Report No. 2

Farming Systems Research Along the Senegal River Valley

A Rainy Season Food Consumption Survey in the Middle Valley Between Podor and Matam, Senegal

Senegal Agricultural
Research Project II

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FOOD CONSUMPTION IN THE SENEGAL RIVER VALLEY

A RAINY SEASON FARMING SYSTEMS RECONNAISSANCE SURVEY IN THE MIDDLE VALLEY BETWEEN PODOR AND MATAM, SENEGAL

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Executive Summary

This report presents the findings of a rainy season survey of food consumption conducted in Senegal in the Middle Valley of the Senegal River. Twelve villages between Podor and Matam were studied between October 6–15, 1986. Two similar surveys were conducted in Mauritania in February and September of 1986. The food consumption studies collected a wide range of information in an effort to understand what constraints farm families face in their efforts to feed themselves. Topics included food preferences, preparation, purchases and prices. The seasonality of food supplies and consumption was also investigated, as were techniques and problems of crop storage, use and importance of wild foods and frequency of free food distributions. Some of the food consumption issues related to health were included in the questionnaire, such as specialty foods for childbearing women and their infants.

This project was supported by USAID Dakar under the auspices of the Senegal Agricultural Research Project II, directed by the University of Arizona. The study formed part of a farming systems reconnaissance survey which examined a wide range of issues including cropping patterns, animal husbandry, and marketing. The food consumption survey profited from this systemic information as well as contributed additional information on women's farming and other economic activities, and vegetable gardening. The findings of the consumption survey are summarized below.

Food Preferences

- The shortage of traditional cereals such as sorghum and millet may account for a common preference for these foods.

- Food preferences are affected by a variety of factors including supply, cost, preparation time, cropping strategy and associations with the past.

- Meat was generally preferred over fish, perhaps because it is eaten infrequently.

Food Marketing and Purchases

- A significant portion of the food eaten by most farm families is purchased.

- Rice is available for purchase in virtually every village throughout the year.

- Fish, especially dried sea fish, is the most actively traded and universally available foodstuff.

- Some foodstuffs, such as oil, sugar, tea and powdered milk are widely available even in villages which lack formal markets. The range of goods which are imported is, however, limited.

Meals and Food Preparation

- Most families eat three meals a day, although quantities and quality of meals may diminish in times of food shortages.

- A limited number of dishes are prepared, most of which can be made with the whole range of available cereals.

- Long term changes in the diet include decreased consumption of fresh milk, butter and river fish and the addition of imported foods.

Food Storage and Depletion of Stocks

- Many farmers have stopped constructing traditional granaries due to small harvests, and store grains inside houses. Pests tend to be a more serious problem under these conditions.

- Virtually all households had depleted their cultivated grain stocks from the previous year's harvest by October and many had kept them only a few months. Stocks are quickly depleted by the need to sell them in order to purchase other foods.

Free Food Distribution

- None of the villages surveyed were currently receiving any free food aid. Some villages had child feeding programs.

Wild Foods

- Wild foods have decreased in availability with the drought but continue to be valued as a source of fresh food.

- Most commonly exploited are the wild fruits, but leaves used in sauces, and wild grains are also collected.

Seasonality of Foods

- The well-developed road network has diminished seasonal variation in the diet. Many staples including rice, fish and oil are available year round.

Food Prices

- Locally produced goods show less variation in price from one village to the next than do imports.

- The prices for basic commodities, such as rice and oil, fixed by the state show some markup, but not a great one in village markets.

Specialty Foods and Health

- Few specialty foods exist for childbearing women, their infants or the sick.

- Children are generally weaned at 18 months, but most have been given supplemental food since 6 months of age.

- Diarrhea is a chronic problem but most severe at the change of seasons, and when children are weaned.

Women's Farming and other Economic Activities

- Most women participate in farming either helping with the cultivation of their husbands' fields or tending their own crops or fields.

- Widowed or divorced women may take complete charge of farming operations, as may women whose husbands are long-term migrants.

- Case histories of a widow, a divorce, and a female fish trader are presented.

Food Consumption Constraints and Recommendations

a. Food Shortages

1. Improvements in the market infrastructure are needed to increase the range of foods reaching rural villages.

2. The promotion of higher value cash crops such as peanuts and sesame could provide a better rate of exchange and help safeguard the family's consumption of traditional cereals.

3. Investigate the possibility of creating cooperative food boutiques which could help minimize distortions in the market, seasonal variation in prices, and the lack of credit.

4. Efforts must be made to decrease storage loss to pests, especially with recent changes in storage technologies.

5. Reforestation programs could help alleviate the decrease in wild food availability.

6. The promotion of small livestock raising around the compound could supplement diminished milk supplies.

7. Research should be directed at the minor crops such as okra, melons and hibiscus.

b. Labor and Time Constraints

1. Efforts need to be directed towards maintenance of existing grain mills, including operators who are trained in simple repairs.

2. The burden of drawing water from wells could be alleviated with simple technologies such as pulleys.

3. Fuel efficient cookstoves would save time and fuel.

4. The time lost to sickness is significant and should be further studied, including the decreased use of traditional remedies.

c. Constraints of Female Farmers

1. Since an increasing number of women are responsible for agricultural decision-making, extension efforts should be directed more specifically at women.

2. Further study of women's access to and involvement in irrigated perimeters is needed.

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I. INTRODUCTION

A food consumption survey was conducted during the rainy season in Senegal in the Middle Valley region of the Senegal River between Matam and Podor. This survey was carried out between October 6–15, 1986 in conjunction with a farming systems reconnaissance survey . This project is supported by USAID/Dakar under the auspices of the Senegal Agricultural Research Project II. The study is directed by the Office of Arid Lands at the University of Arizona. The primary goal of the entire survey was to provide data on the farming systems of the region to help ISRA, SAED and OMVS establish research priorities for the research station at Fanaye. A wide range of issues was investigated by a multi–disciplinary team including cropping patterns, animal husbandry, off–farm economic activities and marketing.

A food consumption component was included in the reconnaissance survey in an effort to understand what constraints farm families face in their efforts to feed themselves, and to assess how these factors affect their productive activities. The links between consumption and production are thus considered crucial. This point of view accords with the new agricultural plan released by the Senegalese government in 1986 which places great emphasis on improving the food supply and standard of living of its rural inhabitants, while attempting to attain self–sufficiency in food production and increase agricultural exports (Diop 1984, ISRA 1986).

Many of the components of the new agricultural plan have implications for consumption. The desire to meet the food needs without depending on imported cereals, for example, is not only a production goal but acknowledges the difficulty many Senegalese face in securing adequate food supplies. Senegal presently meets only 60 percent of its cereal needs, relying for the rest on food imports which have been growing an average of 4 percent a year (ISRA 1986). The domestic production of cereals has been increasing at an average rate of .9 percent, but this small increase cannot meet the demands of a population which grows an average of 2.8 percent a year. ISRA estimates that production of cereals would have to double in the coming years to meet this goal. Meat consumption similarly falls below desired levels (averaging only 8 kg per person per year, short of the goal of 12 kg.).

Several of the objectives of the new plan will be discussed in this report. The goal of encouraging the expansion of private sector involvement in agriculture is relevant to the discussion of food marketing networks below. The market in foodstuffs in the Middle Valley was found to be limited, with few goods imported into most villages along the river basin.

The government also hopes to stimulate agricultural output by, among other things, providing better price incentives to producers. The dilemma which we found many farmers face is the necessity of selling or trading their harvests to enable them to acquire other needed foodstuffs. The poor rates of exchange which they receive for their produce explains, in part, farmers' inability to feed themselves from one harvest to the next.

The plan also aims at reducing post–harvest losses due to pests, an issue which this report discusses under the heading of Food Storage and Depletion of Food Stocks. The protection of the environment is also considered a high priority, including most importantly dealing with widespread deforestation. The discussion

which follows on the importance of wild foods to the diet, and the preferences for certain wild products over others, could help direct these efforts. Finally, the promotion of vegetable gardening as outlined in the new plan could have direct and beneficial effects on the diet of rural inhabitants and is discussed below.

A. Methodology

The food consumption survey aimed to provide a systemic overview of the basic diet, and methods for acquiring food of households in the study villages. A topical outline derived from secondary data sources and past surveys helped guide the conduct of interviews. Two female researchers were involved and gathered consumption data in 12 dieri and marigot villages (see Table 1 and Map 1). One of the researchers charged with food consumption issues had conducted a similar survey in Mauritania. The other researcher has been involved in previous socioeconomic studies in the same region through her affiliation with ADRAO.

The average food consumption interview lasted approximately two hours, and was designed to correspond to the in-depth farmer interviews being undertaken at the same time by other members of the team. Interviews were conducted with groups of village women rather than with individual women, yielding information pertinent at the level of villages rather than households. When time permitted, other interviews were completed with individual women in order to obtain data on their agricultural and trading activities. Translators, when necessary, were drawn from the villages themselves, and were primarily students (male and female).

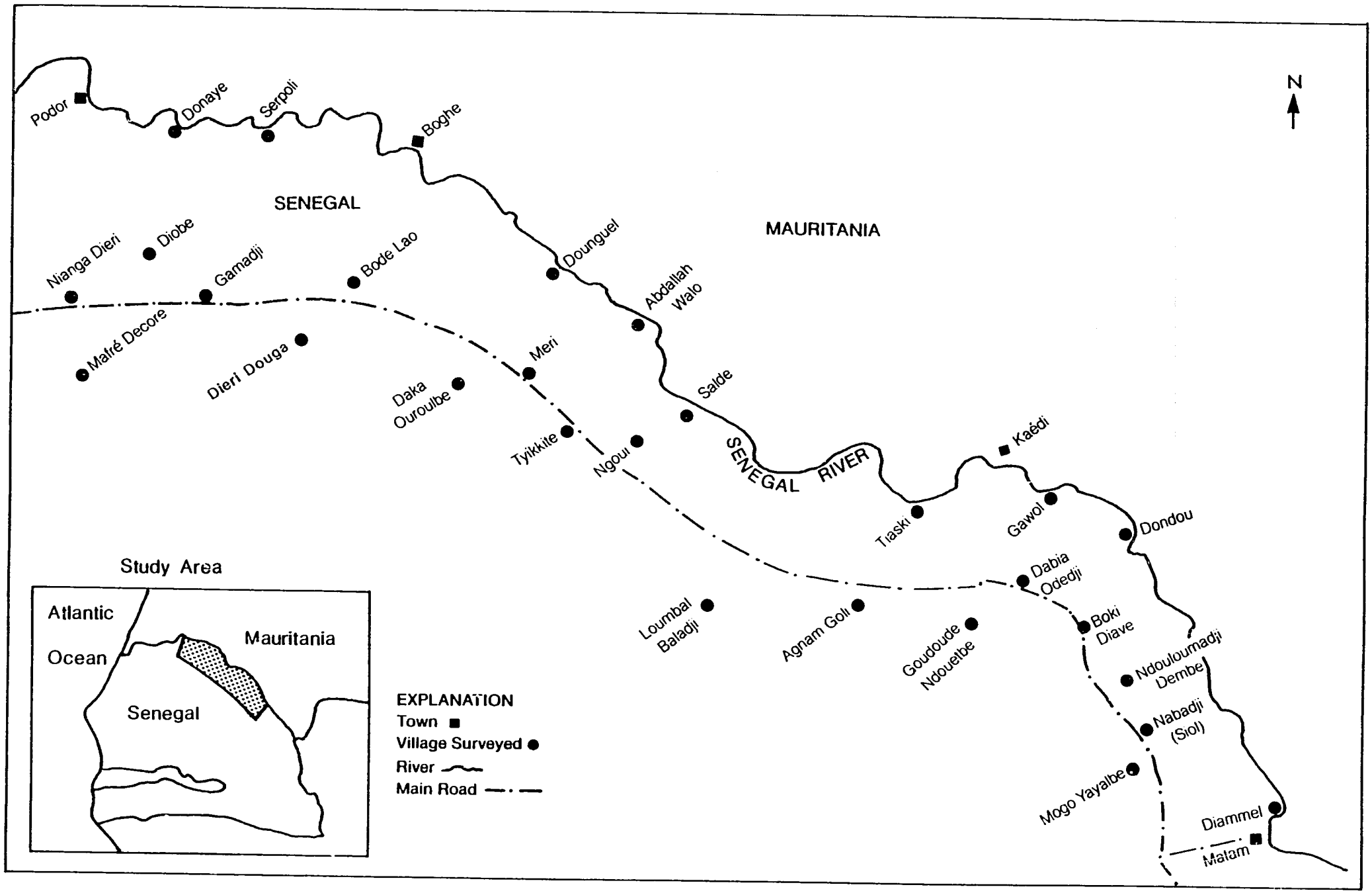
Each of the researchers worked alone so that more villages could be covered during the consumption survey. One of the researchers joined the team after the second day of fieldwork, the other after the third. They worked together on the fourth day to systematize data collection. These data were transferred from field notes to tables to allow inter-village comparisons. Both researchers were involved in team review sessions at Haire Lao and St. Louis to integrate consumption constraints and strategies into the farming systems survey results. At these sessions, some of the food consumption data collected as part of the village wide surveys was discussed (primarily food preferences and the availability of wild foods).

TABLE 1

VILLAGES SURVEYED

Date	Village	Location	Region
Oct 6	Diammel	River	Matam
	Nabadji Siol	Marigot	
	Moto Yayalbe	Dieri	
Oct 7	Dondou	River	Matam
	*Boki Diave	Marigot	
	Ndouloumadji Dembe	Marigot	
Oct 8	Gawol	River	Matam
	*Dabia Odedji	Marigot	
	Goudoude Ndouetbe	Dieri	
Oct 9	Tiaski	River	Matam
	* Agnam Goli	Dieri	
	Loumbal Baladji	Dieri	
Oct 11	Salde	River	Podor
	*Ngoui	Marigot	
	*Tyikkite	Marigot	
Oct 12	Abdallah Walo	River	Podor
	*Daka Ouroulbe	Dieri	
	*Meri	Marigot	
	Thioubulel	River	
Oct 13	Doungel	River	Podor
	*Bode Lao	Marigot	
	*Dieri Douga	Dieri	
Oct 14	Serpoli	River	Podor
	*Gamadji	Marigot	
	*Diobe	Marigot	
Oct 15	Donaye	River	Podor
	*Mafre Decore	Dieri	
	Nianga Dieri	Dieri	

Consumption surveys are available for the starred villages.



Map 1. Location of Villages Surveyed During the Rainy Season Along the Senegal River

B. Content of the Report

The report is organized into three main sections. The first and major section outlines general food consumption patterns. These include food preferences, food marketing and purchases, meals and food preparation, food storage and depletion of food stocks, free food distribution, wild foods, seasonality of food supply, and food prices. Inquiries also were directed toward health-related food issues including weaning practices, specialty foods for childbearing women and the most prevalent health problems.

A second section discusses the involvement of the women of the river basin in agriculture and other productive activities. Since most of the villages included in the food consumption survey were predominantly Toucouleur this report focuses on Toucouleur women. Some contact was made with Peuhl and Soninke women, but a discussion of their economic activities would require further study.

The final section outlines the major constraints related to consumption and makes recommendations for possible interventions and further research. The appendices include the topical outline used for the consumption survey, the data summaries of the results of the survey, a list of wild foods, and references cited.

II. FOOD CONSUMPTION PATTERNS

A. Food Preferences

Food preferences play a potentially important role in affecting the likelihood of farmers' accepting new or improved cultivars. For this reason, and in order to better understand farmers' current cropping strategy, the food consumption interviews elicited opinions on preferred grains and meat. These questions were not only asked of the groups of women who participated in the food consumption interview, but were included in some of the general village level questions directed primarily at men. These data thus give some insight into gender differences in food preferences.

Food preferences are a more complex issue than it might initially appear. Preferences are not simply a matter of taste, but are affected by a variety of factors including supply, cost, preparation time, variety of dishes, and cropping strategy. Supply, in turn, is not only a function of what the farmers grow, the size of their harvests and how long their grain stocks last, but also the extent to which foods are imported from outside the region, and thus their availability for purchase. Our impression was that the shorter a foodstuff was in supply, for whatever of the reasons discussed above, the more likely it was to be preferred. This may explain the common preference for millet which is the scarcest grain especially at the time of the survey in October. Other reasons for preferring millet are discussed below. This may also explain the general preference for meat over fish, since meat is eaten much less frequently. These same tendencies were also noted in the food consumption survey in Mauritania (Stone et al. 1986).

The more traditional grains, millet and sorghum, were those most commonly preferred. In some villages, sorghum (the same variety) was preferred (Gamadji) although millet was the most commonly mentioned (Agnam Goli, Meri, Mafre Decore). One reason cited by women for preference of these grains over rice or maize is that more food per unit of unthreshed measure is produced with these grains than with rice (Gamadji, Tyikkite). They also noted the versatility of preparation: a wider variety of dishes can be made from sorghum and millet (Gamadji, Agnam Goli). Many people also prefer the taste of these grains (Gamadji, Mafre Decore, Daka Ouroulbe).

Millet is also valued because it goes well with dried fish, which is the most common form of animal protein eaten (Agnam Goli). The women of Agnam Goli felt that the varieties of sorghum (same, fellah) went better with fresh fish or meat. Millet can also be eaten without either fish or meat, unlike rice, and so is more economical (Meri, Tyikkite). Some families eat the evening couscous plain if they cannot afford other ingredients (see strategies to deal with food deficits).

One group of village women stated that they used to prefer millet but since it has been in such short supply in recent years, they have changed their preference to sorghum (Dieri Douga). Others had the opposite reaction to the scarcity of supply noting that millet was their traditional staple and thus they preferred it out of habit (Meri, Agnam Goli). For farmers, millet also has good associations with times of abundance (Mafre Decore).

Several villages associated specific cereals with specific meals. Most commonly, rice is preferred at the midday meal and sorghum and millet for dinner (Dondou, Abdallah Walo).

Preparation time affects food preferences, but there was not complete agreement on which cereals were the most time consuming to prepare. Everyone agrees that rice is the fastest to prepare (excluding time spent on threshing paddy) and that maize is the most difficult to process. Beyond that, however, some women said that sorghum and millet take the same amount of work (Dieri Douga), some that millet is more difficult to prepare than sorghum (Diobe), or some said the opposite that sorghum takes more time (Meri). Women in Diobe said that some cereals do take more preparation time than others, but they did not consider this as important a consideration as availability.

Some villagers valued variety in their diet, and so expressed no strong preference for any one cereal. Maize is considered difficult to process and pound but is still liked for its taste and eaten in a variety of forms (couscous, gniri, bouillie) even in villages without power mills (Ngoui).

Taste preferences seem to vary by age and as a result of contact with urban taste preferences. The young express a preference for rice while the older people generally prefer millet or sorghum (Agnam Goli). Given the high incidence of temporary rural–urban wage migration, the identification of the young with urban lifestyles is not surprising.

Meat was generally preferred over fish. The smaller villages without butchers only eat meat on special occasions (Meri) and even where meat can be purchased, it is more costly than fish. Most villages eat fish daily, and those whose source is primarily dried fish expressed a strong preference for fresh fish (Ngoui). Villages composed primarily of fishermen much preferred fresh fish over both dried fish and meat (Ngoui). Others valued the variety (Dabia Odedji).

Villagers in Mafre Decore, whose principal activity is herding, told us that they much preferred meat over fish. However, since eating meat requires killing an animal, they preferred to eat fish. Their desire to rebuild herds decimated by drought thus was stronger than their food preferences.

Some gender differences in preferences were noted. The women of Dieri Douga and Gamadji preferred meat while the men preferred fish. This may be influenced by the fact that men are commonly responsible for providing the more expensive meat to the family, while women regularly acquire fish as one of their daily purchases. The women of Gamadji stated a preference for sorghum, while the men preferred millet. These women thought that sorghum yielded more food per measure of grain than did millet (and consequently more food per unit of processing time). The role of women in grain processing and cooking may thus affect their preferences.

The relative importance of remittances, accessibility of villages to transportation, the presence of rice perimeters and power cereal mills are parameters which distinguish villages, and which might have interesting effects on food preferences. It is difficult with our data to analyze these factors fully and they deserve further study. A few suggestions which emerged from the study are discussed below.

In general, what a family eats in the present situation is determined by what members can afford to buy, not what they can grow. The amounts and frequencies of remittances, which vary more between households than between villages, has crucial effects, therefore, on what the family eats. Given the limited range of

goods available for sale, however, the relatively prosperous family eats more of the same foods as the poor family, not different foods. Almost universally, the food people would buy if they had more money is meat, and the richer households can more frequently fulfill this preference. If a food is seasonally unavailable in the market, such as millet in October, no one eats as much as they might like.

As discussed below under marketing networks, no villages are completely cut-off from access to food markets, and so this distinction does not seem to translate into differences of preference. Similarly, the presence of rice perimeters seems to have no effect on preferences, since all villages have easy access to rice. Women do not seem to count their food preparation time as an important consideration in determining what they prefer or what they cook. The presence of power mills does not, at least on first study, affect preferences.

B. Food Marketing Networks and Purchases

A significant portion of the food eaten in most villages is purchased. This is especially true after stocks of cultivated cereals have been depleted. For many households this period covers more than half the year (see food storage). Despite the fact that an all-weather road exists through the study region, the market structure is such that a relatively narrow range of foodstuffs reaches most villages.

Rice is available for purchase in virtually every village throughout the year. Although some of the rice consumed has been grown on village perimeters, much of the individual farmer's rice is used to repay debts, to recompense relatives and friends who contributed labor to rice cultivation, and sold or exchanged for other necessary ingredients (Gamadji, Dieri Douga, Diobe, Agnam Goli, Meri). Despite the fact that rice is more expensive and requires more condiments than other grains, its widespread availability must explain, at least in part, the frequency with which it is eaten.

