the compound head for general compound consumption. The managers of the insecure fields have every incentive to plant extensively, knowing that they will benefit directly from the endeavor and that in most cases, they will not cultivate the same field the next year. As manager of the millet field, the compound head has incentive to plant carefully and wisely, knowing that the compound depends on millet, but he or she also has an interest in the long-term quality of the soil and might not plant so extensively. It is important to note, though, that the comparison being made here is between 5.9537 hectares and 87.4739 hectares. No conclusions can be reached.

Block 9 is empty; factors do not save or invest.

Block 10 lists imported labor by place of origin. In both Keur Marie and Keur Magaye, labor imported into the village is agricultural, and whether firdou, navetanes, or itinerant religious disciples, all of this labor originates in the "rest of Senegal."

Block 11 records compound consumption of both agricultural and nonagricultural goods and services produced in the village. The largest entries in this block for both villages are the compound's own consumption of millet. Table 7 shows the percentage of each crop in the two villages that was retained for compound consumption.

In Table 7, the distinction between the cash crop and staple is clearly drawn; very few peanuts are kept for compound consumption and very little millet is sold. In both villages, the other crop--primarily melons and vegetables in Keur Marie and manioc in Keur Magaye--is almost equally sold and consumed by the compounds. It should be noted that not one farmer in either village listed a neighbor as the purchaser of peanuts, millet, or other crops and that, conversely, in the consumption questionnaire, not one farmer stated that

TABLE 7
 Percentage of Harvest Retained for Compound Consumption

	KEUR MARIE	KEUR MAGAYE
Peanuts	6.5	2.4
Millet	99	98
Other crops	51	50

he/she had purchased any of these crops from a neighbor for consumption. This implies that a village market for consumption crops does not exist and that the consumption of these crops by village compounds represents a compound's own production exclusively. Nor did anyone answer in the consumption questionnaire that they had purchased any other village-produced goods or services but, as compounds did state that they had sold these good and services in the village, these consumption amounts were distributed to the different compound groups according to their income levels.

Blocks 12 and 13 are empty. Institutions do not directly pay out to factors or to other institutions.

Block 14 shows the amount of savings or capital accumulated by the different types of compounds over the year. In Keur Marie, the pattern is of large holders saving more than medium holders, who save more than small ones, but in Keur Magaye, large and smallholders save comparable amounts while medium holders save less than half the amount of the other two compound types.

Block 15 lists the amount of imported items consumed by the three compound types. The vast majority of all consumption goods and services consumed by the villages originates outside the village, and in both villages, all but 4,000 CFA worth of goods and services were bought at the weekly market. Village consumption goods consist primarily of clothes, foodstuffs (sugar, tea, coffee, condiments, fish, and so forth), and small manufactured goods (matches, pots, utensils, and the like).

Block 16 records the amount of seed stock that compounds retained for use in 1987. The amounts listed here are only the amounts above and beyond what was retained for the 1986 season. For example, the total amount of peanut seed saved in Keur Magaye for use in 1987 was 744,349 CFA, 94,372 CFA more than what was saved for 1986. In both villages, there was an increase in retained peanut seeds: 50 percent more in Keur Marie, and 14 percent more in Keur Magaye. The large increase in retained seeds in Keur Marie probably reflects the unease of Keur Marie farmers over the expected change in the government's peanut-seed distribution policy. The relatively small increase in Keur Magaye probably

reflects the confidence that the farmers in Keur Magaye have in the ability of their cooperative president to assure them of a continued supply of government peanut seed.

Neither village substantially increased its retained millet seed: 0 percent for Keur Marie, and 7 percent for Keur Magaye. The increase in Keur Magaye is too small to state with confidence that farmers in this section anticipated expanding millet production in 1987. But the increase in retained seeds for other crops in Keur Magaye reflects a definite trend; farmers are allocating more and more land to manioc production. From 1986 to 1987, 511 percent more seeds were retained for this purpose, and indeed through conversations with farmers it becomes clear that a manioc craze is sweeping this village section. No similar craze has hit the vegetable and melon farmers in Keur Marie and manioc is not popular in this area.

Blocks 17, 18, and 19 are empty.

Imported investments by village compounds are enumerated in Block 20. These investments are principally livestock and agricultural equipment. The investment in Keur Magaye that originates from the cooperatives is peanut-seed stock. What becomes evident from all of the investment-block entries is that investment in the two villages is not smooth; compounds in the sample do not have access to savings banks or credit unions and, as mentioned earlier, capital improvements in the land are not standard. Investment-good purchases such as horses, donkeys, sheep, goats, and cattle are lumpy and sporadic so that no real "rate" of savings can be calculated for the compound types on the basis of one year of evidence. Like many African societies, much saving and investment is put into livestock. This information is not included in the village SAMs. (Table 3 in Appendix Two shows animal stocks in the two villages.)

Block 21 shows the amount of village-produced goods and services exported outside the village. As can be seen, the organization of the peanut market is a bit different, with Keur Marie farmers having sold exclusively to the government-sponsored cooperative while the farmers in Keur Magaye sold 27 percent of their marketed surplus to peanut merchants from the rest of Senegal. As for millet, the farmers in Keur Marie did not sell any of their harvest to the outside world (or to anyone) while in Keur Magaye, a paltry 1 percent was sold at the weekly market or to merchants from the rest of Senegal. In Keur Magaye, the manioc crop was sold at the weekly market and to other points in Senegal while in Keur Marie, all of the vegetables and melons were sold to the Lebanese merchants from Dakar who were responsible for initiating these crops in Keur Marie. In neither village section were any services sold to the rest of Senegal, but more than 75 percent of the commerce activities (76 percent in Keur Marie and 87 percent in Keur Magaye) were completed in locations other than the village.

Block 22 is empty, with remittances and salaries from "exported" village labor accruing directly to compounds as is done in block 23. In block 23, a major difference between the two villages surfaces. In Keur Marie, 31 percent of village income originates from salaries or remittances while in Keur Magaye, this number is only 3 percent.

Blocks 24 and 25 are empty.