Sorghum is the next most commonly sold grain, although supplies were low at the time of the survey in October. There was no millet at all in most villages, and none was seen for sale in village markets. The diminished supplies of sorghum and millet reflect primarily the poor harvests of the preceding years. As with rice, some sorghum and millet are sold locally to enable the farm family to purchase other foodstuffs. Unlike rice, however, little of these grains is imported from outside the region.

The most actively traded and universally available foodstuff is fish. Fish, especially dried fish, is for sale in virtually every village throughout the year. Because of the great decrease in river fish, almost all the fish marketed is sea fish coming from Dakar and St. Louis. Villages which are situated near the main road are able to buy fresh sea fish on an almost daily basis from the trucks traveling eastward (Tyikkite, Gamadji, Boki Diave, Dabia Odedji). Some women specialize in this fresh fish trade and spend the night next to the road to purchase baskets of fish for resale the following morning in the village market. Villages situated well south of the road in the dieri (eg. Mafre Decore) travel to the road to buy fish as well, but are confined primarily to dry fish because of distance and perishability.

Other non-perishable goods which are widely available include cooking oil, sugar, tea and powdered milk. Various spices such as black and red peppers, maggi (bouillon cubes), and dried sauce leaves are also for sale in most villages. The only

vegetables which reach most villages with any regularity are onions and tomatoes (usually concentrated) although during the dry season when vegetables are locally cultivated, a much greater range is available.

Even when a village lacks a formal market or stores (boutiques) the goods listed above are usually available for sale by petty traders selling out of their houses. In these situations, there may be periods when goods are unavailable in the village and women are forced to travel to neighboring markets to purchase foods. In some cases, especially the villages situated on the river, this may require a boat trip during the rainy season (Salde, Abdallah Walo).

Larger villages are often home to a butcher, and so meat can be purchased by the kilogram (Boki Diave, Dabia Odedji, Diobe). Those villages too small to support a butcher, eat meat very rarely and often only for special occasions such as the festival of tabaski or for baptisms, etc.

Rice, fish, oil, and tea were mentioned as the most frequent daily purchases. Most women can afford to buy only enough food for the daily ration, and so food shopping is part of their daily routine. Some families, however, who "wake up without a penny" must go some days without making any purchases (Dieri Douga).

Few families can afford to purchase in bulk. In Dieri Douga, the women said that some households are able to buy sacks of grain rather than a few kilograms at a time. However, none of the group of women interviewed knew the price for whole sacks, leading us to believe such purchases must be rare and confined to a few individuals. After harvest, bulk purchases are more common. By October with diminished grain supplies and dependence on grains brought in from outside the area, they are very rare (Diobe). No goods besides grains were ever cited as purchased in bulk. For some families, the purchase of a whole kilogram package of tea represents a bulk purchase (many buy tea by the small tea glassful). This illustrates not only the small scale but the daily precariousness of many families' food budgets.

C. Meals and Food Preparation

There is little variation between villages in the dishes eaten or in daily menus. Specific ingredients vary by availability, but the basic recipes are similar across villages and seasons (Table 2).

Most women reported eating three meals a day, although they generally cook only twice a day. The morning meal, which is usually eaten between 8 and 10 a.m., is the most varied. Some families eat bread with coffee, milk and sugar (Dabia Odedji, Agnam Goli, Meri, Ngoui, Gamadji, Dieri Douga, Diobe, Tyikkite, Daka Ouroulbe, Bode Lao). This, however, is an expensive meal and bread is not available in every village. Some families drink tea instead, and may prepare quinqueliba, a tea which can be gathered locally or purchased inexpensively (Agnam Goli, Gamadji). The milk may be powdered or fresh depending on availability. Families who keep their own goats may milk them in the morning for the breakfast meal (Daka Ouroulbe).

Others make a breakfast of leftovers from the previous evening's couscous. This may be served with fresh milk or leaf or meat sauce, but if the family cannot

TABLE 2

DISHES, INGREDIENTS, PREPARATION

BASIC HIERARCHY

Dish (Pulaar)	Description	Preparation Technique	Ingredients	Cereals	Preparation
Gossi	Grain porridge	Boil whole grain	Grain, sugar,milk	Any (suited to maize)	Little
Gniri	Cracked grain	Pound grain coarsely and boil	Grain and variety of sauces	Any	More (can combine w/ couscous)
Couscous	Steamed flour	Pound grain into flour	Grain and variety of sauces	Any (rarely maize)	Several hours unless mill
Bassi	Very fine couscous	Continue pounding	Grain, sugar, milk	Any but not with hard kernels	Most

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OTHER DISHES

Mafe: Different types. Often feature peanut, fish and okra sauce served on rice or porridge.

Bouillie: Liquid grain porridge

Zrik (Toufam): Milk mixed with water and sugar

Laru: Gniri mixed with hibiscus, fish and salt

Thieboudjen: Steamed rice with sauce of vegetables and fish

Yaninongo: Pounded cereal and cowpeas boiled together

Nire: Boiled cowpeas

afford these ingredients they can eat couscous plain with water and sugar (Agnam Goli, Ngoui, Meri). This meal takes minimal preparation time. Some women serve a sort of porridge called gossi in Pulaar (sombi in Soninke) which is the whole grain boiled with sugar and milk (Boki Diave). Gossi can be made from any cereal including rice, maize, sorghum or millet. Although the grain must be cleaned, it does not have to be pounded or ground for this dish, making it practical as a breakfast food. As with couscous, gossi may be served plain if the family cannot afford sugar or milk.

The midday meal takes two basic forms, and may be eaten as early as 1 or as late as 4 p.m.. Many families eat boiled rice dishes for lunch, while some prepare a dish known as gniri in Pulaar. Rice requires some sauce, minimally some oil and spices, but usually is served with fish, either dried or fresh as well. Other condiments may include canned or fresh tomatoes, maggi cubes, red and black peppers, vinegar, hibiscus leaves, etc. Some rice dishes are named and have more fixed recipes. Mafe is a rice dish in which the sauce is cooked separately and features okra and/or peanut sauces.

Gniri is a boiled cereal dish which is made with cracked rather than whole or pulverized grains. Gniri can be made with any grain and thus varies by availability. The preparation of the midday and evening meal can be partially combined in one process. A first pounding in the morning results in incompletely processed flour. The cracked grains are sifted out and prepared as gniri for lunch, while the finer flour kept for the dinner couscous. Gniri is served with a variety of other ingredients. Gniri buna is common and features dried fish. Gniri may also be served with fresh fish (gniri lidi), milk (gniri kwassam), melon seeds (beref), cowpeas, oil, or some combination. Gniri requires fewer extra ingredients than does rice and so is a more economical meal than is rice (Dieri Douga). Some gniri dishes have special names and more fixed ingredients. A dish known as laru is gniri mixed with hibiscus leaves, fish and salt.

Dinner is usually eaten between 8–10 p.m. Almost universally, the evening meal consists of couscous with a variety of sauces. Couscous is steamed flour made from the whole range of cereals including rice, sorghum, millet, maize and the wild grain paguiri. Couscous, like gniri, is served with fish, both fresh and dried, meat, sauce leaves, peanuts, oil, tomatoes, milk, and beref. If the family cannot afford sauce ingredients, couscous can be eaten plain with salted water (Gamadji, Dieri Douga). The couscous itself requires the addition of baobab leaves (lalo) which are said to make the couscous easier to swallow and more palatable.

Some inquiries were made into long–term changes in the diet. Villagers were asked which dishes were no longer eaten since the drought, and which dishes are new. In general, women noted the decrease in milk and butter supplies as well as in river fish. More recent additions to the diet and substitutes included ocean fish, powdered milk, peanut oil and rice dishes (Dieri Douga, Diobe, Mafre Decore). For example, one dish which is less commonly eaten today is gniri meri or gniri with butter. Dishes featuring cowpeas are also less commonly prepared than previously, reflecting the scarcity and high cost of cowpeas. Women said that in the past, cowpeas were treated more as a grain, whereas today they are eaten primarily as a sauce ingredient. So a dish such as yaninongo which is made of boiled cowpeas and pounded cereal is infrequently eaten (Ngoui).

The basic regimen followed by most families is thus well adapted to variations in the availability and affordability of ingredients. The same basic dish may be prepared with a minimum of ingredients, limited to the grain itself, or with a whole range of condiments. This allows flexibility in both the long and short runs, to react to fluctuations in food availability by season, income and competing demands for women's labor.

D. Food Storage and Depletion of Food Stocks

The methods of grain storage vary not only by cereal, but by the size of the harvest and the proportion of the harvest marketed. In the past, grains were stored in special storage huts called sak. Sak are small round huts with raised wooden floors, woven stick walls and thatched roofs. Although sak are still seen in some villages, we were told that they are no longer routinely constructed because the harvests are not large enough to warrant them. According to the women in several villages (Dieri Douga, Diobe), the sak were more impervious to insect and rodent damage than are present storage methods. The heads of the sorghum or millet were individually laid into the sak in a criss-cross pattern making it difficult for pests to penetrate the stores. Another traditional storage structure, the fauru or mud granary is also less commonly built in the current era of greatly diminished harvests.

Nowadays, most grains are simply stored inside houses, either lain on the floor (sometimes on wooden platforms) or inside storage bins or bancos. Some families process all their grains at once and store them in sacks, but most leave the sorghum and millet on the stalk and the women process these only as needed for consumption or sale. Bulk processing is often done when grains are intended for sale. Rice is often handled this way, with threshing and winnowing completed shortly after the harvest. Rice is also the most commonly sold crop.

Grains stored inside houses are prone to significant pest damage. Although it is difficult to judge what proportion of the harvest is lost to pests, one can say that the villagers themselves consider it a serious problem; whatever is destroyed is too much in an area characterized by precarious food supply.

Most commonly mentioned pests were termites and rats (Dieri Douga, Diobe, Dabia Odedji, Ngoui, Meri, Bode Lao), but cowpea weevils are also a problem (Agnam Goli, Ngoui). Farmers have some techniques for protecting their stocks, but they do not consider them very effective. The use of insecticide dusts was considered the best method, but most families cannot afford them or cannot find them to purchase (Dabia Odedji, Bode Lao, Tyikkite). One village was receiving some HCH from SAED, but villagers said they did not have enough. Some households keep cats or set mousetraps against rodents; others said they merely "beat the mice with a stick" (and laughed at how futile this was). Termites are controlled by frequent turning and checking of the bags. If termites are found they are picked and swept out of the grain (Agnam Goli). Cowpea weevils can be controlled by placing the cowpeas in a sealed jar mixed with ashes and sand (Ngoui).

Virtually all households had depleted their cultivated grain stocks from the previous year's harvest by the time of the survey in October. The number of months that grain stocks last varies significantly, however, from one household to

another. Depletion of stored grains is more a result of the portion the family must sell or exchange in order to buy other foods, than the proportion which they eat. Some ran through their stocks within a month of the harvest because of this (Dabia Odedji, Ngoui) while others managed to keep stocked grains for at least six months. Over half of the rice harvest may be sold to buy other ingredients (Diobe). Some households had managed to keep enough seeds for the upcoming walo planting, but others were purchasing their seed grains (Dieri Douga, Diobe). The average number of months kept in storage seem to be two to five for both rice and sorghum.

E. Free Food Distribution

None of the villages surveyed had received any food aid during the past year and some had not received any for two or three years. When food aid was delivered, it apparently averaged 2–3 kg. of grain per person, although one village reported that as much as 10 kg. were received per person.

Some villages have child feeding programs in place (PPNS). The village of Ngoui for example receives food for their program about once a month. Although in the past, the food was cooked cooperatively, each mother is now given a certain amount of food depending on how many children she has between the ages of 3 months and five years she has. Each child is alloted 4 kg of cereal, 1 liter of oil and 2 packets of milk powder. It is not clear that the food would necessarily be used to feed only the children.

Other women seemed to be unhappy with the management of the PPNS. We were told by the women in one program that each child must be weighed monthly for eight months before they can be accepted into the program. The mother pays 200 CFA each of these months, without receiving any food. At the end of that period if the child is considered underweight, the mother can, by paying an additional 200 CFA per month, receive 4 kg of cereal, 1 litre of oil and 2 cartons of long-life milk per child. The women did not consider the program worth the time or expense, so many of them were not participating. We were not able to confirm their complaints.

F. Wild Foods

Wild foods can take on special importance during hunger periods, whether seasonally between harvests, or over longer periods of drought. Unfortunately, the environmental conditions which have affected cultivated output also tend to diminish the natural flora from which foods can be gathered. In the river valley, where many of the wild foods are collected from trees, availability has also been compromised by deforestation resulting from firewood collection and charcoal making. Many villagers noted that the supply of wild foods had greatly decreased with the drought, and that they had to travel longer distances to find them.

Wild fruits were being gathered at the time of the survey in October and continue to be available until December. The most commonly mentioned was the fruit of Ziziphus mauritania (jaabe in Pulaar and jujube in French). The small orange fruits are eaten especially by children, but the tree also has medicinal uses. Balanites aegyptiaca (murtode in Pulaar, mureau blanc in French) also produces small

yellow fruit, yields soap from its nuts, and is used medicinally. Boscia senegalensis (guidjile in Pulaar) is also a fruit tree. Some women said they were going out morning and night in October to collect these fruits (Ngoui). When asked which wild foods were preferred, most women mentioned these fruits, noting that these are the only fruits they eat (Meri).

Another shrub which is commonly used is the quinqueliba. Leaves are brewed into a tea which is drunk by families who cannot afford to purchase Chinese green tea.

The other major category of wild foods are leaves used in sauces. Most frequently mentioned and most abundant is Cassia tora (oulo in Pulaar). Oulo is gathered and eaten virtually every day in the early rainy season. By the time of the October survey, most families were eating haco (leaves of the cowpea) instead. Other wild green leaves which are eaten include tupere, sappato, and tireo.

Some wild tubers and grains are exploited. One water plant, Nymphaea lotus, was frequently mentioned and is available in the early rainy season. The root resembles a potato (tabbe in Pulaar) and the flower produces an edible seed (dayrrii in Pulaar). In recent years, the marshy areas where this plant grows have often been too dry to produce the water plants.

Most wild products, especially the fruits, enter the market place, although many women collect them solely for household consumption. Some products are less available to villages living in certain zones of the river valley (river, marigot, dieri) and so products are sold or exchanged between these zones. Quinqueliba, for example, grows in the drier dieri areas and so is brought down to the river villages for sale by nomads (Ngoui). In turn, the river villages have access to more abundant supplies of other products, such as oulo, and bring them to the dieri villages (eg. Agnam Goli) for sale or trade. These microenvironmental differences thus stimulate an exchange of wild products.

The most actively traded products are those of the baobab tree. The baobab produces a fruit (pain de singe in French) which is eaten and used to treat diarrhea. The leaves of the baobab (lalo in Pulaar) are especially valued as an ingredient in couscous, and the bark of the tree is used to make cord. The number of baobabs has greatly decreased in this region in the drought years, and many villages have no access to the trees (Diammel, Gaol, Nabadji, Dabia Odedji, Dounguel, Meri, Diobe, Agnam Goli), while others must travel long distances to find baobob (Gamadji, Dieri Douga). Some baobabs are individually owned (eg. the village of Ngoui has only two trees both belonging to one man) while others are open to public access (Goudoube Ndouetbe). Because of the high demand for baobab products, they are imported into the region from as far away as the Casamance through Dakar.

The wild grains include brachiaria hagerupii (paguiri in Pulaar) and Digitata exilis commonly known as fonio. Paguiri is a particularly important wild food because of its widespread availability and its substitutability for cultivated cereals. Yet attitudes about gathering and eating paguiri revealed some ambivalence. It is thought of as a hunger food, and associated with the very poor. Poorer families may collect as much as one sack in a year (Ngoui), although many people gather only a few kilograms at a time when they have run out of other grains (Meri).

Young girls may also collect the grain, which implies that it is not worth the time of adult women (Agnam Goli). Paguiri has the added disadvantage of being difficult to process and pound. Nonetheless, many people like the taste of paguiri (Ngoui), and collect it for variety in their diet. A few villages no longer can find paguiri in their environs and miss it (Dieri Douga, Diobe).

Despite, or perhaps due to diminished supplies of wild foods, they retain their value along the river. The wild fruits and leaves are still virtually the only source of fresh foods and vitamins throughout much of the region and the year. European vegetables are available during the cool dry season, but no other fresh foods are available in the fall and winter months when the wild foods are producing. If the vegetable growing season were extended, the importance of gathered products might diminish. The strong preferences for wild foods that were expressed make it more likely, however, that they will continue to be important and that replanting of these useful species would be welcomed. The villagers of Abdallah Walo, for example, made a special request of a forestry project for wild fruit trees (Ziziphus mauritania and Balanites aegyptiaca).

G. Seasonality of Foods

One effect of the well-developed road network along the river has been to diminish seasonal variation in diet. Many of the staples including most importantly rice, fish and oil are available year round. What seasonal variation persists is thus more a function of the individual household's harvests and ability to purchase foods at different times of the year, than a lack of supply.

The depletion of stocked grains by about June of each year means that until the dieri and rice harvests in the fall (October-November), a serious shortage of locally grown cereals occurs in the summer months. Almost all villages mentioned the scarcity of grain, as well as cowpeas and peanuts, during the October survey.

Vegetable growing is confined to the cool dry months between November and March. The rest of the year, very few vegetables are imported into the region although onions and peppers are trucked in from the coast (Dabia Odedji, Agnam Goli, Ngoui). Some of the larger villages were also receiving other vegetables such as tomatoes and eggplant in October (Dabia Odedji).

Many women noted that although most foods were available for sale throughout the year, their cost varied widely and thus made them beyond reach during certain months. The women of Boki Diave, for example, reported that sorghum (same) cost two and a half times as much in October than it did after the harvest (125 CFA/kg vs 50 CFA/kg). The price of cowpeas is similarly variable. Although some can be purchased in October, its price is so high that no one buys it to eat, but only for seed (Dieri Douga).

In contrast to Mauritania, the villages surveyed in Senegal do not experience as serious a shortage of fish during the rainy season. Most villages, especially those along the main road, have access to both dried and fresh fish from the coast every day (eg. Boki Diave, Dabia Odedji). Even the villages cut off from the road during the rains can travel by boat to nearby towns and acquire fish on occasion.

Milk is most abundant during the rainy season and so milk consumption goes up during these months. Some of the fish sellers noted that the demand for fish drops during the rains because people are drinking more milk (Ngoui, Meri). Powdered milk is widely available and can substitute for fresh during the dry season.

H. Food Prices

Price data on some of the more common foodstuffs were collected in the villages included in the food consumption survey. Price differences between villages can give insights into the workings of the regional market, including the effects of the size and relative isolation of individual villages. The relative ease of movement between most villages, however, minimizes the potential effects of price differentials. Paying a higher price in a smaller village reflects a lack of time rather than a lack of alternatives. The middlemen or women can thus take advantage of these time constraints.

Certain goods show more variation in price from one village to the next than do others. Interestingly, locally grown grains seem to have a more stable price across villages than do imported products such as oil, sugar and tea. This is true despite shortages of these grains at the time of the survey in October. The prices may well be high across the board for these grains, because of overall scarcity, while the imported products, which are less affected by seasonal fluctuations in supply are more responsive to such economic factors as village size (demand) and location (transport costs). Confirmation of this hypothesis, however, requires seasonal price comparisons which could be provided by a dry season reconnaissance survey.

Sorghum prices, thus, were remarkably similar across markets, and was selling for 125 CFA/kg in all but two of the surveyed villages (Ngoui, Meri). Most villages had no millet available for purchase. Curiously, where millet was available the price was the same as for sorghum (Boki Diave, Dabia Odedji). Melon seed also sells for a standard price (125 CFA/kg.) in virtually every village. Cowpeas are very costly and rare with prices as high as 150 CFA for a small tea glassful.

Just because a village is small or off the main road, does not necessarily mean that it will pay higher prices for all foodstuffs. The village of Ngoui, for example, (population of 652 people) does pay the highest price for cooking oil (500 CFA/liter) but pays the lowest listed price for sorghum (100 CFA/kg.). The much larger village of Gamadji (population of 2000 people) pays much less for its oil (425 CFA/liter) but more for sorghum (125 CFA/kg.). The same pattern holds true for sugar prices. In general, locally produced goods show less variation in price than do imports, but when sold within small villages they may command lower prices relatively. Imported goods may cost more in smaller villages, but similarly, goods which do not get out of the village may cost relatively less.

Prices for basic commodities are fixed by the state, yet the parallel market is an active one. The official price for meat for example, at 350 CFA/kg is about half of what meat is sold for in the surveyed villages. This is an extreme example of markup, however, and most goods show less variation from official prices. The price for cooking oil, for example, is set at 400 CFA/liter in Dakar and most

villages spend between 425–500 CFA/liter for their oil, a difference of 20–25 percent rather than 100 percent. Rice, similarly, has an official price of 165 CFA/kg in Dakar, and was selling for 180–200 CFA/kg in the villages. This relatively small markup in the price of rice confirms the findings of Morris (1986).

Comparison of prices for goods which are sold by the pile or item rather than by weight are more difficult. This applies not only to fish, but to condiments such as onion, tomatoes, and peppers. In general, a pile of three small fresh fish cost 100 CFA, although some villages paid the same price for a pile twice that size. The prices for dried and fresh fish are not as different as one might initially suppose, but dried fish of course goes much further in cooking than does fresh.

Powdered milk prices are very high, costing from 500–1000 CFA/kg depending both on quality and supply. The supply of fresh milk was said to be greater during the 1986 rainy season than it had been in the past few years. Fresh milk prices were thus quite low (125 CFA/liter). According to the milk-selling Peuhl of the village of Mafre Decore, in 1985 they had sold their milk for as high as 1000 CFA/liter. A significant proportion of the milk supplies are traded rather than sold. The exchange rate has generally been equal volume measures of milk and cereal, reflecting the shortage of grains as well as milk.

I. Specialty Foods: Childbearing Women, Infants and the Sick

Few specialty foods exist for childbearing women or their infants. Certain dishes from the normal repertoire are considered more appropriate than others, but in general, since ingredients are limited and time spent in food preparation is already burdensome, few separate foods are prepared.

Porridges are used widely as weaning foods, given to children of non-lactating mothers, and the sick, as well as to women who have just given birth. These usually take the form of bouillie, but may also be the more liquid ruiz or the ground form of bouillie called gossi. Milk is also fed to all these categories of people. In general, any available cereal is used to make these porridges but some women expressed a preference for rice for the small infants (Dabia Odedji, Ngoui). Some women use eggs as a weaning food (Boki Diave), disregarding the traditional taboo against feeding eggs to children.

After childbirth, women are given soups with chicken or meat. The meat is provided by the husband if he can afford it. A well-to-do husband kills a sheep at the time of the birth (Meri). If he cannot, the woman eats everyday food especially bouillie and gossi. Some women make a special point of drinking milk at this time (Meri), others drink hot water or quinqueliba tea (Agnam Goli, Ngoui). Women return to work anywhere from two weeks to two months after childbirth. This depends primarily on the demand for the woman's labor, but also on her own and the baby's health.

Children are generally weaned at 18 months, although some are weaned much earlier if the mother becomes pregnant again, or as late as 36 months (Ngoui). Some children apparently lose interest in breastfeeding before the normal age of weaning (Dieri Douga). Weaning is usually done very abruptly, often in a single day. The child may be taken to a marabout to be administered a potion (Tyikkite),

the mother may rub sand on her breasts (Bode Lao) or the child is given to someone else for a few days. Most mothers have begun supplementing breastmilk by about 6 months (or whenever the child can sit up) with the weaning foods discussed above or with small portions of adult foods. Others, however wait until the child is weaned. The mothers of Dabia Odedji used to withhold supplemental foods from their children until they were given adult food at two years of age. They have been told at the local medical center, however, to start feeding them milk and ruiz earlier. Children of non-lactating mothers used to be given to a wet nurse, but now more commonly are fed fresh milk and ruiz with a bottle (Dabia Odedji, Ngoui, Diobe).

Most women agreed that food taboos were beliefs of the past, and that today only the Moslem prohibitions against eating certain meats are still followed. When asked what foods were tabooed to pregnant women, people most commonly answered none, but sometimes they mentioned foods that are no longer part of the diet. Several groups of villagers said, for example, that crocodile meat was tabooed to pregnant women because it was thought to cause sexual problems in the child (Boki Diave, Dabia Odedji, Meri). Others mentioned that rabbit meat was tabooed because it is a bloody meat and thought to cause excessive bleeding during delivery (Dabia Odedji). One group of women said that in the past they did not eat couscous at all during pregnancy, but only gossi or bouillie, for fear of harming the child. Now the doctor tells them to eat everything, but to avoid too much salt. Similarly, there are no longer any foods tabooed to children.

J. Diseases and Health

The most commonly mentioned diseases were diarrhea, measles, conjunctivitis and malaria. Other less commonly mentioned sicknesses included coughs and colds, fevers, schistosomiasis, muscle and stomach aches and fatigue.

Diarrhea is a common problem throughout the year, but is especially troublesome at the change of the seasons and when children are weaned. The women of Diobe said that many children die at the age of weaning. In one village, women said they had particular trouble with diarrhea caused by the milk from the free food distribution (Tyikkite). This may well be true, if they are using contaminated water to mix the milk. Most women take themselves and their children to the local medical center when a severe case of diarrhea occurs, and have stopped using traditional remedies. The women of Boki Diave said that in the past they used to treat diarrhea with medicines from wild plants, but that many children died. Some traditional remedies are still in use including drinking tea made from the leaves of the Ziziphus mauritania or the leaves of the baobob. At the medical centers, women are sometimes taught how to make oral rehydration fluid (Meri).

Most other health problems are also best seen as treated by infirmaries and medical centers. Some people still use traditional treatments such as Balanites aegyptiaca for stomach aches (Agnam Goli, Meri), honey for coughs (Agnam Goli), or various "leaves" to reduce fevers (Ngoui). Less common nowadays, but still practiced, are the slits cut next to the eyes to treat conjunctivitis or slits cut in the forehead to reduce malarial fevers.

Of the twenty–two villages surveyed, six had operating clinics or dispensaries (Diammel, Dondou, Salde, Boki Diave, Bode Lao, Meri). Several other villages had dispensaries which were under construction or constructed but unstaffed (Dounguel, Abdallah Walo, Nabadji Siol, Gamadji). All of these villages are either along the river or in the marigot zone; none of the dieri villages surveyed have any medical facilities. These villages, of course, tend to be smaller.

III. WOMEN'S FARMING AND OTHER PRODUCTIVE ACTIVITIES

In a region characterized by high rates of male out-migration, both seasonal and long-term, women are the most permanent rural residents and constitute an important source of labor. According to the women themselves, their labor input into agriculture has increased over recent years and has become especially important on the irrigated parcels. Toucouleur women in the past played a minor role in farming, supplementing male labor only occasionally and during such labor intensive tasks as sowing and harvesting.

Most of the Toucouleur women today still contribute only marginally to agriculture if the male household labor force is adequate. Women who are widowed, divorced or have become household heads for other reasons, however, can take complete charge of agricultural production.

The majority of women thus help on their husband's dieri and walo fields. Women are involved in the planting (often dropping the seeds into prepared holes), participate in the harvest, and transport and process the crops. Some women take charge of the crops intercropped with the cereals, principally cowpeas and melons in the dieri. The women of Ngoui, a village with access to relatively extensive walo land, plant a whole range of crops on the walo lands. They cultivate sweet potatoes, tomatoes, hibiscus, cowpeas, okra and a range of different melons. Sweet potatoes are propagated with cuttings and started, along with tomatoes, in small seedbeds around the compound. These seedbeds are carefully tended, watered twice daily, shaded and fenced. The attitude that walo land is exclusively for males was expressed in only one village (Diobe), although this was apparently more widespread in the past.

Some women are given a small portion of their husband's fields to cultivate separately, although with the reduction in arable land due to the drought, there is generally little land to spare from household production. Some women who used to farm have moved into trading in response to the restricted opportunities open to them in agriculture (Meri).

Widowed women usually farm land which they have inherited from their husbands, while divorced women must borrow land from their natal family. They tend to follow the same farming and cropping strategies as men, planting millet, cowpeas, melons and hibiscus on the dieri land, and sorghum, cowpeas and maize on the walo (Agnam Goli). They may face serious labor constraints if their children are small, or if they are alone. Some women who are receiving remittances from absent males can afford to hire labor to help with the farming. Other women chose to stop farming and use remittances to purchase food (Dabia Odedji).

Some women in the surveyed regions have their own rice parcels, but most contribute importantly to the transplanting and winnowing of rice produced on the household plot. Women can supplement their incomes by working on relatives' or neighbors' parcels, for which they are paid 1000 CFA per day or 12 kg. rice (Diobe, Dieri Douga). Payment for their work may be delayed until the rice is harvested. This form of wage labor available to women may be especially important to female household heads, as demonstrated in the following case history.

A. Case History of a Widow

Fatimata (pseudonym) is a woman in her thirties who has been recently widowed. She lives with her four young children, all under the age of 13, and her widowed and sick mother. Her eldest son, who is twelve, goes to school and so cannot help very much with his mother's farming. Fatimata inherited a field in the dieri as well as one in the walo. She does not have the labor to farm the walo field so sharecrops it to a neighbor. The walo field has been poorly flooded in the last few years, however, so she has received virtually nothing from its harvest. She planted her dieri field this year in melons and cowpeas, but the crops received too much water and so rotted, leaving nothing to harvest. Fatimata has no rice parcel of her own but worked on two relatives' parcels in return for a portion of the harvest. She helped with transplanting and harvesting and received from 8–12 kg of rice a day, although she must wait until the harvest is completed to receive her share. She uses this rice both to exchange for other foods and for consumption.

Fatimata has few other sources of income and depends primarily on the help of her relatives. She has already sold all her jewelry and other personal items of value, and owns no livestock. She collects wild foods when she has the time, and works in the village vegetable garden with the help of her children. The family eats only 1–2 kg. of cereal a day, and on some days when there is no grain, they "simply sit with crossed arms."

Women and children like Fatimata and her family are in a precarious position with regards to food consumption. They do not have reliable access to food supplies, and have few options open to them for generating income in the rural areas.

Other female heads of households, however, are in a somewhat more advantageous position in terms of access to land and can follow similar agricultural strategies as do male heads of households. The following case history illustrates this point, as well as the labor constraints under which many small households operate.

B. Case History of a Female Farmer

Talatu (pseudonym) is a 48 year old woman who has been divorced for ten years. She has four grown children, and her three sons are working in the Cote d'Ivoire (Ivory Coast). The remittances they send her are an important addition to her income. Talatu now lives alone and manages her own farming operation.

Talatu farms an irrigated parcel, a 3/4 hectare walo field in Mauritania, as well as owning 4 dieri fields. The walo and dieri fields were inherited from her father. This past year she planted only one of her dieri fields because all her children are gone and she lacks the labor to cultivate the rest. She planted her dieri field in melons, cowpeas and sorghum, but lost her melon and cowpea crops to pests and water damage. She chose to plant sorghum rather than millet this year because of the late rains, but only harvested half of a sack. She weeded this field twice by herself.

To cultivate her rice parcel, she must depend on the labor of others, whether wage or cooperative. She prepared the land herself by hand, and weeded it once

alone. The planting and transplanting, however, was done by a cooperative group of other women and boys taking turns working on each others fields. Of the 12 sacks of rice she harvested, three were paid to SAED, one was given to the people who helped her with the work, and the rest is for her to eat. Talatu used less fertilizer than was recommended by SAED because she could not afford it. She cultivates other crops around the edge of the perimeter including cowpeas, hibiscus, okra, eggplants and tomatoes. A second crop of maize is planted in late October and she consumes her entire maize harvest.

Talatu also grows vegetables and owns 4 goats, 2 sheep and a donkey. She sells the offspring of her animals for money, but must pay to have them cared for with the village herd.

Talatu views the major constraint on her agricultural activities as a lack of time and labor, rather than a lack of income per se. She not only noted the heavy work demands of her irrigated parcel (especially the building of bunds and transplanting), but also the conflicting demands with dieri cultivation. She expressed a desire to hire more labor to help her.

Other women, as mentioned above, have moved out of farming to engage in other economic activities in an effort to supplement family incomes. Petty commodity trading is the most frequent alternative occupation, but women also make crafts, dye cloth, and may own some livestock. The following case study of a fish seller gives some insights into the activities of female traders.

C. Case History of a Fish Trader

Mimouna (pseudonym) is a middle-aged woman who is a trader of fish and vegetables. She lives with her husband, a co-wife, her son's two wives and their 5 children, and 2 children of her married daughter. She concentrates primarily on fish-selling, since vegetable production is largely limited to the cool, dry season. Mimouna buys a large basket of fish every day from the trucks that come out of St. Louis. Although the supply is not completely dependable, variation in supply occurs on an annual rather than seasonal cycle. She primarily sells fresh fish, but may dry unsold portions for sale. The fish she buys are all sea fish and most are called aboye, a fish that is around 6 inches long. She sells fish by the pile, and averages a profit of around 1000-1500 CFA per day, although some days she makes more. Mimouna is willing to trade fish for other products including milk, cereal and cloth, but most of her fish are sold for money.

Mimouna works infrequently in the fields, although her co-resident husband has a perimeter parcel, and both dieri and walo fields. Mimouna says that she was forced out of farming by the poor harvests, and if the rains returned she would continue her trading but begin to farm again. She did plant some cowpeas and melons on her husband's dieri land this year, and can dispose of the produce as she likes. She also helps in her husband's walo fields by scaring birds. Otherwise, Mimouna uses some of the profits of her trading to hire people to help on her husband's fields in her place. She hires women to help plant (at a rate of 500 CFA for 6 hours of work), to help harvest and transport the crops back to the village. Men are hired for weeding; she pays them the same rate as the women. Mimouna does the threshing and winnowing herself, but takes the grain to the power mill

everyday for grinding. Mimouna uses some of her profits to buy condiments for the family, although the husband contributes money as well.

Mimouna has her own irrigated parcel in which she plants rice and maize. She hires people to help with the work as well as laboring herself. She plants her own seeds, and gets fertilizer from SAED. She does not sell any of her rice, but consumes the whole harvest.

The family is relatively well-to-do and Mimouna herself owns two goats. The five adults and 7 children eat 4 kg of grain, and 4 kg of rice per day (almost twice the amount Fatimata's family eats). When asked what the major problem in her village was, Mimouna talked about all of the women who are alone who must work their fields by themselves. The number of such women, she felt, had increased in recent times.

Although these are only isolated case studies, these three women illustrate some of the constraints which rural residents in general are facing, and women in particular.

IV. FOOD CONSUMPTION CONSTRAINTS AND RECOMMENDATIONS

The combination of factors discussed under the heading of Food Consumption Patterns has resulted in an increasing homogenization of the diet throughout the region. Reduced harvests, storage loss to pests, and the necessity of selling or exchanging foodstocks has diminished farm families' consumption of traditional cereals. The narrow range of goods which are imported into most villages is not substituting other foodstuffs for this restricted supply of grains. The decreased availability of wild foods has reduced valuable variety and nutrition in the diet. Wild foods are not being compensated by an increase in the consumption of Western vegetables except during the winter months. Highly variable supplies of fresh milk, and the high cost of powdered milk, have resulted in decreased consumption of milk products. Suspension of food aid throughout the region has eliminated another source of variety and dietary supplements. The high prices of certain foods, such as cowpeas, make them unavailable to many households.

The decreasing variety in the diet which results from these factors also entails a decrease in dietary quality for many families. A number of constraints which have caused this trend, and strategies used to deal with them, are discussed below. Preliminary recommendations including topics for further study are also proposed.

A. Food Shortages

Rural families are faced with food shortages due not only to scarcity of locally-produced foods but also to a limited number of imports.

Compensating strategies

1. Many families have greatly increased their consumption of rice in response to shortages in traditional cereals and to the widespread availability of rice.

2. Increases in rice consumption depend on money to purchase the grain. Most rural families depend importantly on remittances from immigrants. Some villages, however, noted that remittances were less reliable today than they had been in the past.

3. Alternative sources of rural incomes are pursued including agricultural wage labor, fishing, trading, craft and charcoal production, etc. In general, there are few sources of any but petty incomes.

4. Credit for the purchase of foods is limited in most villages. The more well-to-do families in the larger villages may be given as much as 10,000 CFA of credit from local merchants (Agnam Goli), but the poorer families in most need of credit can often not secure any (Meri).

5. Some food or money is borrowed from friends or relatives, but since many people in rural villages are in the same straits, their ability to help is often limited (Meri).

6. Many families have sold off their livestock to acquire money to purchase food. Women have sold their jewelry, clothing and any other items of value to generate income. Many families have nothing left to sell of this sort (Dabia Odedji, Agnam Goli, Ngoui, Meri).

7. Some families reduce the number of meals eaten in a day to conserve food, others simply reduce the amount or quality of food which is served at each meal. Some families may only eat at midday, others eat nothing in the morning (Ngoui, Meri, Agnam Goli, Dieri Douga).

8. Women may attempt to increase their collection of wild foods despite diminished supplies and the need to travel longer distances. The collection of the wild grain paguiri can substitute for the lack of cultivated or purchased cereals.

9. Despite the great decrease in river fish, villagers still exploit this source of protein. The use of finer nets in order to catch the smaller fish is common.

10. Many villages have attempted to start vegetable gardens to provide fresh foods and generate small incomes during the cool, dry season. Vegetable production has been hampered, however, by a lack of knowledge of basic cultivation techniques and simple inputs such as seed.

11. Farmers, especially women, make an effort to maintain the diversity of minor crops (eg. hibiscus, okra, melons) by intercropping them in dieri and walo fields, as well as around the edges and on the dikes in irrigated parcels. This spreads out the risks of inadequate harvests in specific crops.

Recommendations

1. Improvements in the market infrastructure are needed to increase the range of foods reaching rural villages. The promotion of the private sector, which the government has made one of its major goals, requires a better understanding of the constraints under which traders are operating. The distribution of cereals other than rice should be a special focus of investigation to build on Morris'(1986) focus on the parallel market for rice.

2. The necessity of selling very much reduced stocks of cultivated grains to generate incomes for the purchase of other foods works to the great disadvantage of farmers. The promotion of higher value cash crops such as peanuts and sesame would provide them a better rate of exchange, and help safeguard the farm family's consumption of traditional cereals.

3. Distortions in the market, and seasonal variation in prices, could be minimized with the creation of cooperative food boutiques. These could also address the lack of credit for the purchase of food. The boutiques created at Independence are no longer operating in the study regions. Taking the lead from villagers in Mauritania, small-scale coops could be encouraged, working through existing cooperative structures such as village vegetable gardens. These groups could buy cereals and other staples in bulk at times of the year of reduced prices and sell them back to cooperative members at times of scarcity. Simple techniques of pricing and buying could be extended through existing cooperative groups.

4. Efforts must be made to decrease storage losses to pests. The relatively recent changes in storage technologies have not resulted in improvements, but seem to have increased susceptibility to damage. Although the rural residents themselves would prefer better access to insecticides to confront this problem, the widespread use of chemical techniques might involve long-term health

threats. If the use of insecticides is to increase, extension on the proper and safe use of such products is essential. Alternatively, non-chemical methods should be investigated and promoted. Suggestions from other ethnic groups in similar environments (such as storage above cooking areas to take advantage of the smoke, or pit storage) might prove instructive.

5. The decrease in wild food availability could be addressed through reforestation programs, following the lead of the villagers of Abdallah Walo who specifically requested wild fruit trees in their woodlot. These projects might well be directed to women who are the prime exploiters of these products and the most permanent rural residents. A reforestation project in Dounguel has depended on women for the twice-daily watering of seedlings. Trees could also be grown near households where they could benefit from waste domestic water and receive intensive care and protection.

   Replanting of tree and other wild species might well be integrated into village level water conservation projects. Planting wild food trees around vegetable gardens could also be promoted. The trees could benefit from the watering of the vegetables, provide additional food products, act as windbreaks and provide shade which would then prolong the vegetable growing season.

   Replanting activities might well be organized as Food for Work Programs, under the tutelage of the Forestry Service. This would allow the distribution of much-needed food in the short term, while promoting longer-term solutions to the food scarcity problem.

6. The decrease in milk supplies over the long term could be addressed through the promotion of small livestock raising around the household. Although some villagers own livestock which are herded collectively, small livestock kept near the compound could provide milk during periods when the major herds are absent. Such wild human foods as paguiri or oulo could be promoted to serve as forage crops in good years, while reserved for human food during years of shortage.

7. Research could be directed at the minor crops such as melons, okra, hibiscus, etc., focusing on traditional varieties which do not require modern inputs. The planting of these indigenous crops in vegetable gardens in the off-season could also be pursued since they are adapted to a more prolonged season than are Western vegetables, can be preserved using existing conservation techniques, and have a well established market demand. Promotion of herbicide use on irrigated parcels should take into account the threat this could pose to crops planted around the margins.

B. Labor and Time Constraints

Implementation of many of the recommendations made in the previous section depend on the availability of women's labor. Any planned intervention, however, must be sensitive to the already heavy demands on women's time. With high rates of male outmigration women are often left to manage the family's farming operation. Even when migration is only seasonal, some men are migrating during the rainy season, when farm demands are high, leaving their wives and children to cultivate the dieri fields.

Aside from their productive activities, women's domestic labor burdens are high. Women in many households make 5–10 trips to the water source a day, which may require traveling some distance to the river or marigot. When well levels are low during the dry season, drawing water can be especially time-consuming and difficult. Firewood supplies are often limited and may be distant from the villages. Women often go out to gather wood daily, although men and children may sometimes help.

Hand pounding of grain is also very labor intensive. Many women pound twice a day for a total labor investment of at least two hours. If maize has to be processed by hand, it may take up to four hours to fully grind. Even when power mills are available, the initial steps of processing must be done by hand. The separation of the grain from the stalk, the removal of the outer shell and winnowing cannot be done mechanically in these villages.

Cooking is also done at least twice if not three times a day. The infrequency of preparing special foods for weaning or for the sick can probably be explained in terms of the time constraints.

Available labor time is also spent on other activities related to maintenance of the domestic group. Sickness, whether illness of the women themselves or their families, and travel time to infirmaries can make significant demands on women's time. Finally, the need to purchase some foods on a daily basis can consume a significant share of women's time.

Compensating Strategies

1. Women may reduce the time spent in food preparation by cooking fewer meals or preparing less time intensive recipes.

2. Women may obtain either by purchase or exchange, products such as firewood or wild foods which they could potentially gather themselves, thus decreasing their disposable incomes.

3. Women attempt to share the domestic tasks with other women within the household or with their children.

4. Women may withdraw their labor from agriculture, or decrease their input, by hiring wage laborers in their place or simply reducing the time alloted to farming.

Recommendations

1. Many of the grain mills in the villages both cooperative and private, were not operating at the time of the survey due to mechanical failures. The difficulty of keeping these mills running, including getting access to spare parts and fuel, was a common complaint. The women's cooperative of Dabia Odedji had already spent over 80,000 CFA in an effort to fix the communal mill, but it was still not operating at the time of the survey. Mill operators need to be taught some maintenance techniques at the same time as they are taught how to run the mills. Mills which are donated should be sent with a range of spare parts to increase the likelihood of them continuing to run (eg. Tyikkite).

Since women are the primary users of mills, and benefit the most from their operation, there is no intrinsic reason women could not be trained as mill operators.

2. The burden of drawing of water from wells could be alleviated with some simple technologies. Some women prefer to walk further to the marigot than to draw water from the overcrowded well. This can negatively affect health as well as being an inefficient use of the well. Even the supply of ropes and rubber buckets is limited in some villages (Dieri Douga, Gamadji). Simple pulleys could greatly alleviate the labor involved in drawing water.

3. Fuel efficient cookstoves could save on firewood as well as the time involved in collecting the wood. Stoves which can be fueled with crop residues as well as wood have been introduced into other regions of Senegal, and could be extended along with a package of simple domestic technologies.

4. The time lost to sickness should be better understood and addressed. Efforts at extending medical care throughout the rural areas are, of course, being made, but small and isolated villages will probably never be able to support a medical facility. Improvements in drinking water supplies and in the variety of the diet would have beneficial effects on health, but access to modern medicines will probably remain limited in the foreseeable future. The decline in use of the traditional pharmacopoeia is thus premature and unfortunate and warrants closer study.

C. Constraints on Female Farmers' Activities

Although the food consumption survey did not focus on women's productive activities exclusively, it did generate the indication that an increasing number of rural women are the sole providers for their households. Furthermore, women's ability to generate incomes is presently limited, and yet potentially crucial to the standard of living in the rural areas. Their access to agricultural lands, both rainfed and irrigated is also of potential interest to future research and extension programs, as are the minor crops which are primarily the domain of women. These trends and relationships deserve further study and confirmation.

Recommendations

1. If women are increasingly responsible for agricultural decision-making (whether or not as household heads), and assuming they may be operating under somewhat different constraints, and with different goals than male farmers, their activities and problems should be directly addressed. The lack of labor, for example, may be a more critical limiting factor for female households heads than for males. This implies the need not only for further study of women farmers of the region, but extension efforts directed specifically at women.

2. The extent of women's access to irrigated parcels in village perimeters is also unclear. If individual women cannot marshall enough labor to handle a plot by themselves, the possibility of giving plots to groups of women to farm cooperatively should be considered. This has been successfully implemented in the delta regions of Senegal. Women's access to dieri and walo lands also needs further investigation, especially as changing environmental conditions are transforming some of the land use systems in the region.

3. Any improvements in vegetable gardens, most of which are farmed by women, and in yields of traditional sauce crops would directly benefit both the diet and women's income-making potentials. Research and extension efforts should focus on these activities.

APPENDIX A

TOPICS OF INQUIRY FOR CONSUMPTION SURV

I. GENERAL INQUIRIES ORIENTED TO GROUPS OF WOMEN

A. MARKETS

1. Food prices
2. Location of Market
3. Periodic or permanent

B. FOOD PURCHASES

1. Items purchased daily - quantities
2. Items purchased less frequently

C. BARTER

1. Food exchanged
2. With whom
3. Frequency

D. FOOD SHARING

1. Who is sharing food
2. What is shared
3. How often is it shared

E. FOOD DONATIONS

1. Food Aid (government or non-government agencies)
2. What amounts
3. How often? (how many times in last 12 months)

F. GATHERED FOODS

1. What kinds, found where
2. How often
3. Availability
4. Preferences
5. Sale

G. STORAGE AND PRESERVATION

1. What is stored
2. Types of storage
3. How long ago were the stores depleted
4. Major cause of losses during storage

H. SEASONALITY OF CONSUMPTION

1. What foods are in short supply this season
2. Coping Strategies of the Household
   a. substitute foods
   b. selling gold, jewelry, boubou
   c. cutting down on meals - present number of meals consumed
   d. off-farm employment
   e. other sources of income to purchase food
   f. credit - borrowing food from merchants
      (local merchant or merchants in other towns or villages)
   g. borrowing from relatives or friends

3. Disease prevalence
   a. prevalence of different diseases (esp. diarrhea)
   b. infant mortality - deaths to births
   c. treatments

4. Water Source
   a. variation by season
   b. If well, changes in water level

I. TYPES OF FOOD PREFERRED

1. What is the preferred grain meat

2. What are the desirable qualities of the cereals Ease of preparation, texture, color, ingredients combined with

3. Why do they prefer some grains over others

4. What foods would they eat more of if they could afford it

J. FOOD PREPARATION

1. List of major dishes and their ingredients What eaten during each meal 24 Hour recall

2. Snacks

3. Preparation techniques
   a. when is the food prepared
   b. time spent gathering fuelwood water
   c. quantities of food consumed (local measures, per person)

4. Access to grinding mill Cost, How often If not, how much time does it take to pound the grain?

K. FOOD HABITS

1. Food taboos
   Religious, pregnant women, children

2. Weaning foods
   Foods for children of non-lactating women

3. Specialty foods
   Foods for women just after birth while breastfeeding

4. Breastfeeding
   Duration
   Practice of weaning - when and how?

5. Who cares for the children when women are working

L. WOMEN'S FARMING ACTIVITIES

1. Access to land
   Owned or borrowed
   Irrigated/ rainfed/ recession
   Environmental effects on access to land

2. Crops grown
   Grain, okra, vegetables, minor crops
   Have crops changed over time (e.g. still grow indigo, cotton,etc.)

3. Consumed/marketed

4. Problems
   Effects of male outmigration on women's farming activities

5. Desired interventions

6. Livestock ownership
   - what animals
   - products consumed/marketed
   - animals consumed/marketed

M. MARKET GARDENS

General Inquiries

1. How organized
2. Seasonality of crops grown
3. consumed/marketed - where marketed
4. source of water
5. constraints

II. INTERVIEWS CONDUCTED WITH INDIVIDUAL WOMEN

(Note: Try to interview widows and divorced women as well as married)

A. CHARACTERISTICS OF MEMBERS OF THE HOUSEHOLD

1. Age
2. Sex

B. OCCUPATION OF HOUSEHOLD MEMBERS

1. On farm
2. Off farm - seasonality
3. Migration patterns in and out of households

C. EDUCATIONAL LEVEL OF HEAD

D. ACCESS TO AGRICULTURAL LAND
For both males and females

E. COPING STRATEGIES OF THE HOUSEHOLD TO DEAL WITH FOOD SUPPLIES

1. Sources of income to purchase food
2. Off farm employment of women
3. Adjustment made in number of meals prepared
4. Selling of household items or personal items
5. Substitute foods
6. Credit - or relationships established with merchants
   Terms of credit
   Local merchants or in other towns or cities
7. Borrowing from relatives or friends

III. PERSONAL OBSERVATIONS

1. Cooking activities
2. Marketing activities
3. Water gathering activities
4. Fuelwood
5. Gathering wild foods

SUMMARY OF RESULTS OF THE CONSUMPTION SURVEY
SENEGAL RIVER BASIN

VILLAGES:	BOKI_DIAVE	DABIA_ODEDJI	AGNAM GO' I
	Pop: 2110, 1/2 Soninke, 1/2 Pulaar	Pop: 2671, Halpulaar	Pop: [illegible]4, Halpulaar
A. MARKETS			
Location		None, but a shelter with some goods or go to Boki Diave, 2.5 km.	Small market w/shelter.
Type of market (periodic, etc.)	Rice: 200/kg. Maize: 500/kg. Same, Souna, Fellah: 125/kg. Fish: big 150-200/fish. Meat: 650/kg. for beef. Sugar: 375/1 kg. Tea: small glass 200. Oil: 450/liter.	Rice: 200/kg. (after harvest only 250/moud). All other grains same price: 500/moud (fellah, same, souna, maize). Oil: 450/l. Sugar: 400/kg. Tea: 500/100g. Cowpeas: 500/kg. Pode: 400/moud. Meat: beef 5-600/kg. Goat and sheep:700/kg. Fresh fish: heap of 3-4-100; dry- 1)tambaje-200/kg. 2) kobo-250/kg. 3) gajebeur-1000/kg.(big).	Rice: 180/kg. Other grains: 125/kg. (now only sorghum). Cowpeas: 500/kg. Oil: 450/l. Sugar: 375/kg. Tea: 1/2 small teaglass 100. Fish: fresh-pile of 3 small-100, large basket-3-3500.Watermelon seeds:150/kg Peanuts: 400/kg. Dry fish: pile of 3=100; large-750/one. Salt: 125/kg. Red peppers: 10 small. Cube maggi: 20. Dry onions (1 ball): 15. Manioc: 25/tuber. Powder milk: 900 CFA per kg.
Food prices			
B. FOOD PURCHASES			
Items purchased daily	Meat, fish (dry & fresh), soured milk, sugar, tea, oil.	Rice, onions, tomatoes, pepper (red & black), maggi cubes, oil, vinegar, meal for mafe, potatoes, sweet potatoes. All available now.	Rice, sorghum, pepper, oil, maggi, fish, onions, canned tomatoes, pepper.
Articles purchased less frequently (2-3 days)	Cereals: 7000um for 100 kg. All imported.	Most food purchased daily.	Most food purchased daily. Some bulk purchases of grain.
C. BARTER			
Food exchanged	Rice for milk.	Cereals for oil, etc. Cereals for milk - lots of livestock.	Cereals for milk, lalo, even w/ boutiques. Milk/cereal-1:1. Lalo/cereal-1:1.
With whom	Peuhl-exchange rate 1:1.	Within village.	Peuhls bring in milk. Market women exchange others.
Frequency	Frequent but nothing else is exchanged.	Very frequent.	Very frequent - as long as grains in stock exchange for sauce ingredients.
D. FOOD SHARING			

	BOKI DIAVE	DABIA ODEDJI	AGNAM GOLI
Who		No. Everyone is in the same situation.	Friends or family.
What		Leftovers.	All food.
How often		Occasionally give leftovers to the needy.	Some have "regular" arrangements - lend to each other to tide over gaps in remittances.
E. FOOD DONATIONS			
Organizations		None.	None now - used to receive sorghum, maize.
Most recent		3 years ago.	3 years ago.
Frequency in last year		0	0
F. GATHERED FOODS			
Kinds and where found	Oulo, mourtodes, jaabe, jomba (small fruit ready in Jan.-Feb.) No other wild leaves.	Mourtode, jaabe, guidijile, dayril, tabe, oulo, quinqueliba, eeri, gawdi, lalo balli.	Mourtode, jaabe, pagiri, guidijile, oulo, quinqueliba.
How often	Greatly diminished w/drought. Mourtodes too far away to gather.	Mourtode and jaabe found 3 km. from village - collect often in season. Pagiri not many gather. Some buy. Hunger food. Oulo or lalo everyday. Quinqueliba frequent.	Frequent - some gathered, some purchased.
Availability by season	Oulo now before haco ready.	Prefer mourtode & jaabe. Baobob products are all imported-none here. Many gather just for consumption, others bring in for sale.	Mourtode & jaabe almost ready (don't make soup, just eat fruit). Pagiri now-diminished with drought.
Preferences		All wild foods are liked. Seemed quite important to this village. All come into village even if they don't gather themselves.	The fruits are valued. Lalo from baobob imported from Dakar area, eaten for couscous. Pagiri collected by young girls or if hungry.
Sale		Some mourtode, jaabe, pagiri, oulo, quinqueliba sold.	Peuhl bring guidijile in for sale. Oulo not around here. Women near the river bring to sell.
G. STORAGE AND PRESERVATION			
Products stored	Millet, sorghum, cowpeas.	Millet, sorghum, rice.	All cereals: millet, sorghum,

	BOKI_DIAVE	DABIA_GOEDJI	AGNAM GOLI
			cowpeas, watermelon seeds.
Types of storage		Sacks-do this if harvest is small. Granary (sakh) has less insect problem. Left on stalk (no bancos here).	Put in square building or room. Stored on wood or shelves.
When stores depleted	All gone 2-6 mos. ago.	All are gone now. Most finished in June. In past, stores lasted up to 3 years.	Varies: 3-5 mos. ago. If have to exchange for other foods lasts only 1-5 months.
Causes of loss		Mice, termites, other insects. Big problem-no powders. Some have mouse traps.	Cowpea weavils, termites. Big problem. No powders. Just swap if find termites.
H. SEASONALITY OF CONSUMPTION			
1. Foods in short supply in	Fish both dried & fresh comes from coast everyday. Prices lower in dry season than now (eg. grains as little as 50-75 per kg.) or rice after harvest 250/moud for paddy while now 350. Hungry season: June-Dec. waiting for harvests.	Vegetables. Little seasonal variation. Can get potatoes and tomatoes even now.	Hungrier season June-Oct. when waiting for harvests. Now everything in short supply including vegetables, grains. Millet depleted-now only sorghum. Veg.: now only manioc, peppers.
2. Coping with shortages Substitute foods		Decreased milk consumption (used to drink 4 times/day). Especially lacking for children.	See meals.
Selling personal items		Yes - jewels, clothes, etc. If need money must find something to sell.	Yes - women have sold off a lot of jewels, pagnes, cloth.
Number of meals reduced		Just drink coffee for breakfast. If have big lunch skip dinner.	Skip meals. Often breakfast but also dinner (always eat at midday).
Off-farm work		Remittances.	Remittances important but less regular nowadays.
Other income for food purchase	Dyeing, making clothes, trading.	Dyeing, sewing, embroidery, market gardens, mats.	Women do small commerce, some embroidery (no longer dye-lack of materials).
Credit (borrowing food from merchants)	Yes, but not everyone. Some can borrow up to 1 sack, others nothing. No interest.	Yes, frequently. Pay back with remittances or harvest. Can pay back w/money or grain, merchant holds till price goes up. No interest.	If well-off get 5-10,000 for a month, if not 2,000. Pay back when remittances come or after harvest. No interest.

	BOKI_DIAYE	DABIA_ODEDJI	AGNAM_GOLI
What merchants	Local merchants.	Local (chief is a merchant who gives credit to many).	In the village.
Borrowing from friends/relatives			Yes, money and food.
3. Disease types	Malaria, measles, fevers.	Diarrhea, malaria, measles, jaundice, stomach and headaches, teeth & ear problems. A disease they haven't seen in 60 yrs. has reappeared in neighboring village. Cough a lot, lots of black bumps. No name given.	Coughs, diarrhea, measles, apolo, malaria.
Diarrhea prevalence	Winter have worse problems, some in summer.	Diarrhea at weaning but always a problem w/children.	At weaning and at change of seasons. Haco and gniri can cause diarrhea in children.
Treatment for diarrhea	Go to dispensary. Used to treat w/wild foods in old days and lots of kids died.	Go to medical center. Don't use baobab, etc.	Go to medical center in Sewul (3 km. away).
Other treatments	Go to infirmary.		Honey for coughs. Mourtodes for stomach aches. Jujubes for colds.
4. Water source		3 public wells (also private).	1 working well.
Seasonal variation		Always water but takes more time because use more.	Great drop in dry season - major constraint.
Changes in well level		None	
I. FOOD PREFERENCES			
Meat/Fish	Prefer beef over others-better supply.	All liked equally well.	Meat preferred-eat mostly fish.
Cereals	All liked - no marked preference.	All.	Prefer millet (esp. old people, young prefer rice). Same
next.			
Qualities desired in cereals			Taste.
Why some preferred over others			Souna preferred because goes well with dried fish (what they eat mostly). Same and fellah go better w/fresh fish/meat.
Food preferred if more money			Mafe w/meat, rice, vegetables, (Note: "Urban" foods not local cereals).

	BOKI_DAIVE	DABIA_ODEDJI	AGNAM_GOLI
J. FOOD PREPARATION			
Major dishes and ingredients		Mafe-rice is kept separate from sauce. Some w/okra, peanuts, tomatoes, etc. Ruiz=very finely ground grain w/sugar & milk. Liquid.	Rice w/condiments, couscous, gnirl, gossi.
Meals-what eaten and quantities (1 household) yesterday for: Breakfast	Sombi (rice, sorghum, millet, maize) w/sugar & milk, or leftovers from couscous of night before.	Coffee, sugar, powdered milk, bread.	Coffee, milk, sugar, bread if can afford, or quinqueliba if no coffee. If not, couscous w/meat or milk if can afford. Otherwise just with water & sugar.
Lunch	Rice w/fish, meat, etc. Couscous w/meat eaten infrequently.	Rice w/oil, tomatoes, fish or meat, red & black peppers, maggi, oil, vinegar. Potatoes and sweet potatoes.	Gniri (any cereal) or rice with meat or fish (dry or fresh).
Dinner	Couscous (maize, fellah, same, pagiri) w/meat or fish, haco also w/milk.	Couscous (any grain. Can buy already milled 250/kg. for all), w/haco, cowpeas, pode, peanuts, and either meat, dry fish or fresh fish.	Couscous (mostly same now), w/fish or meat, haco, peanuts, jalo, oil, etc. Gossi if less money available. Add milk or sugar if can afford (made of maize or rice).
Snacks		Candies, biscuits, baignet, milk.	
Preparation, techniques, when	Women take turns cooking if several in the house. Divide grain in two: hand pound morning, sift & use flour, take cracks to mill for evening.		Pound once in the morning. Takes 3 processes: 1)separate grain from stalk; 2)from chaff; 3)into cracked or flour.
Time spent getting fuelwood		Can still find wood around village not far. Some buy if no time.	Women, children & some men. Bring back a basin lasts 4-5 days, takes most of the day. If affordable, buy a cart load 1500 CFA.
Water		5 public wells and some private. Go twice a day, get 5-6 basins for big families. Women & young girls.	7 wells but only 1 works. In dry season long waits or get up early when recharged.
Amounts, local measures (per person)	Large family (5 married men, wives, kids): 8kg. rice for breakfast & dinner.		Eg. 2 adults, 6 kids, per day: 1.5 kg. rice, 2 kg. other grains.
4. Access to grinding mills	Here.	2 mills: public mill broken.	1 private mill.

	BOKI DIAVE	DABIA ODEDJI	AGNAM GOLJ
		Private also breaks sometimes.	
Cost	75 CFA/moud of cereals but maize 100.	Public: moud 60 CFA (if gas/oil expensive 65), maize 75. Private: moud 75, but maize 100.	125 CFA/moud for same, souna. 150 CFA for maize.
Frequency			If can afford once a day. Many women do by hand.
If by hand, time spent pounding	If no money, pound 1-2 hrs/day.	About 2 hrs. From 10-12 am.	At least 2 hrs., even if use mill must do first 2 steps manually.
K. FOOD HABITS			
1. Food taboos			
Pregnant women	Crocodile meat. Eat no special foods.	Rabbit meat: (bloody meat to cause bleeding at delivery. Crocodile meat: causes sexual problems in child. But not relevant now.	
Children	Eat everything-no taboos against eggs, tea.		None.
2. Weaning foods	Ruiz, eggs boiled in water.	Told at medical centers to give weaning foods. Milk, rice. Used to start at 2 yrs. w/adult foods.	Ruiz, milk, gossi (ground very fine).
3. Other foods for women who have just given birth	Soups w/chicken or w/meat and oil, bouillie. Return to work after 2 mos.	Used to just eat everyday food. Now some women took a course and told to eat meat, milk, finely ground foods. Gossi (rice). Also hot water w/goye (traditional fruit.) Aadi root of tree that restores energy. Meat (chicken), milk.	Meat if money. Otherwise gossi and drink hot water.
Foods for children of non-lactating mothers		Used to give a wet nurse. Also fresh milk. Now give ruiz fed with bottle.	Same as weaning foods.
Foods for sick		Same as weaning foods.	
L. Breastfeeding			
Duration	18 months.	18 months.	18 months.
How weaned	Start supplementing 6 mos.	Bruskly but with supplementary	At 6 mos. give weaning foods or

	BOKI_DIAVE	DABIA_ODEDJI	AGNAM_GOLI
		foods.	little bits of adult food.
5. Care of children while women work		Older children.	
L. WOMEN'S FARMING ACTIVITIES			
Access to land		Most women just help on husband's fields and care for smaller intercropped plants.	
Owned/borrowed		If widowed use husband's land (or if he is gone). If divorced, family land.	Husband, or from families.
Irrigated/rainfed/recession		Dieri, walo.	Dieri, walo. Most women don't have own fields. Only special circumstances but rare nowadays.
Changes with drought		Effects of outmigration.	Dieri fields very restricted. Some no longer plant. Women working more.
Crops grown - grains			Same as men. Dieri: souna, cowpeas, pode, foleri, kanje. Walo: same, cowpeas, maize.
Vegetables		Lettuce, cabbage, beets, carrots, onions, potatoes, tomatoes, hibiscus, kanje, peppers, manioc.	1984: cabbage, potatoes & others. Whatever seeds they have.
Minor		Walo: pode, kaye, foleri, cowpeas.	
Changes in crops grown	Used to grow more indigo-now purchase dyes.	Used to grow cotton & indigo-still card & spin cotton but brought in. Some wild indigo gathered.	Women growing grains w/absent men.
Consumed/marketed			Both.
Changes in women's farming with outmigration of males		Some women do the work, others hire labor w/remittances, others just buy food.	Widows, divorcees or men are gone must cultivate dieri & walo on their own w/help from children.
Desired interventions			Women's Group (Habi Musa Kunjo, President.) Started dyeing
but			lack of materials & time (men

	BOKI_DIAVE	DABIA_ODEDJI	AGNAM_GOLI
fields).			wanted them to work in Need help.
Livestock, ownership, which animals		Women own goats, sheep, cows.	Women own chickens,goats,sheep.
Products consumed/marketed		Milk consumed and sell surplus.	Used to have enough milk to consume and sell. Now consume all and still must buy milk.
Animals consumed/marketed		Sometimes sell sheep if need money, or if visitor, or for family occasionally.	Sometimes eat if no other meat, kill for a guest, sell if you need money.
M. MARKET GARDENS			
Organization	A large 10 ha. veg. garden under construction funded by emigrants. Putting up fence now, buying a pump.	Small garden enlarged this year. 150 women on the list but only room for about 30 parcels. All cooperative but each woman assigned own parcel. Grow one vegetable per parcel.	Started 1984 (112 people, made 200,000 CFA). Both cooperative and private parcels. No garden last year due to water problems and time.
Seasonality of crops grown		All did well except cabbage didn't form head. Plant in nursery and then transplant. Each woman tends her own plot. Now preparing plot. Before too much work in dieri & rice.	Planted around Nov. 1984. Not yet planted this year.
Consumed/marketed		All harvest sold. If member wants veg. she must buy. Certain women assigned to sell veg.	Coop produce sold while private mostly consumed.
How marketed		Sold here or in Boki Diave.	Here.
Source of water		Garden moved to be next to well. Water twice a day (4 basins in all per parcel.)	Well - hand drawn. Water lacking.
Constraints		Need a fence, water, seeds (buy in Thilogue).	
General observations Areas of research	Women hired for rice work 1,000 CFA for 8-2, same for men and women. Transplanting,winnowing women given 12 kg. rice or 1000 CFA/day. Given share of harvest if they help.	Put 3 basins of manure on each parcel. Given insecticides one year-grasshoppers a problem. Made 7,500 in 1984, spent 45,000 on fence but no garden 1985. This year moved next to well	Women busy in walo during this season. Water drawing time consuming. Plan to plant this year but not yet started.

SUMMARY OF CONSUMPTION SURVEY

	TYIKKITE	DAKA_OUROULBE	BODE_LAO	GAMADJI
A. MARKETS				
Location	No permanent market. Only 1 saleswoman works out of her house. Women buy food at Boumba.	No market, buy food every 2-3 days at Gollere.	At center of village-daily between 8-13:30	At center of village under a tree.
Type of market			Permanent.	Permanent, between 9-13 hrs. daily.
Food prices			Dry fish: 200 CFA/kg. 2 for 50 CFA. Cowpeas: 50 CFA/small tea glass. Canned tomatoes: 25 CFA/ coffeespoon. Oil: 500 CFA/l. Sorghum: 175 CFA/andan. Paddy rice: 125/andan. Soap: 175/500 g. Matches: 25/box. Bread: 100/400 g. Dry pepper: 10/pile. Follere: 5/pile. Cake: 5/piece.	Okra: 25/pile. Cube maggi: 25/pile of 3. Dry Fish: 3 small for 25 CFA; 2 big for 50 CFA. Maize: 500/mould. Melon seeds: 50/pot. Sorghum: 125/kg. Cowpeas: 150/pot. Fresh maize: 100/pile of 4. Oil: 425/l. Rice: 175/kg. Sugar: 375/box.
B. FOOD PURCHASES				
Items purchased daily	Oil, cereals, condiments, maggi cube, onions, fresh or dry fish.	None.	Oil, millet or sorghum, onion, dry or fresh fish, cube maggi.	At this season: millet or sorghum, condiments, cube maggi, onion, dry or fresh fish, milk.
Articles purchased less frequently (2 or 3 days)	Rice, bread.	Oil, millet, sorghum, rice when needed, fresh or dry fish, tomatoes.	Rice, if can afford.	Rice, oil.
C. BARTER				
Food exchanged	Millet, sorghum for sour milk (at harvest).	Sour milk for millet and sorghum.	Millet or sorghum for sour milk. Millet & sorghum sold to buy condiments.	Cereals for sour milk.
With whom	Peuhl women.	The inhabitants of Gollere.	Market sellers. Peuhl women.	Peuhls.
Frequency		Every 2-3 days.	Every day until stocks	Every day until stocks are

	TYIKKITE	DAKA_OUROULDE	BODE_LAO	GAMADJI
			are depleted.	depleted.
D. FOOD SHARING				
Who	Relatives, friends.	Neighbors.	Relatives and friends.	Relatives and friends.
What	Cereals.	Cereals.	Cereals.	Cereals.
How often	Variable.	Variable.	When needed.	Rare because everyone is poor.
E. FOOD DONATIONS				
Organization	Government, CIMAD, and PPNS (for children under 5 yrs.)	PPNS	PPNS (at Mare Lao).	Government (even when it came it reached few people.)
Quantities	Powdered milk, oil, sankal.	Oil: 1/4-1 l/child. Flour: 4 kgs/child. Powdered milk: 1.5 kgs.	Flour: 7-8 kg. Powdered milk: 4 kg. Oil: 1 l. Sankal: 8 kg. Cerelac: 8 kg/child.	
Most recent	State-CIMAD-nothing for 2 years.	Nothing from govt. in 2 years.	PPNS delivers monthly. Govt. nothing for more than 1 year.	Five years since received grains. 2 years since corned beef.
Frequency in last year	PPNS once a month.			
F. GATHERED FOODS				
Kinds & where found	Mourtode, Jaabe, Paguiri, Niandane, Dadji (when swamps present).	Mourtode, Jaabe, Niandane.	Mourtode, Jaabe, Niandane, Paguiri.	Paguiri, Guidjile, Mourtode, Jaabe, Tuperre.
How often			When available.	When available.
Availability by season		Cool dry season.		
Sale	Sell mourtode & jaabe, also consume.		Sell & consume mourtode & jaabe.	Sell and consume mourtode and jaabe.
G. STORAGE AND PRESERVATION				
Products stored	Grains: sorghum and millet.	Grains: sorghum and millet.	Grains: millet, sorghum and paddy rice.	Grains.
Types of storage	Stored as seed. Treat with HCH when available.	Stored in Gollere in granaries loaned by friends.	Rice in bags. Millet and sorghum: sacks or stalk. Treat with HCH when available.	In bags in granary or banco.
How long stores lasted	2-3-4 months.	6-12 months when cereals are available	3-5 months.	Rice: 1 month. Millet-

	TIIKKITE	DAKA_OUROULBE	BODE_LAO	GAMADJI
		in the market. Sell 2-3 sheep and buy enough grain for several months.		sell to purchase condiments.
Causes of loss	Insects, mice.		Insects, rodents.	Insects, rodents.
H. SEASONALITY OF CONSUMPTION				
1. Foods in short supply in this season	Cereals, vegetables.	Cereals.	Cereals, vegetables.	Cereals, vegetables.
2. Coping with shortages				
Substitute foods	Reduce the quality of meals. For example, gossi.	Exchange cereals for milk.		Gather wild foods.
Selling personal items	Yes.		Clothing, jewelry.	Yes.
Number of meals reduced	2 or 1.		Reduce number and quality of meals.	Reduce number of meals: 2 or 1 a day.
Off-farm work			Emigration from time to time.	
Other income for food purchase	Sell small livestock.	Sell livestock.	Sell livestock.	
Credit (borrowing food from merchants)	Yes, but limited to less than 2500 CFA.		Credit limited to one month or until the village harvest.	Limited-loan only to the rich.
What merchants	Village.			Village.
Borrowing from friends/ relations	Yes, if they can lend. Can go eat at neighbors on occasion.		Yes, if they can.	Yes, if they can.
3. Disease				
Types	Diarrhea (especially when the milk from food aid arrives).			Diarrhea, malaria.
Diarrhea prevalence	Malaria during rainy season.	Diarrhea present all year long.		Frequent with the floods.
Treatment for diarrhea	Go to dispensary at Boumka.	Dispensary. Bark of guinjile (but children dislike because bitter		Dispensary at N'Dioum or sellers of medicines

	TIIKKITE	DAKA_OUROULBE	BODE_LAO	GAMADJI
Other treatments	Dispensary but few medicines.			
H. Water				
Source	Marigot for household and washing, well for drink (lack equipment for drawing water).	Ponds in rainy season. River the other seasons.	4 wells in village: 1 doesn't work, 2 have water but level lowers very quickly, 1 hydraulic well not yet working. Lack water drawing equipment; no pulleys, bags & ropes rare.	Well, marigot (comes & goes).
Seasonal variation				
Changes in well level				
I. FOOD PREFERENCES				
Meat/fish	Sheep.	Sheep.	All meats eaten.	Sheep.
Cereals	Millet, sorghum.	Millet, sorghum.	Eat what one has.	White same.
Qualities desired in creals	Give both flour & cracked grain so more economical.	Taste.	Economical.	Same is more economical (flour & cracked grain). Can make several dishes.
Why some preferred over others		Accustomed to eating sorghum & millet.		Taste.
Food preferred if more money	Rice with fish or with meat at mid-day, couscous at night.	Gniri with meat or rice with mutton for lunch. Couscous & meat for evening.	Rice with fish or meat at lunch. Couscous and meat in the evening.	Couscous, gniri with white same, rice occasionally.
J. FOOD PREPARATION				
Major dishes and ingredients	Gniri: Millet or sorghum with fresh or dry fish, oil. Couscous with haco & melon seeds with cowpeas or just with water if lack ingredients.	Gniri: Millet or sorghum. Dry or fresh fish. Maggi, tomatoes, butter from cow or goat milk. Lakh: millet or sorghum (flour made into balls) and sour milk.	Gniri Bouna (w/fish). Gniri Kwasam (w/sour milk)-same as Lakh.	Gniri, rice with fish, couscous with haco, mourtode, cowpea or melon seeds. Eat meat only at Tabaski, baptisms and if old animal dies.
Meals				
What eaten and quantities (1 household) yesterday for:				
Breakfast	Coffee & leftovers from dinner. Couscous	Coffee with goat's milk & couscous. Tea	Leftovers from previous night. Couscous	Coffee, tea or quinqueliba & leftover couscous from night

	TIIKKITE	DAKA_OUROULBE	BODE_LAO	GAMADJI
	and haco or with milk or water. Gossi with sugar & milk or just milk.	at 10 a.m.	with milk or haco. Coffee or tea. Bread from time to time.	before.
Lunch	Gniri with fish. Rice with fish if can afford.	Gniri, Lakh, rice with fish (once a week) or when there is a visitor.	Gniri bouna, gniri kwasam, rice with dry or fresh fish.	Gniri, rice & fish. If no grains, eat haco with mourtode and melon seeds.
Dinner	Couscous with haco or with sour milk or with just salt water.	Couscous & milk, couscous & meat.	Couscous & haco or with dry fish or with milk.	Couscous with haco & beref or cowpeas or with salt water if nothing else available.
Snacks	Mourtode, Jaabe.	Mourtode, Jaabe.	Mourtode, Jaabe.	Mourtode, Jaabe.
Time spent getting fuelwood	Gather wood in dieri. Go for 4 hrs. every 2 days. In dry season gather cow dung near village.	Less than 1 hour. Place to gather wood is close.	8-12 am every 2 days.	9-12 am every 2 days.
Water	Marigot is 2 km away.	Ponds close by but river is distant (1-5 hrs.)	Morning.	2 hrs. to the marigot.
4. Acess to Grinding Mills				
Where	Mill given by CIMAD; broken for 8 months.	Mill at Gollere.	Private mill.	Mill given by Mimouna Kahn (former Minister of Social Development).
Cost	75 CFA/moud.	30 CFA/andar.	70 CFA/moud.	50-70 CFA/moud.
Frequency	Rare.	Every 2-3 days.	Rare.	Broken for 5 months. Operated for 3 years.
If by hand, time spent pounding	2 hours.		More commonly hand-pound, 3 hrs./moud.	
K. FOOD HABITS				
1. Food taboos				
Religious	Pork.	Pork.	Pork.	Pork.
Pregnant women	Eat everything.	Eat everything.		Eat everything.
Children	Eat everything.		Eat everything.	Eat everything.
2. Weaning foods	Sour milk.		Regular food & sour	Adult food, bouillie & sour

	TIKKITE	DAKA_OUROULBE	BODE_LAO	GAMADJI
			milk.	milk.
3. Other foods for women who have just given birth	Bouillie for 2 wks.	Bouillie, meat soup kill animal for this occasion.	Bouillie, gossi, soup if can afford.	Coffee, bouillie, haco, gossi, guidjile.
Foods for children of non-lactating mothers	Sour milk, bouillie.	Goat's milk and sugar.	Sour milk.	Sour milk, bouillie.
Foods for sick	Bouillie.	Bouillie.	Bouillie.	Bouillie.
4. Breastfeeding				
Duration	18 mos.	24 mos.	18 mos.	18-24 mos.
How weaned	Take child to Marabout.	Just stop one morning, put cow dung on breast.	Go to Marabout. Put cow dung on breast.	Marabout.
5. Care of children while women work	Older sister or carry on back.		Older sister, grand-parents or carry on back.	Older sister, grandparents or carry on back.
I. WOMEN'S FARMING ACTIVITIES				
Access to land		No fields for women. Men only have dieri fields.		
Owned/borrowed	Inherit lands from father or husband. Also borrow.		Inherit land from husband or relatives.	Inherit, cooperative member.
Irrigated/rainfed/recession			Irrigated: women can belong to the group. Walo: inherited.	Irrigated: as cooperative member. Walo: inherited.
Changes with drought	Walo land rarely flooded.		Little walo land flooded.	Great reduction in flooded areas.
Crops grown				
Grain	Millet, sorghum, maize.		Millet, sorghum, maize, rice.	Cereals (millet, sorghum, maize, rice.)
Vegetables	Cowpeas, melons, sweet potatoes, follere.		Cowpeas, melons, sweet potatoes, follere.	Cowpeas, melons, sweet potatoes, follere.
Consumed/marketed	Cereals both eaten/sold.		Both eaten & sold.	Sell grains & vegetables.
Problems	Small size of irrigated parcels. Rapid deple-	Small size of irrigated parcels.	Small size of irrigated parcels. Rapid deple-	Rapid depletion of stores. Small size of irrigated

	TIKKITE	DAKA OUROULBE	BODE LAO	GAMADJI
	tion of stocks.		tion of stored grains (for food & purchase of condiments).	parcel.
Changes in women's farming with outmigration of males	Women responsible for parcels.		Women responsible for men's work as well as their usual tasks.	Assuming all responsibility.
Desired interventions	TOOLS FOR EASING THE BURDEN OF WOMEN'S WORK, EG. MILLS.			
Livestock Ownership				
Which animals	Few animals left. Most gone for sale or due to drought. Some fowl, goats, sheep.	Sheep, goats, fowl.	Fowl, sheep, goats, but few.	Fowl, sheep, goats, but very few.
Products consumed/marketed	Milk.	Milk.		Milk.
Animals consumed/marketed	Sell animals when necessary. Tabaski.	Animals sold when necessary.	Animals sold when necessary.	Sell animals.
H. MARKET GARDENS				
Organization	Have a president and treasurer, 300 members each with own plot. Begun 3 yrs. ago.	Women belong to PPNS garden at Gollere.	Garden supervised by CIMAD. Men belong as well. They made the fence & the plots. 5 groups of women for watering. Begun 1985.	Started 8 yrs. ago under SAED then CIMAD. Garden divided into 6 sections. Each section tended by a group.
Seasonality of crops grown				Cool season.
Consumed/marketed	Each woman chooses whether to sell or not.		Each group gives part of produce for the fund, the other portion is eaten.	Both consumed & sold.
How marketed	Sell in M'Boumba.		In village.	Sell at N'Dioum & in village.
Source of water	River: water by hand.		Marigot.	River.
Constraints	Water, wood for fence.		Water, equipment.	

SUMMARY OF RESULTS OF THE CONSUMPTION SURVEY
SENEGAL RIVER BASIN

VILLAGES:	NGOUI	MERI
	Pop: 652, Mostly Halpulaar, some Peuhl, Maure. Mostly fishermen (Chubalo).	
A. MARKETS		
Location	None. 2 boutiques (Pete market 3 km.)	20-30 women under small shelter, 5 boutiques.
Type of market (periodic, etc.) Food prices	Rice: 200/kg (100 for paddy). Same: 100/kg. Fellah (no souna available). Cowpeas: 200/kg. Oil: 500/l. Peanuts: 100/kg. Pode: 150/kg. Maize: 100/kg. Sugar: 400/kg. Tea: 6000/kg. Fish fresh: 5-6: 100-200; dried-5:100. Buy in Pete: souna: 15,000/100 kg. Maize: 15,000/100 kg.	Rice: 200 (after harvest paddy rice=300/moud) Same, fellah=450/moud. Ground maize: 200/kg. Cowpeas: 1000/moud. Watermelon: 400/moud. Oil: 500/l. Sugar: 400/kg. Tea: 4000/kg.
B. FOOD PURCHASES		
Items purchased daily	Rice, oil, maggi, pepper, laurel, tomatoes, onion, some buy cereals daily.	
Articles purchased less frequently (2-3 days)	Some cereals.	
C. BARTER		
Food exchanged	Fish for milk, cereals for oil, rice, etc.	Wild fruits for cereals. Most goods handled by market women are tradeable (eg. fish, grains, milk, foleri, peppers, etc.)
With whom	Milk w/Peuhls of village. Other with boutiques.	
Frequency	Very frequent: many use grain stocks to barter for all other foods.	
D. FOOD SHARING		
Who	Relatives and friends.	No. "If you have you eat with your family, if you don't have you starve with your family"
What	Harvest. If good, share, but when stock is low, cannot help others.	
How often	Not so frequent, everyone is poor.	
E. FOOD DONATIONS		

	NGOUI	MERI
Organization	Vivre de Soldure from government but last 19 mos. ago. PPNS brings food to village. Five years ago cooked as group.	None
Quantities	Each child: 4 kg. cereal, 1 liter of oil, 2 packets milk powder. Each mother takes her allotment. All children 3 mos.-5 yrs.	
Most recent	Last month.	4 years ago.
Frequency in last year	Not quite every month.	
F. GATHERED FOODS		
Kinds and where found	Mourtode, jaabe, paguiri, guidjile (has brought in-no trees here), oulo, quinqueliba (brought in from dieri by nomads), dayrii, tabbe. Bokki (only 2 in village, belong to one man).	Mourtode (here), jaabe (dieri), pagiri, to be guidjile (dieri), oulo, tupere, saputa, tireo (green leaves), quinqueliba (dieri).
How often	Mourtode and jaabe gathered morning and night now. Pagiri gathered now. Oulo earlier in rainy season-now eat haco. Dayrii and tabbe gathered earlier during rains.	Frequent.
Availability by season	Fruits now actively exploited. Leaves used earlier in rainy season.	Mourtode, jaabe, guidijile all ready now.
Preferences	Pagiri-poorer families gather as much as 1 sack, but people like the taste, despite difficult pounding. Like them all.	Like all fruits. Pagiri viewed as hunger food (only few kg. gathered at a time.)
Sale	Fruits exchanged by village women. Quinqueliba, bokki brought in by Peuhls.	Mostly exchange for cereals. Buy baobob products.
G. STORAGE AND PRESERVATION		
Products stored	All cereals grown, some dried leaves.	Cereals.
Types of storage	Put in "sak" or bancos mainly on stalks.	Bancos - mud walled granaries. Stored on stalks.
When stores depleted	Depends on family-some six mos. ago. Most are now buying all grains.	Some lasted only 1 mo. Fellah-1 mo., others much longer. Rice-all purchased now.
Causes of loss	Mice, termites, weavils. To combat weavils in cowpeas put in jar, mix with ashes or sand and seal. Powders-some from Saed but not much.	Mice, termites. Only way to combat rodents is "beat with a stick."

	NGOUI	MERI
H. SEASONALITY OF CONSUMPTION		
1. Foods in short supply in this season	All cereals in short supply (millet, same, fellah). No vegetables. Note: Demand for fish goes down now that there is more milk during rainy season.	Souna very rare. Rarely get peanuts. Other cereals including rice are difficult to get. Vegetables. Note from fish seller: demand for fish decreases in wet season because people drinking more milk.
2. Coping with shortages - substitute foods	See meals.	
Selling personal items	Women have sold anything that can be sold.	Yes.
Number of meals reduced	Some may eat only once a day at midday or some twice a day.	Always eat at midday-may skip other meals.
Off-farm work	Women sell the fish (own money for food, clothing, etc.)	Remittances less dependable.
Other income for food purchase	Make mats, market women, make pagne.	Market garden.
Credit (borrowing food from merchants)	Available-but great variation. Some get 25 CFA, others up to 1 sack of grain.	Only some people in whom merchants have "confidence". Not much (10-20 kg). Poor can't get any.
What merchants	Here and in neighboring towns.	Only in village.
Borrowing from friends/relatives	Yes.	Nobody can borrow because no one has anything to lend.
3. Disease types	Malaria, schistosomiasis, colds, stomach, muscle aches.	Malaria, fatigue.
Diarrhea prevalence	Lots of problems. More now than in the dry season.	Very common.
Treatment for diarrhea	Lalo pounded and drunk. Kodipile-bouili of same made with butter.	Have infirmary. Told to make rehydration fluid (ORT).
Other treatments	Mainly go to infirmary in Pete or village 7 km. away. Some "leaves" to reduce fevers.	Mourtode good for stomach problems. None for malaria except modern medicines.
4. Water source	Marigots.	3 wells but only 2 working. Some use marigots.
Seasonal variation	Available all year.	Problems in dry season.
Changes in well level		Don't know.
I. FOOD PREFERENCES		

	NGOUI	MERJ
Meat/fish	Like the variety both meat & fish although fresh fish much preferred	Like meat - eaten very rarely (all varieties). No butcher here. Eat a lot of fish.
Cereals	All liked.	Souna.
Qualities desired in cereals	Like variety in preparation & cereals.	Taste, habit. Doesn't need other ingredients. Preparation time.
Why some preferred over others	Even though maize difficult to pound, still eat a lot as couscous, gniri, and bouilli.	Souna preferred because of tradition and because does not require fish, less costly, takes less time to prepare.
Food preferred if more money		Still prefer souna. Rice is recent.
J. FOOD PREPARATION		
Major dishes and ingredients	Couscous (maize, souna, rice, same, fellah, nyidigo), gniri buna-dry fish lidi (fresh fish),kwassam (milk);yaninongo-pounded cereal and cowpea boiled w/salt; sauces-fish, cowpeas, milk, oil, tomatoes, onions, if can afford. Lalo in couscous.	Couscous (maize, same, fellah), rice, gniri.
Meals-what eaten and quantities (1 household) yesterday for: Breakfast	8-10 a.m. Leftover couscous from night before w/haco or fresh milk if available or just with sugar and water if no money. Some coffee and bread.	Coffee and bread. Couscous w/haco from night before.
Lunch	2-4 p.m. Gniri (w/dry or fresh fish or milk). Rice as bouilli or as mafe domada or with peanuts.	Gniri (same, fellah, maize) w/dry or fresh fish. Rice w/oil, fish, foleri, maggi cubes, tomatoes. If no fish eat w/cowpeas.
Dinner		Couscous w/haco or w/watermelon w/fresh or dry fish if available.
Snacks		Wild fruits, sweets.
Preparation, techniques, when	Pound once in the morning.	Women in 1 household take turns cooking.
Time spent getting fuelwood	Mostly women. About twice a week-near the village. Some buy-one pile 25 CFA.	Gathered daily by women in dieri. Some buy cart load=1500 CFA; 4 pieces=25 CFA.
Amounts, local measures (per person)	For family of 2 adults, 3 kids, prepare 4 kg. of cereal a day.	Family of 5 adults, 7 kids; 4 kg. rice, 4 kg. other cereal per day.
4. Access to grinding mills, where	None. Some go to Pete'.	7 public, private, also rice husker from SIMAD
Cost	115/moud for all including maize.	500/moud same price for public & private.
Frequency	Occasional.	Most women use mills.

	NGOUI	MERI
If by hand, time spent pounding	Maize takes about 4 hrs. others less.	Once a day - several hours.
K. FOOD HABITS		
1. Food taboos/religious		Moslem taboos.
Pregnant women	Used to not eat couscous at all only gossi or boulli. Thought harmed child. Now doctor tells them to eat everything but salt.	None-now told not to eat salt. Crocodile in olden days.
Children	Before eggs and fish.	None.
2. Weaning foods	Given adult foods. Before milk and rice bouilli.	Bouilli made of souna, milk, lots of adult foods.
3. Other foods for women who have just given birth	Gossi, bouilli, quinqueliba. If husband can afford, get meat or chicken soup.	Milk, gniri w/milk. Husband kills a sheep if he can.
Foods for children of non-lactating mothers	Milk.	
4. Breastfeeding duration	Some 14 mos. Others as late as 36 mos.	24 months (some earlier, 18 mos.)
How weaned	At about 8 mos. some supplement. Others wait until weaned.	At 6 mos. start supplements.
L. WOMEN'S FARMING ACTIVITIES		
Access to land	Mostly help on husband's fields (drop seeds, transplant, harvest).	
Owned/borrowed	Most cultivate husband's field. Some widows have inherited own walo. Divorcees farm family's lands. Also sharecrop.	
Irrigated/rainfed/recession	Walo. Dieri.	Dieri-mostly husband's land. Some women have own irrigated parcels. Walo-work on husband's land unless single.
Changes with drought	No women do ag. wage work. Less land to cultivate.	Some women who used to farm have moved into trading.
Crops grown - grains	Dieri: cowpeas and melons.	Souna, pode, some rice, same, fellah, maize, (but not all women).
Vegetables	Walo-potatoes (sweet), tomatoes, folleri, cowpeas, okra, melons (jayigi, chaole, boudi)	Tomatoes, onions, peppers, carrots, beets.

	NGOUI	MERI
Consumed/Marketed		Rice only for consumption. Others depend on harvest.
Desired intervention	Want a market garden (for women), mill. Note: Women have small seedbeds near their houses (about 10sq.m). Propogate sweet potato cuttings, start tomatoes, and folere to transplant to walo. Planted in small raised beds watered and shaded.	
Livestock, ownership, which animals	Some women have 2-3 goats or sheep. Some chickens.	Mostly sold to buy food.
Products consumed/marketed	Part of milk sold, part consumed.	
Animals consumed/marketed	Animals sold when severe need of money.	
M. MARKET GARDENS		
Organization	Youth coop started 1985 (162 members). initiative. Spent 9000 CFA on seeds in Podor and Dakar. Planted Nov., applied manure.	2 gardens: one youth, other adults (men & women). Each person own parcel-no collective. Purchased seeds, manure applied.
Seasonality of crops grown	All dry season: eggplant, onions, carrots, peppers, lettuce, cabbage, bitter tomatoes, tomatoes, squash, potatoes.	All dry season.
Consumed/marketed	Sold all here (35,000 CFA) but poor harvest (did not meet demand).	Varies by individual.
How marketed	Sold in village even to coop members.	
Source of water	Marigot (500 m). Women carry water, men water. Women work in groups of 17, men 13.	Watered by hand from well, 2 times a day.
Constraints	Lack of water. Worms in cabbage and tomatoes. Rats, termites, winds.	Water, insects.
General Observations Areas of research	Active youth coop - trying to get a health care project from UNICEF started. Have sent 2 to Pete for some training. Garden-no access to insecticides. Bought some watering cans	

SUMMARY OF RESULTS OF THE CONSUMPTION SURVEY
SENEGAL RIVER BASIN

VILLAGES:	DIERI DIOUGA	DIERI DIOBE	MAFRE DEKOLE
		Pop.: 3360, Halpulaar	Pop.: 400 people. Peuhl (Not a real interview.)
A. MARKETS			
Location	Small market in a shed. No boutiques left (had 5 before drought).	No market. Toulgegali (300 m. away) has one.	Go to Podor (339 km. away) to buy milk.
Type of market (period, etc.) Food prices	Available: Fish: dry-2 small 100; fresh-2 small 150. Tomatoes-350 CFA/moud. Peanuts-400 CFA/kg. Kanje, peppers (black & red). Rice-paddy=250/moud; clean=180/kg. Same-100/kg. Maize-350/moud (not in village). Cowpea-150 CFA for small teaglass. Oil-500 CFA/liter (women buy it at 475 CFA in Hare Lao for resale). Tea-175-200 CFA for teaglass. Sugar-425/kg. (Buy powdered milk in 3 qualities: 1) 850/kg; 2) 600/kg; 3) 475/kg.: poor quality.)	Peanuts - 400/kg. Meat - beef 750 kg.; goats - 800 kg. Rice-200 kg. Paddy-300/moud. Same-500/moud. Maize is rare now so costs 600/moud. Oil-500/liter. Pode: moud in dry season=500 CFA, now 300 CFA/moud. Cowpea-teaglass 50. Sugar-450/kg. Tea-200/small glass. Salt-375-500/7 kg. Milk powder-5-1000/kg. Fish-2 big 200 fresh; dry-200-500 CFA/kg.	Butter: 1liter = 2000 CFA. Calabash of milk - 25 CFA. Works out to about 125/l. In past years when milk supply is low 200 CFA for calabash (about 5 calabash to the liter).
B. FOOD PURCHASES			
Items purchased daily	Varies by available money.	Fish, tea, oil, rice.	Dry fish purchased along paved road or in Podor. No fresh fish.
Articles purchase less frequently (2 or 3 days)	Some can afford to buy sacks of grain, dried fish, oil in quantity (but none knew price so must be rare).	After harvest buy sacks: 15000/100 kg. same; 7500-8000/50 kg. on the highway. Rice-1750/100 kg. Now just in boutiques in small quantity.	
C. BARTER			
Food exchanged	Milk for cereals (1:1). Some wild foods but very little.	Cereal or rice for milk, salt, lalo, quinqueliba, butter.	Exchange their milk for rice, oil, cereal, tomatoes. Exchange rate: 2 milk for 1 cereal (sometimes 1:1).
With whom	Nomads bring in milk.	With women in the village. None with merchants-only cash. Peuhls bring in wild foods/milk.	Villagers.

	DIERI DIOUGA	DIERI DIOBE	MAFRE DEKOLE
Frequency	Less in recent years.	Frequent.	Once a week.
D. FOOD SHARING			
Who	Neighbors.	If a neighbor has nothing, share with them.	
What	Meals.	Give them ingredients and they cook in their own house.	
How often	If you have no food in the house your neighbor may ask you to share his meals.	Sometimes.	
E. FOOD DONATIONS			
Organization	None. No PPNS. Built a building to house infirmary but destroyed by rain.	Government PPNS-very little. Most mothers don't participate.	
Quantities	N/A	Last year 2-3 sacks per carre.	
Most recent	Not since 1985.	1985.	
Frequency in last year	-0-	-0-	
F. GATHERED FOODS			
Kinds and where found	Murtoki - eat leaves as well. Regeo - leaves. (Note:these leaves cannot be dried. Must be eaten fresh). Jaabe.	Lalo comes in from dieri (far away). Naoco (like quinqueliba). Guidijile. Baobob fruit. Mourtode (fruit & leaves). Jaabe. Paguiri-rare now. Oulo. Tupere (tribulis eat leaves when young.) Regeo.	
How often	No oulo here. Must go very far for products-can take whole day (12 km.)	Frequent.	
Availability by season	Mourtode & jaabe in Nov-Dec but most are dead.	Guidijile, mourtode, jaabe now ready. Leaves earlier in rainy season.	
Preferences	Haven't seen paguiri in 10 yrs. and miss it.	Used to eat a lot of paguiri but less available now-eat it if very hungry. Like the fruit best.	
Sale	Some but not much.	Not sold.	

	DIERI DIOUGA	DIERI DIOBE	MAFRE DEKOLE
G. STORAGE AND PRESERVATION			
Products stored	Rice, sorghum, cowpeas.	Rice, same, cowpeas.	
Types of storage	Used to build sak and banco but since less to store don't bother - some can process all at once and store in sacks.	Used to make sak or faura (mud granary) but now put in-inside banco. On stalk, process as needed.	
When stores depleted	Nothing left now. Only seeds for walo planting. Many depleted same around July. Rice only 1 1/2-2 1/2 mouds left. Quantities small to begin with, shared.	Rice-must sell 1/2 or more to buy other ingredients so didn't even last 1 month. Same also only 1 mo. Cowpeas-buying for seeds.	
Causes of loss	Termites, rats. Some keep cats, some build wooden platforms, others buy powders.	Termites, rodents. Only way to combat is cats. Powders not available.	
H. SEASONALITY OF CONSUMPTION			
1. Foods in short supply in this season	No fellah available, nor souna. Cowpea-cannot afford to eat, only buying seed. Lots of foods regularly unavailable in this village (must go to larger centers). Only paddy rice in village now. Not much variation in price by season, harvest is shared.	Milk only in rainy season. Vegetables. Cereals, pode, rice, oil - can find but expensive.	Milk all year even if powdered.
2. Coping with shortages Substitute foods	Supposed to eat 3 times a day. Now some only eat twice a day. Some families don't eat at all on alternate days.	Eat couscous plain.	
Selling personal items	Yes, but most items already sold.		
Number of meals reduced	Used to eat 3 times a day. Now many only eat 1-2 meals a day if poor.	May skip lunch anyway since working out in the fields. Also may skip due to lack of food.	
Off-farm work	Small trading.		Many immigrants (Dakar, Mali, Gambia, Switzerland).
Other income for food purchase	Husband supposed to supply food and money. If no husband, women farm on own and sell part of the harvest.	Women work as laborers on rice parcels (transplant, harvest, thresh) given 8-12 kg. of rice per day.	Women make calabash covers & mats but don't sell much.

	DIERI DIOUGA	DIERI DIOBE	MAFRE DEKOLE
Credit (borrowing food from merchants)	Can get small amounts (1-2 mouds) for 1-2 days.	None, they are too poor to qualify.	
What merchants	Only here - never other villages.		
Borrowing from friends/ relatives	Very rare.		
3. Disease types	Malaria (every family has at least one sick), measles, diarrhea, apollo.	Malaria, diarrhea, apollo, colds.	
Diarrhea prevalence	All year long.	Lots of diarrhea problems especially at weaning. Many children die at this age. Diarrhea all year long.	
Treatment for diarrhea	Drink salt water. Drink tea of jaabe. No special foods.	Go to infirmary.	
Other treatments		Naoco-good medicine for coughs. Malaria-used to bleed forehead. Appolo-bleed next to eyes.	
4. Water source	2 wells-one for market garden but used for domestic as well.	2 wells-1 started by government but finished by immigrants. Other dug by village collective.	
Season variation	Never dries up totally.	Sometimes nothing in dry season. Go to river 1.5 km. away.	
Changes in well level	Wells very deep.	Wells very deep but not much water in them.	
I. FOOD PREFERENCES			
Meat/Fish	Prefer all meats (beef, goats, sheep) over fish but eat rarely. Men preferred fish, women preferred meat.	Prefer meat-not because in short supply. Fish too messy, lots of garbage, needs a lot of soap, bones.	Meat, but fish since to eat meat requires killing an animal.
Cereals	Same, fellah.	All (same, souna, rice).	Souna.
Qualities desired in cereals	Habit - women know how to fix different dishes.		
Why some preferred over others	Used to prefer millet but has been in such short supply in recent years so changed preference to sorghum. All cereals same amount of work but with	Same and rice are easier to prepare but that is less important than supply.	Like the taste of souna and has good associations with abundance. Prefer same over rice-know sorghum better and know how to work it.

	DIERI DIOUGA	DIERI DIOBE	MAFRE DEKOLE
	sorghum get larger quantity.		
Food preferred if more money	Meat (including chicken). Meat eaten only for ceremonies, visitors or if animal dies.		Milk-if not enough fresh milk buy powdered milk.
J. FOOD PREPARATION			
Major dishes and ingredients	Couscous, gniri, rice. New dishes since drought:seafish, packaged milk, rice dishes like mafe, yassa. Dishes no longer eaten include lots of butter and river fish.	Couscous (purchase rice or same). No fellah or nyidigo here. Mafe domada. Cossi (made of maize). Ruiz. Laru-gniri mixed w/foleri, fish, salt. Used to eat more milk, butter (didn't use peanut oil). Eat fish 2-3 times a day.	Couscous or gniri w/milk-these are the preferred. Now eat rice and nboderi. Before ate butter eg. Gniri meri w/fish or meat or cowpeas.
Meals-what eaten and quantities (1 household) yesterday for: breakfast	Couscous w/milk (some made w/ rice since other cereals in short supply-souna, same,fellah) Some eat coffee, biscuits & bread from Hare Lao.	Coffee or tea w/bread. Some eat couscous leftovers either w/haco or if have animals with milk.	Couscous and milk.
Lunch	Gniri buna (w/dry fish, used to eat w/lots of butter). Gniri w/milk. Rice w/fish (used to be river fish). Gniri w/melon or w/cowpeas. Gniri eaten more than rice because takes less ingredients than rice.	Gniri w/kwassam, dried fish, beref, fresh fish. Rice w/oil and fish (dry & fresh). No vegetables.	Gniri or rice w/oil, maggi, fish.
Dinner	Couscous w/haco, some just plain couscous. Sauces w/haco, beref or dried fish.	Couscous w/milk, haco, dry fish (no cowpeas, no peanuts). Meat eaten very rarely (maybe twice a month) for guests. If mix baobab w/water and add a little sour milk almost like milk. Stretches small milk supply.	Couscous w/milk.
Snacks	Wild fruits.	Can't afford.	
Time spent getting fuelwood	Wood 1.5 km. away. Everybody collects (men, women, children). Wood never sold.	Not too time consuming. Everyone involved, go 1.5 km. away.	
Water	Well is very deep (35 m)-need cords, hard work.	No problem in rainy season, but walk in dry season 2 times/day, 3 trips each time.	

	DIERI DIOUGA	DIERI DIOBE	MAFRE DEKOLE
Amounts local measures (per person)	Family of widow w/2 adult women and 4 small children eat 2-3 kg. a day.		
4. Access to grinding mills Where	None here. Closest is in Hare Lao about 13 km. away. Go rarely-only if there for other reasons.	None here, in Dodil 8-9 km.	
Cost		Don't seem to know.	
Frequency	Some pound 3 times a day. Rice needs 2 poundings (clean) while other cereals processed all the way to flour.	Transport costs 200 CFA alone.	
If by hand, time spent pounding	2-3 hrs/day. All females contribute.	Lots of different poundings required even for one meal-cereal rice, watermelon, lalo. If visitor comes start over so very time consuming.	
K. FOOD HABITS			
1. Food taboos, religious	Differs by caste.		
Pregnant women	Depends on caste-each group has own.	Only avoid what makes them sick. Doctor says to avoid salt.	
Children	Used to have belief about eggs-no longer. Other beliefs-eg. children should not touch cat or teeth not come in.	None.	
2. Weaning foods	Adult foods.	Milk and adult foods. Some gossi, ruiz.	
3. Other foods for women who have just given birth		Gossi, karow (pounded cereals made into balls), ruiz, meat if can afford.	
Foods for children of non-lactating mothers		Milk.	
Foods for sick		Nothing special.	
4. Breastfeeding duration	12-24 months when pregnant or when child loses interest may be earlier.	18 months whether walking or not.	
How weaned	Start supplementing about 6 mos.	Very abrupt-done in one day, but	

	DIERI DIOUGA	DIERI DIOBE	MAFRE DEKOLE
		supplement when can sit up (6 mos.)	
5. Care of children while women work		Other children.	
L. WOMEN'S FARMING ACTIVITIES			
Owned/borrowed	Husband's unless unmarried.	Some widows have inherited husband's parcels but walo considered man's land.	
Irrigated/rainfed/recession	Dieri, Falo and Walo. No women have own irrigated parcels. Help w/transplanting, threshing and do all the winnowing. No women do wage work here but Maure women do in neighboring village.	Some women sharing on rice parcels (can do all the tasks.) Women grow sweet potatoes in falo-all their own.	
Changes with drought	Fewer cereals produced.		
Crops grown - grains		If on own, grow same crops as men. Cowpeas, pode, foleri are woman's responsibility.	
Vegetables	Women care for the cowpeas, watermelon in dieri and sweet potatoes in falo.	Beets, lettuce (note: didn't know know how to eat. Tried cooking w/oil & fish. Then gave to animals), cabbage, onions.	
Minor		Sweet potatoes.	
Changes in crops grown	None.	No more cotton or indigo.	
Consumed/marketed		For cowpeas, pode and foleri must get husband's permission to sell.	
Changes in women's farming with outmigration of males	Some women do all the farmwork themselves, but others under another man.		
Desired interventions	Desire to learn how to read (French & Pulaar). Would like vegetable garden. Need cords for drawing water. Want dispensary (closest is Njoum). Want a mill.	1) Mills; 2) water; 3) other villages better developed than they.	Note: Dry meat sometimes by cutting it in strips & winding around stick. Never dry milk.
Livestock, ownership,	No animals left, all have died.		Lots-3 inheritors; wife, son, daughter. Men inherit twice as

	DIERI DIOUGA	DIERI DIOBE	MAFRE DEKOLE
			many, but debts must be settled first.
Products consumed/marketed	Women do the milking.		Each woman takes her own milk in once a week to Podor to sell (at least 30 l). Women do the milking.
Animals consumed/marketed			Order of animals sold: goats, sheep, beef.
M. MARKET GARDENS			
Organization	Two gardens begun in 1984 by SIMAD (dug a well & gave some watering cans). Older people's garden abandoned. Interfered with walo work. The young people's garden operated as a collective. Hope to use proceeds for village projects like mosque. Use manure.	Started last year but destroyed by insects. SIMAD gave them some seeds (they bought others), gave them watering cans, pails, rakes. Started as collective (eg. made fence, seeded) but then broke up into individual parcels. Each person responsible for watering own parcels twice a day.	OFADEC built the garden, 6 ha. Have tractor, 48 parcels, 25 x 40 each. Every farmer has own (some women but mainly men).
Seasonality of crops grown	All planted around November-seeds bought in Njoum. Onions did well, also mint. Many "European" did poorly: Cabbage, eggplants, beets, carrots.	Got no cabbage. Onions just the leaves. Not whole range of seeds (eg. no carrots, potatoes, beets).	Grow watermelon, cowpeas and other melons in current season. Cool dry season vegetables like onions, cabbage,tomotaoes,etcc
Consumed/marketed	All sold within village. Small revenues used to buy seeds.	Very poor yields. One man got only 1 kg. from his plot.	Tomatoes sold to canning factory. Onions sold in Dakar.
How marketed	Sold by members of collective.	Not enough to market.	
Source of water	Well dug by SIMAD.	Well.	Bore hole w/pump-CARITAS (230 m. deep-18 million franc).
Constraints	Insects (worms in cabbage), fence broken. Tomatoes a variety that doesn't do well here.	Ravaged by insects-borers in cabbage.	Planted late in Dec. so winds troublesome. Problems w/ storage and transport.
General observations Areas of research		Will abandon garden this year.	Problem w/labor-herders left w/herds and parcels went uncultivated.

APPENDIX C

GATHERED FOODS AND MEDICINES

Pulaar	Soninke	Hassanyia	Scientific Name	Use
murtode (murtoki-is the tree)	sexene (sekhene)	tongue or tougue	Balanites Aegyptiaca	Yellow fruit at end of rains, soap made from nut; medicinal
jaabe	fa	sidraye	Zixphus Mauritania	Small orange fruit; medicinal
bokki	kiide (kide)	--------	Adansonia digitata	Fruits-pain de singe-medicine bard=cord leaves=-laalo mushrooms-Kidie xaxe
paguirri	jaaje (diadie)	az	Brachiaria hagerupii	Small grass seed
guidgile	mandaxe (mandakhe)	---------	Boscia Senegal-ensis	Fruit, medicinal
dayrrii or tabbe	bude or tabbe (boude or tabbe)	---------	Nymphaea lotus	Seed from flower plus rood eaten (water-lily), medicinal
caapato (Tjapato)	--------	--------		Same plant as above except with red grains, called "Maure" in Pulaar

APPENDIX C

GATHERED FOODS AND MEDICINES

Pulaar	Soninke	Hassanyia	Scientific Name	Use
oulo	kasa (kasse)	--------	Cassia tora	Leaf eaten as leaf sauce
kenkeliba ("kinkili") (quinque-liba-Fr.)	xande	--------	Cambretum micranthum	Leaves of tree used for tea
eri (eede is fruit)	denmbu	--------	Sclenocarya birrea	Acid fruit, hardwood for pestles, etc.
gawdi (tree) gawde (fruit)	jabe yitte jabe renme	--------	Acacia scorpoides (nilotica)	Paste from fruit used in tanning leather
caski	kune	avrerayye	Acacia albida	Pods for fodder; tanin from bark
dacche (gum)	kanbare (cambare)	--------	Acacia Senegal	Medicine, wild food, gum
pattuki (tree)	xiile			
jabbe (fr. tammarinier)	xaralle	--------	Tamarindus Indica	Fruit and drink, herb/spice, seed edible
takiette terabbe	--------	--------	--------	Grass made into laalo (common in the guidima-ka)

APPENDIX C

GATHERED FOODS AND MEDICINES

Pulaar	Soninke	Hassanyia	Scientific Name	Use
gumgume (goumgumme)	gungunme (goumgoume)	--------	--------	Type of mint used in tea and to cure medical problems (mental - jom hoore) and other illnesses
kelli (keeli)	sanbe (Sambe)	Thijij	Grewia bicolor	Herding sticks, perhaps other uses?
tuupere	dagare	--------	Tribulus terrestius	Saure leaf
lalo bacli	taxaye	--------	Corchorus tridens	Grass, dried + used in sauce
ngaado	--------	--------	Dicadi longifolium	"Wild onion," morpho-logically resembles an onion (used to kill rodents), poisonous to certain animals
(koylonye)	xollinne	--------	--------	Nut, herders specialty
sorbadde	luxulaaxa	--------	--------	Root in sandy soil (very watery), wood for chewing sticks

APPENDIX C

GATHERED FOODS AND MEDICINES

Pulaar	Soninke	Hassanyia	Scientific Name	Use
Regeo	--------	--------	--------	Tree with small leaves, cut leaves and use twigs for chewing stick
Lalo	--------	--------	Corchorus olitorius	Medicinal, sauce
taxaye	--------	--------	--------	--------
alluki	Jabe	--------	acacia radiana	--------
takiette terabbe	--------	--------	--------	Grass leaf dried and ground into powder/used like baobab leaves in couscous (therefore a kind of laalo)
gellooge (fr. Palmier doum)	--------	--------	Hyphaena theabaica	--------
koppi geloodi (knees of the camel")	--------	--------	Trianthema portul-acastrum	Leaves for sauce
safato	--------	--------	--------	Weed used for sauce
--------	--------	--------	Digitata exilis	Eaten? Perhaps as a leaf

APPENDIX C

GATHERED FOODS AND MEDICINES

Pulaar	Soninke	Hassanyia	Scientific Name	Use
ndagedji	--------	--------	--------	Wild potato, eaten like potato
lawnande	katabaane	--------	Combretum aculeatum	?
capotoye Alla	--------	--------	Leptadenia pyrotechnica	Massage; other uses?
nofel mbaalu	--------	--------	--------	?
--------	dere	--------	--------	Like spinach
--------	Jomba	--------	--------	Fruit
--------	toureme	--------	--------	Fruit
keboy- diji	--------	--------	--------	?
sumaani nimsa	--------	--------	Portulca oleracea	Sometimes confused with koppi geloodi; used to make soap, the plant is dried in the sun, burned, ashes put in a cloth and set over the cooking pot in a couscous steamer while hot

APPENDIX C

GATHERED FOODS AND MEDICINES

Pulaar	Soninke	Hassanyia	Scientific Name	Use
sumaani nimsa	--------	--------	Portulca oleracea	water is poured over it, pottasium rich water is boiled down a bit and animal fat stirred into it, then it's formed into balls while soft and still hot and set out to harden
bulbi	gesexulle	--------	Acacia seyal	Bark is medicinal
gawdi	jabe	--------	Acacia scorpoides (nilotica)	Fruit medicinal
geloki	xaame	--------	Guiera senegalensis	Leaves as cough medicine
aljanawi (or aljanaw	nemimaaso	--------	Cassia occodentalis	Medicinal herb, used on sore muscles and open sores
nammaade (or nammaari)	gasanbe	--------	Bauhinia rufescens	1-cure stuffed nose, boil leaves and drink. 2-diarrhea medicine, pound leaves and drink
cekirijeri	--------	--------	--------	Boil bark of tree, eases labor pains

APPENDIX C

GATHERED FOODS AND MEDICINES

Pulaar	Soninke	Hassanyia	Scientific Name	Use
--------	daraase (Drasse)	--------	--------	Put leaves in fire and cover head and breath for cold
--------	Ketebene*, Ketemene** (Ketebene)	--------	--------	Put leaves in fire and cover head and breath for colds
wiiro (cotton)	kottone, kottolle	--------	--------	Fruit mixed with milk as diarrhea treatment

*Name given according to the region
*Guidimaka followed by **Gorgol pronunciation.

APPENDIX D

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SENEGAL

Report No. 2

Farming Systems Research Along the Senegal River Valley

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Senegal Agricultural
Research Project II

College of Agriculture
The Office of Arid Lands Studies
The University of Arizona
Tucson, Arizona
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FOOD CONSUMPTION IN THE SENEGAL RIVER VALLEY

A RAINY SEASON FARMING SYSTEMS RECONNAISSANCE SURVEY IN THE MIDDLE VALLEY BETWEEN PODOR AND MATAM, SENEGAL

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Executive Summary

This report presents the findings of a rainy season survey of food consumption conducted in Senegal in the Middle Valley of the Senegal River. Twelve villages between Podor and Matam were studied between October 6–15, 1986. Two similar surveys were conducted in Mauritania in February and September of 1986. The food consumption studies collected a wide range of information in an effort to understand what constraints farm families face in their efforts to feed themselves. Topics included food preferences, preparation, purchases and prices. The seasonality of food supplies and consumption was also investigated, as were techniques and problems of crop storage, use and importance of wild foods and frequency of free food distributions. Some of the food consumption issues related to health were included in the questionnaire, such as specialty foods for childbearing women and their infants.

This project was supported by USAID Dakar under the auspices of the Senegal Agricultural Research Project II, directed by the University of Arizona. The study formed part of a farming systems reconnaissance survey which examined a wide range of issues including cropping patterns, animal husbandry, and marketing. The food consumption survey profited from this systemic information as well as contributed additional information on women's farming and other economic activities, and vegetable gardening. The findings of the consumption survey are summarized below.

Food Preferences

- The shortage of traditional cereals such as sorghum and millet may account for a common preference for these foods.

- Food preferences are affected by a variety of factors including supply, cost, preparation time, cropping strategy and associations with the past.

- Meat was generally preferred over fish, perhaps because it is eaten infrequently.

Food Marketing and Purchases

- A significant portion of the food eaten by most farm families is purchased.

- Rice is available for purchase in virtually every village throughout the year.

- Fish, especially dried sea fish, is the most actively traded and universally available foodstuff.

- Some foodstuffs, such as oil, sugar, tea and powdered milk are widely available even in villages which lack formal markets. The range of goods which are imported is, however, limited.

Meals and Food Preparation

- Most families eat three meals a day, although quantities and quality of meals may diminish in times of food shortages.

- A limited number of dishes are prepared, most of which can be made with the whole range of available cereals.

- Long term changes in the diet include decreased consumption of fresh milk, butter and river fish and the addition of imported foods.

Food Storage and Depletion of Stocks

- Many farmers have stopped constructing traditional granaries due to small harvests, and store grains inside houses. Pests tend to be a more serious problem under these conditions.

- Virtually all households had depleted their cultivated grain stocks from the previous year's harvest by October and many had kept them only a few months. Stocks are quickly depleted by the need to sell them in order to purchase other foods.

Free Food Distribution

- None of the villages surveyed were currently receiving any free food aid. Some villages had child feeding programs.

Wild Foods

- Wild foods have decreased in availability with the drought but continue to be valued as a source of fresh food.

- Most commonly exploited are the wild fruits, but leaves used in sauces, and wild grains are also collected.

Seasonality of Foods

- The well-developed road network has diminished seasonal variation in the diet. Many staples including rice, fish and oil are available year round.

Food Prices

- Locally produced goods show less variation in price from one village to the next than do imports.

- The prices for basic commodities, such as rice and oil, fixed by the state show some markup, but not a great one in village markets.

Specialty Foods and Health

- Few specialty foods exist for childbearing women, their infants or the sick.

- Children are generally weaned at 18 months, but most have been given supplemental food since 6 months of age.

- Diarrhea is a chronic problem but most severe at the change of seasons, and when children are weaned.

Women's Farming and other Economic Activities

- Most women participate in farming either helping with the cultivation of their husbands' fields or tending their own crops or fields.

- Widowed or divorced women may take complete charge of farming operations, as may women whose husbands are long-term migrants.

- Case histories of a widow, a divorce, and a female fish trader are presented.

Food Consumption Constraints and Recommendations

a. Food Shortages

1. Improvements in the market infrastructure are needed to increase the range of foods reaching rural villages.

2. The promotion of higher value cash crops such as peanuts and sesame could provide a better rate of exchange and help safeguard the family's consumption of traditional cereals.

3. Investigate the possibility of creating cooperative food boutiques which could help minimize distortions in the market, seasonal variation in prices, and the lack of credit.

4. Efforts must be made to decrease storage loss to pests, especially with recent changes in storage technologies.

5. Reforestation programs could help alleviate the decrease in wild food availability.

6. The promotion of small livestock raising around the compound could supplement diminished milk supplies.

7. Research should be directed at the minor crops such as okra, melons and hibiscus.

b. Labor and Time Constraints

1. Efforts need to be directed towards maintenance of existing grain mills, including operators who are trained in simple repairs.

2. The burden of drawing water from wells could be alleviated with simple technologies such as pulleys.

3. Fuel efficient cookstoves would save time and fuel.

4. The time lost to sickness is significant and should be further studied, including the decreased use of traditional remedies.

c. Constraints of Female Farmers

1. Since an increasing number of women are responsible for agricultural decision-making, extension efforts should be directed more specifically at women.

2. Further study of women's access to and involvement in irrigated perimeters is needed.

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I. INTRODUCTION

A food consumption survey was conducted during the rainy season in Senegal in the Middle Valley region of the Senegal River between Matam and Podor. This survey was carried out between October 6–15, 1986 in conjunction with a farming systems reconnaissance survey . This project is supported by USAID/Dakar under the auspices of the Senegal Agricultural Research Project II. The study is directed by the Office of Arid Lands at the University of Arizona. The primary goal of the entire survey was to provide data on the farming systems of the region to help ISRA, SAED and OMVS establish research priorities for the research station at Fanaye. A wide range of issues was investigated by a multi–disciplinary team including cropping patterns, animal husbandry, off–farm economic activities and marketing.

A food consumption component was included in the reconnaissance survey in an effort to understand what constraints farm families face in their efforts to feed themselves, and to assess how these factors affect their productive activities. The links between consumption and production are thus considered crucial. This point of view accords with the new agricultural plan released by the Senegalese government in 1986 which places great emphasis on improving the food supply and standard of living of its rural inhabitants, while attempting to attain self–sufficiency in food production and increase agricultural exports (Diop 1984, ISRA 1986).

Many of the components of the new agricultural plan have implications for consumption. The desire to meet the food needs without depending on imported cereals, for example, is not only a production goal but acknowledges the difficulty many Senegalese face in securing adequate food supplies. Senegal presently meets only 60 percent of its cereal needs, relying for the rest on food imports which have been growing an average of 4 percent a year (ISRA 1986). The domestic production of cereals has been increasing at an average rate of .9 percent, but this small increase cannot meet the demands of a population which grows an average of 2.8 percent a year. ISRA estimates that production of cereals would have to double in the coming years to meet this goal. Meat consumption similarly falls below desired levels (averaging only 8 kg per person per year, short of the goal of 12 kg.).

Several of the objectives of the new plan will be discussed in this report. The goal of encouraging the expansion of private sector involvement in agriculture is relevant to the discussion of food marketing networks below. The market in foodstuffs in the Middle Valley was found to be limited, with few goods imported into most villages along the river basin.

The government also hopes to stimulate agricultural output by, among other things, providing better price incentives to producers. The dilemma which we found many farmers face is the necessity of selling or trading their harvests to enable them to acquire other needed foodstuffs. The poor rates of exchange which they receive for their produce explains, in part, farmers' inability to feed themselves from one harvest to the next.

The plan also aims at reducing post–harvest losses due to pests, an issue which this report discusses under the heading of Food Storage and Depletion of Food Stocks. The protection of the environment is also considered a high priority, including most importantly dealing with widespread deforestation. The discussion

which follows on the importance of wild foods to the diet, and the preferences for certain wild products over others, could help direct these efforts. Finally, the promotion of vegetable gardening as outlined in the new plan could have direct and beneficial effects on the diet of rural inhabitants and is discussed below.

A. Methodology

The food consumption survey aimed to provide a systemic overview of the basic diet, and methods for acquiring food of households in the study villages. A topical outline derived from secondary data sources and past surveys helped guide the conduct of interviews. Two female researchers were involved and gathered consumption data in 12 dieri and marigot villages (see Table 1 and Map 1). One of the researchers charged with food consumption issues had conducted a similar survey in Mauritania. The other researcher has been involved in previous socioeconomic studies in the same region through her affiliation with ADRAO.

The average food consumption interview lasted approximately two hours, and was designed to correspond to the in-depth farmer interviews being undertaken at the same time by other members of the team. Interviews were conducted with groups of village women rather than with individual women, yielding information pertinent at the level of villages rather than households. When time permitted, other interviews were completed with individual women in order to obtain data on their agricultural and trading activities. Translators, when necessary, were drawn from the villages themselves, and were primarily students (male and female).

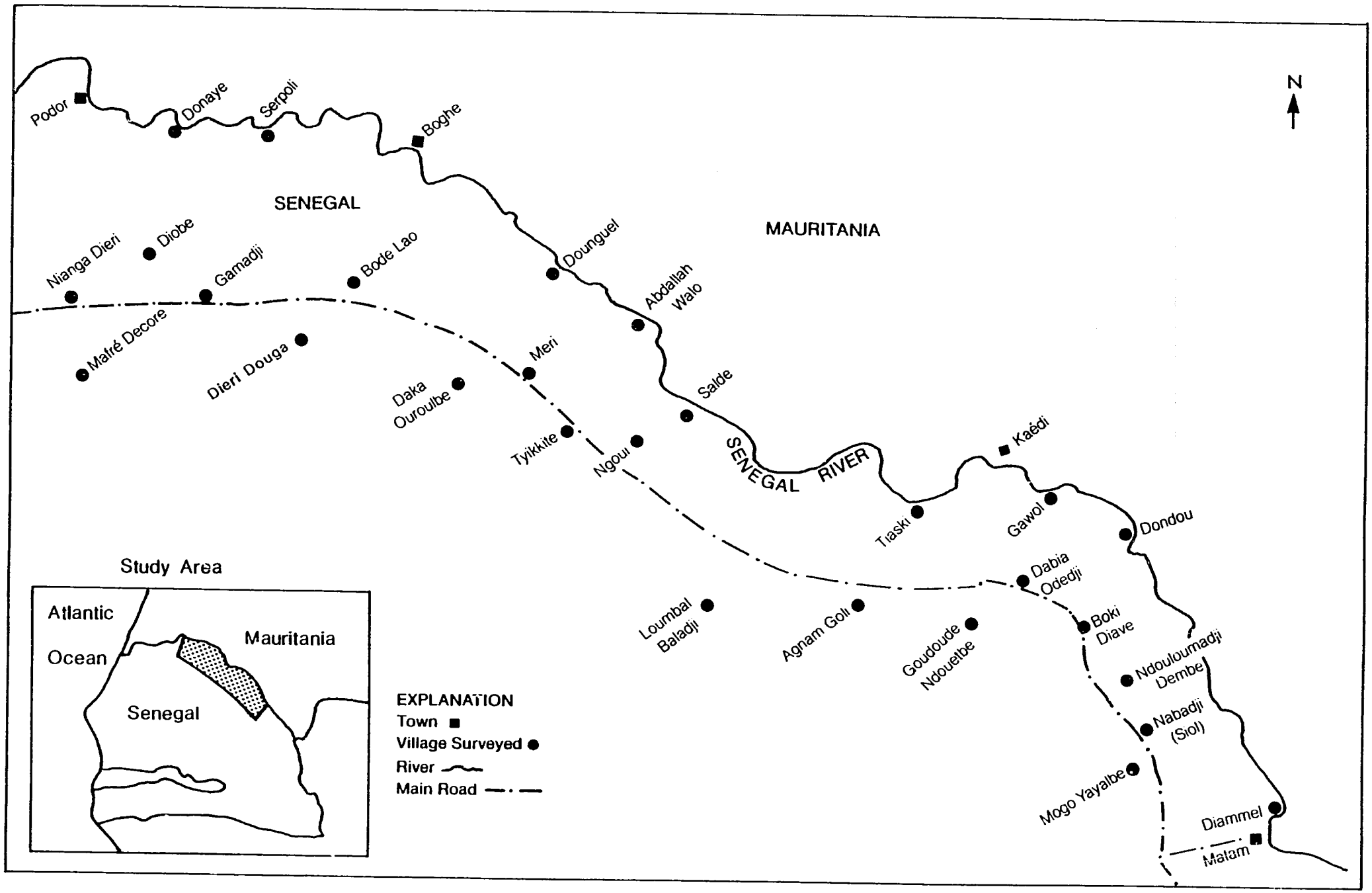
Each of the researchers worked alone so that more villages could be covered during the consumption survey. One of the researchers joined the team after the second day of fieldwork, the other after the third. They worked together on the fourth day to systematize data collection. These data were transferred from field notes to tables to allow inter-village comparisons. Both researchers were involved in team review sessions at Haire Lao and St. Louis to integrate consumption constraints and strategies into the farming systems survey results. At these sessions, some of the food consumption data collected as part of the village wide surveys was discussed (primarily food preferences and the availability of wild foods).

TABLE 1

VILLAGES SURVEYED

Date	Village	Location	Region
Oct 6	Diammel	River	Matam
	Nabadji Siol	Marigot	
	Moto Yayalbe	Dieri	
Oct 7	Dondou	River	Matam
	*Boki Diave	Marigot	
	Ndouloumadji Dembe	Marigot	
Oct 8	Gawol	River	Matam
	*Dabia Odedji	Marigot	
	Goudoude Ndouetbe	Dieri	
Oct 9	Tiaski	River	Matam
	* Agnam Goli	Dieri	
	Loumbal Baladji	Dieri	
Oct 11	Salde	River	Podor
	*Ngoui	Marigot	
	*Tyikkite	Marigot	
Oct 12	Abdallah Walo	River	Podor
	*Daka Ouroulbe	Dieri	
	*Meri	Marigot	
	Thioubulel	River	
Oct 13	Doungel	River	Podor
	*Bode Lao	Marigot	
	*Dieri Douga	Dieri	
Oct 14	Serpoli	River	Podor
	*Gamadji	Marigot	
	*Diobe	Marigot	
Oct 15	Donaye	River	Podor
	*Mafre Decore	Dieri	
	Nianga Dieri	Dieri	

Consumption surveys are available for the starred villages.


N
SENEGAL
MAURITANIA
SENEGAL RIVER
Podor
Donaye
Serpoli
Boghe
Dounguel
Abdallah Walo
Salde
Kaédi
Tiaski
Gawol
Dondou
Dabia Odedji
Boki Diave
Ndouloumadji Dembe
Nabadji (Siol)
Mogo Yayalbe
Diammel
Matam
Loumbal Baladji
Agnam Goli
Goudoude Ndouetbe
Nianga Dieri
Diobe
Gamadji
Bode Lao
Mafré Decore
Dieri Douga
Daka Ouroulbe
Meri
Tyikkite
Ngoui
Study Area
Atlantic Ocean
Mauritania
Senegal
EXPLANATION
Town
Village Surveyed
River
Main Road

B. Content of the Report

The report is organized into three main sections. The first and major section outlines general food consumption patterns. These include food preferences, food marketing and purchases, meals and food preparation, food storage and depletion of food stocks, free food distribution, wild foods, seasonality of food supply, and food prices. Inquiries also were directed toward health-related food issues including weaning practices, specialty foods for childbearing women and the most prevalent health problems.

A second section discusses the involvement of the women of the river basin in agriculture and other productive activities. Since most of the villages included in the food consumption survey were predominantly Toucouleur this report focuses on Toucouleur women. Some contact was made with Peuhl and Soninke women, but a discussion of their economic activities would require further study.

The final section outlines the major constraints related to consumption and makes recommendations for possible interventions and further research. The appendices include the topical outline used for the consumption survey, the data summaries of the results of the survey, a list of wild foods, and references cited.

II. FOOD CONSUMPTION PATTERNS

A. Food Preferences

Food preferences play a potentially important role in affecting the likelihood of farmers' accepting new or improved cultivars. For this reason, and in order to better understand farmers' current cropping strategy, the food consumption interviews elicited opinions on preferred grains and meat. These questions were not only asked of the groups of women who participated in the food consumption interview, but were included in some of the general village level questions directed primarily at men. These data thus give some insight into gender differences in food preferences.

Food preferences are a more complex issue than it might initially appear. Preferences are not simply a matter of taste, but are affected by a variety of factors including supply, cost, preparation time, variety of dishes, and cropping strategy. Supply, in turn, is not only a function of what the farmers grow, the size of their harvests and how long their grain stocks last, but also the extent to which foods are imported from outside the region, and thus their availability for purchase. Our impression was that the shorter a foodstuff was in supply, for whatever of the reasons discussed above, the more likely it was to be preferred. This may explain the common preference for millet which is the scarcest grain especially at the time of the survey in October. Other reasons for preferring millet are discussed below. This may also explain the general preference for meat over fish, since meat is eaten much less frequently. These same tendencies were also noted in the food consumption survey in Mauritania (Stone et al. 1986).

The more traditional grains, millet and sorghum, were those most commonly preferred. In some villages, sorghum (the same variety) was preferred (Gamadji) although millet was the most commonly mentioned (Agnam Goli, Meri, Mafre Decore). One reason cited by women for preference of these grains over rice or maize is that more food per unit of unthreshed measure is produced with these grains than with rice (Gamadji, Tyikkite). They also noted the versatility of preparation: a wider variety of dishes can be made from sorghum and millet (Gamadji, Agnam Goli). Many people also prefer the taste of these grains (Gamadji, Mafre Decore, Daka Ouroulbe).

Millet is also valued because it goes well with dried fish, which is the most common form of animal protein eaten (Agnam Goli). The women of Agnam Goli felt that the varieties of sorghum (same, fellah) went better with fresh fish or meat. Millet can also be eaten without either fish or meat, unlike rice, and so is more economical (Meri, Tyikkite). Some families eat the evening couscous plain if they cannot afford other ingredients (see strategies to deal with food deficits).

One group of village women stated that they used to prefer millet but since it has been in such short supply in recent years, they have changed their preference to sorghum (Dieri Douga). Others had the opposite reaction to the scarcity of supply noting that millet was their traditional staple and thus they preferred it out of habit (Meri, Agnam Goli). For farmers, millet also has good associations with times of abundance (Mafre Decore).

Several villages associated specific cereals with specific meals. Most commonly, rice is preferred at the midday meal and sorghum and millet for dinner (Dondou, Abdallah Walo).

Preparation time affects food preferences, but there was not complete agreement on which cereals were the most time consuming to prepare. Everyone agrees that rice is the fastest to prepare (excluding time spent on threshing paddy) and that maize is the most difficult to process. Beyond that, however, some women said that sorghum and millet take the same amount of work (Dieri Douga), some that millet is more difficult to prepare than sorghum (Diobe), or some said the opposite that sorghum takes more time (Meri). Women in Diobe said that some cereals do take more preparation time than others, but they did not consider this as important a consideration as availability.

Some villagers valued variety in their diet, and so expressed no strong preference for any one cereal. Maize is considered difficult to process and pound but is still liked for its taste and eaten in a variety of forms (couscous, gniri, bouillie) even in villages without power mills (Ngoui).

Taste preferences seem to vary by age and as a result of contact with urban taste preferences. The young express a preference for rice while the older people generally prefer millet or sorghum (Agnam Goli). Given the high incidence of temporary rural–urban wage migration, the identification of the young with urban lifestyles is not surprising.

Meat was generally preferred over fish. The smaller villages without butchers only eat meat on special occasions (Meri) and even where meat can be purchased, it is more costly than fish. Most villages eat fish daily, and those whose source is primarily dried fish expressed a strong preference for fresh fish (Ngoui). Villages composed primarily of fishermen much preferred fresh fish over both dried fish and meat (Ngoui). Others valued the variety (Dabia Odedji).

Villagers in Mafre Decore, whose principal activity is herding, told us that they much preferred meat over fish. However, since eating meat requires killing an animal, they preferred to eat fish. Their desire to rebuild herds decimated by drought thus was stronger than their food preferences.

Some gender differences in preferences were noted. The women of Dieri Douga and Gamadji preferred meat while the men preferred fish. This may be influenced by the fact that men are commonly responsible for providing the more expensive meat to the family, while women regularly acquire fish as one of their daily purchases. The women of Gamadji stated a preference for sorghum, while the men preferred millet. These women thought that sorghum yielded more food per measure of grain than did millet (and consequently more food per unit of processing time). The role of women in grain processing and cooking may thus affect their preferences.

The relative importance of remittances, accessibility of villages to transportation, the presence of rice perimeters and power cereal mills are parameters which distinguish villages, and which might have interesting effects on food preferences. It is difficult with our data to analyze these factors fully and they deserve further study. A few suggestions which emerged from the study are discussed below.

In general, what a family eats in the present situation is determined by what members can afford to buy, not what they can grow. The amounts and frequencies of remittances, which vary more between households than between villages, has crucial effects, therefore, on what the family eats. Given the limited range of

goods available for sale, however, the relatively prosperous family eats more of the same foods as the poor family, not different foods. Almost universally, the food people would buy if they had more money is meat, and the richer households can more frequently fulfill this preference. If a food is seasonally unavailable in the market, such as millet in October, no one eats as much as they might like.

As discussed below under marketing networks, no villages are completely cut-off from access to food markets, and so this distinction does not seem to translate into differences of preference. Similarly, the presence of rice perimeters seems to have no effect on preferences, since all villages have easy access to rice. Women do not seem to count their food preparation time as an important consideration in determining what they prefer or what they cook. The presence of power mills does not, at least on first study, affect preferences.

B. Food Marketing Networks and Purchases

A significant portion of the food eaten in most villages is purchased. This is especially true after stocks of cultivated cereals have been depleted. For many households this period covers more than half the year (see food storage). Despite the fact that an all-weather road exists through the study region, the market structure is such that a relatively narrow range of foodstuffs reaches most villages.

Rice is available for purchase in virtually every village throughout the year. Although some of the rice consumed has been grown on village perimeters, much of the individual farmer's rice is used to repay debts, to recompense relatives and friends who contributed labor to rice cultivation, and sold or exchanged for other necessary ingredients (Gamadji, Dieri Douga, Diobe, Agnam Goli, Meri). Despite the fact that rice is more expensive and requires more condiments than other grains, its widespread availability must explain, at least in part, the frequency with which it is eaten.

Sorghum is the next most commonly sold grain, although supplies were low at the time of the survey in October. There was no millet at all in most villages, and none was seen for sale in village markets. The diminished supplies of sorghum and millet reflect primarily the poor harvests of the preceding years. As with rice, some sorghum and millet are sold locally to enable the farm family to purchase other foodstuffs. Unlike rice, however, little of these grains is imported from outside the region.

The most actively traded and universally available foodstuff is fish. Fish, especially dried fish, is for sale in virtually every village throughout the year. Because of the great decrease in river fish, almost all the fish marketed is sea fish coming from Dakar and St. Louis. Villages which are situated near the main road are able to buy fresh sea fish on an almost daily basis from the trucks traveling eastward (Tyikkite, Gamadji, Boki Diave, Dabia Odedji). Some women specialize in this fresh fish trade and spend the night next to the road to purchase baskets of fish for resale the following morning in the village market. Villages situated well south of the road in the dieri (eg. Mafre Decore) travel to the road to buy fish as well, but are confined primarily to dry fish because of distance and perishability.

Other non-perishable goods which are widely available include cooking oil, sugar, tea and powdered milk. Various spices such as black and red peppers, maggi (bouillon cubes), and dried sauce leaves are also for sale in most villages. The only

vegetables which reach most villages with any regularity are onions and tomatoes (usually concentrated) although during the dry season when vegetables are locally cultivated, a much greater range is available.

Even when a village lacks a formal market or stores (boutiques) the goods listed above are usually available for sale by petty traders selling out of their houses. In these situations, there may be periods when goods are unavailable in the village and women are forced to travel to neighboring markets to purchase foods. In some cases, especially the villages situated on the river, this may require a boat trip during the rainy season (Salde, Abdallah Walo).

Larger villages are often home to a butcher, and so meat can be purchased by the kilogram (Boki Diave, Dabia Odedji, Diobe). Those villages too small to support a butcher, eat meat very rarely and often only for special occasions such as the festival of tabaski or for baptisms, etc.

Rice, fish, oil, and tea were mentioned as the most frequent daily purchases. Most women can afford to buy only enough food for the daily ration, and so food shopping is part of their daily routine. Some families, however, who "wake up without a penny" must go some days without making any purchases (Dieri Douga).

Few families can afford to purchase in bulk. In Dieri Douga, the women said that some households are able to buy sacks of grain rather than a few kilograms at a time. However, none of the group of women interviewed knew the price for whole sacks, leading us to believe such purchases must be rare and confined to a few individuals. After harvest, bulk purchases are more common. By October with diminished grain supplies and dependence on grains brought in from outside the area, they are very rare (Diobe). No goods besides grains were ever cited as purchased in bulk. For some families, the purchase of a whole kilogram package of tea represents a bulk purchase (many buy tea by the small tea glassful). This illustrates not only the small scale but the daily precariousness of many families' food budgets.

C. Meals and Food Preparation

There is little variation between villages in the dishes eaten or in daily menus. Specific ingredients vary by availability, but the basic recipes are similar across villages and seasons (Table 2).

Most women reported eating three meals a day, although they generally cook only twice a day. The morning meal, which is usually eaten between 8 and 10 a.m., is the most varied. Some families eat bread with coffee, milk and sugar (Dabia Odedji, Agnam Goli, Meri, Ngoui, Gamadji, Dieri Douga, Diobe, Tyikkite, Daka Ouroulbe, Bode Lao). This, however, is an expensive meal and bread is not available in every village. Some families drink tea instead, and may prepare quinqueliba, a tea which can be gathered locally or purchased inexpensively (Agnam Goli, Gamadji). The milk may be powdered or fresh depending on availability. Families who keep their own goats may milk them in the morning for the breakfast meal (Daka Ouroulbe).

Others make a breakfast of leftovers from the previous evening's couscous. This may be served with fresh milk or leaf or meat sauce, but if the family cannot

TABLE 2

DISHES, INGREDIENTS, PREPARATION

BASIC HIERARCHY

Dish (Pulaar)	Description	Preparation Technique	Ingredients	Cereals	Preparatior
Gossi	Grain porridge	Boil whole grain	Grain, sugar,milk	Any (suited to maize)	Little
Gniri	Cracked grain	Pound grain coarsely and boil	Grain and variety of sauces	Any	More (can combine w/ couscous)
Couscous	Steamed flour	Pound grain into flour	Grain and variety of sauces	Any (rarely maize)	Several hours unless mill
Bassi	Very fine couscous	Continue pounding	Grain, sugar, milk	Any but not with hard kernels	Most

OTHER DISHES

Mafe: Different types. Often feature peanut, fish and okra sauce served on rice or porridge.

Bouillie: Liquid grain porridge

Zrik (Toufam): Milk mixed with water and sugar

Laru: Gniri mixed with hibiscus, fish and salt

Thieboudjen: Steamed rice with sauce of vegetables and fish

Yaninongo: Pounded cereal and cowpeas boiled together

Nire: Boiled cowpeas

afford these ingredients they can eat couscous plain with water and sugar (Agnam Goli, Ngoui, Meri). This meal takes minimal preparation time. Some women serve a sort of porridge called gossi in Pulaar (sombi in Soninke) which is the whole grain boiled with sugar and milk (Boki Diave). Gossi can be made from any cereal including rice, maize, sorghum or millet. Although the grain must be cleaned, it does not have to be pounded or ground for this dish, making it practical as a breakfast food. As with couscous, gossi may be served plain if the family cannot afford sugar or milk.

The midday meal takes two basic forms, and may be eaten as early as 1 or as late as 4 p.m.. Many families eat boiled rice dishes for lunch, while some prepare a dish known as gniri in Pulaar. Rice requires some sauce, minimally some oil and spices, but usually is served with fish, either dried or fresh as well. Other condiments may include canned or fresh tomatoes, maggi cubes, red and black peppers, vinegar, hibiscus leaves, etc. Some rice dishes are named and have more fixed recipes. Mafe is a rice dish in which the sauce is cooked separately and features okra and/or peanut sauces.

Gniri is a boiled cereal dish which is made with cracked rather than whole or pulverized grains. Gniri can be made with any grain and thus varies by availability. The preparation of the midday and evening meal can be partially combined in one process. A first pounding in the morning results in incompletely processed flour. The cracked grains are sifted out and prepared as gniri for lunch, while the finer flour kept for the dinner couscous. Gniri is served with a variety of other ingredients. Gniri buna is common and features dried fish. Gniri may also be served with fresh fish (gniri lidi), milk (gniri kwassam), melon seeds (beref), cowpeas, oil, or some combination. Gniri requires fewer extra ingredients than does rice and so is a more economical meal than is rice (Dieri Douga). Some gniri dishes have special names and more fixed ingredients. A dish known as laru is gniri mixed with hibiscus leaves, fish and salt.

Dinner is usually eaten between 8–10 p.m. Almost universally, the evening meal consists of couscous with a variety of sauces. Couscous is steamed flour made from the whole range of cereals including rice, sorghum, millet, maize and the wild grain paguiri. Couscous, like gniri, is served with fish, both fresh and dried, meat, sauce leaves, peanuts, oil, tomatoes, milk, and beref. If the family cannot afford sauce ingredients, couscous can be eaten plain with salted water (Gamadji, Dieri Douga). The couscous itself requires the addition of baobab leaves (lalo) which are said to make the couscous easier to swallow and more palatable.

Some inquiries were made into long–term changes in the diet. Villagers were asked which dishes were no longer eaten since the drought, and which dishes are new. In general, women noted the decrease in milk and butter supplies as well as in river fish. More recent additions to the diet and substitutes included ocean fish, powdered milk, peanut oil and rice dishes (Dieri Douga, Diobe, Mafre Decore). For example, one dish which is less commonly eaten today is gniri meri or gniri with butter. Dishes featuring cowpeas are also less commonly prepared than previously, reflecting the scarcity and high cost of cowpeas. Women said that in the past, cowpeas were treated more as a grain, whereas today they are eaten primarily as a sauce ingredient. So a dish such as yaninongo which is made of boiled cowpeas and pounded cereal is infrequently eaten (Ngoui).

The basic regimen followed by most families is thus well adapted to variations in the availability and affordability of ingredients. The same basic dish may be prepared with a minimum of ingredients, limited to the grain itself, or with a whole range of condiments. This allows flexibility in both the long and short runs, to react to fluctuations in food availability by season, income and competing demands for women's labor.

D. Food Storage and Depletion of Food Stocks

The methods of grain storage vary not only by cereal, but by the size of the harvest and the proportion of the harvest marketed. In the past, grains were stored in special storage huts called sak. Sak are small round huts with raised wooden floors, woven stick walls and thatched roofs. Although sak are still seen in some villages, we were told that they are no longer routinely constructed because the harvests are not large enough to warrant them. According to the women in several villages (Dieri Douga, Diobe), the sak were more impervious to insect and rodent damage than are present storage methods. The heads of the sorghum or millet were individually laid into the sak in a criss-cross pattern making it difficult for pests to penetrate the stores. Another traditional storage structure, the fauru or mud granary is also less commonly built in the current era of greatly diminished harvests.

Nowadays, most grains are simply stored inside houses, either lain on the floor (sometimes on wooden platforms) or inside storage bins or bancos. Some families process all their grains at once and store them in sacks, but most leave the sorghum and millet on the stalk and the women process these only as needed for consumption or sale. Bulk processing is often done when grains are intended for sale. Rice is often handled this way, with threshing and winnowing completed shortly after the harvest. Rice is also the most commonly sold crop.

Grains stored inside houses are prone to significant pest damage. Although it is difficult to judge what proportion of the harvest is lost to pests, one can say that the villagers themselves consider it a serious problem; whatever is destroyed is too much in an area characterized by precarious food supply.

Most commonly mentioned pests were termites and rats (Dieri Douga, Diobe, Dabia Odedji, Ngoui, Meri, Bode Lao), but cowpea weevils are also a problem (Agnam Goli, Ngoui). Farmers have some techniques for protecting their stocks, but they do not consider them very effective. The use of insecticide dusts was considered the best method, but most families cannot afford them or cannot find them to purchase (Dabia Odedji, Bode Lao, Tyikkite). One village was receiving some HCH from SAED, but villagers said they did not have enough. Some households keep cats or set mousetraps against rodents; others said they merely "beat the mice with a stick" (and laughed at how futile this was). Termites are controlled by frequent turning and checking of the bags. If termites are found they are picked and swept out of the grain (Agnam Goli). Cowpea weevils can be controlled by placing the cowpeas in a sealed jar mixed with ashes and sand (Ngoui).

Virtually all households had depleted their cultivated grain stocks from the previous year's harvest by the time of the survey in October. The number of months that grain stocks last varies significantly, however, from one household to

another. Depletion of stored grains is more a result of the portion the family must sell or exchange in order to buy other foods, than the proportion which they eat. Some ran through their stocks within a month of the harvest because of this (Dabia Odedji, Ngoui) while others managed to keep stocked grains for at least six months. Over half of the rice harvest may be sold to buy other ingredients (Diobe). Some households had managed to keep enough seeds for the upcoming walo planting, but others were purchasing their seed grains (Dieri Douga, Diobe). The average number of months kept in storage seem to be two to five for both rice and sorghum.

E. Free Food Distribution

None of the villages surveyed had received any food aid during the past year and some had not received any for two or three years. When food aid was delivered, it apparently averaged 2–3 kg. of grain per person, although one village reported that as much as 10 kg. were received per person.

Some villages have child feeding programs in place (PPNS). The village of Ngoui for example receives food for their program about once a month. Although in the past, the food was cooked cooperatively, each mother is now given a certain amount of food depending on how many children she has between the ages of 3 months and five years she has. Each child is alloted 4 kg of cereal, 1 liter of oil and 2 packets of milk powder. It is not clear that the food would necessarily be used to feed only the children.

Other women seemed to be unhappy with the management of the PPNS. We were told by the women in one program that each child must be weighed monthly for eight months before they can be accepted into the program. The mother pays 200 CFA each of these months, without receiving any food. At the end of that period if the child is considered underweight, the mother can, by paying an additional 200 CFA per month, receive 4 kg of cereal, 1 litre of oil and 2 cartons of long-life milk per child. The women did not consider the program worth the time or expense, so many of them were not participating. We were not able to confirm their complaints.

F. Wild Foods

Wild foods can take on special importance during hunger periods, whether seasonally between harvests, or over longer periods of drought. Unfortunately, the environmental conditions which have affected cultivated output also tend to diminish the natural flora from which foods can be gathered. In the river valley, where many of the wild foods are collected from trees, availability has also been compromised by deforestation resulting from firewood collection and charcoal making. Many villagers noted that the supply of wild foods had greatly decreased with the drought, and that they had to travel longer distances to find them.

Wild fruits were being gathered at the time of the survey in October and continue to be available until December. The most commonly mentioned was the fruit of Ziziphus mauritania (jaabe in Pulaar and jujube in French). The small orange fruits are eaten especially by children, but the tree also has medicinal uses. Balanites aegyptiaca (murtode in Pulaar, mureau blanc in French) also produces small

yellow fruit, yields soap from its nuts, and is used medicinally. Boscia senegalensis (guidjile in Pulaar) is also a fruit tree. Some women said they were going out morning and night in October to collect these fruits (Ngoui). When asked which wild foods were preferred, most women mentioned these fruits, noting that these are the only fruits they eat (Meri).

Another shrub which is commonly used is the quinqueliba. Leaves are brewed into a tea which is drunk by families who cannot afford to purchase Chinese green tea.

The other major category of wild foods are leaves used in sauces. Most frequently mentioned and most abundant is Cassia tora (oulo in Pulaar). Oulo is gathered and eaten virtually every day in the early rainy season. By the time of the October survey, most families were eating haco (leaves of the cowpea) instead. Other wild green leaves which are eaten include tupere, sappato, and tireo.

Some wild tubers and grains are exploited. One water plant, Nymphaea lotus, was frequently mentioned and is available in the early rainy season. The root resembles a potato (tabbe in Pulaar) and the flower produces an edible seed (dayrrii in Pulaar). In recent years, the marshy areas where this plant grows have often been too dry to produce the water plants.

Most wild products, especially the fruits, enter the market place, although many women collect them solely for household consumption. Some products are less available to villages living in certain zones of the river valley (river, marigot, dieri) and so products are sold or exchanged between these zones. Quinqueliba, for example, grows in the drier dieri areas and so is brought down to the river villages for sale by nomads (Ngoui). In turn, the river villages have access to more abundant supplies of other products, such as oulo, and bring them to the dieri villages (eg. Agnam Goli) for sale or trade. These microenvironmental differences thus stimulate an exchange of wild products.

The most actively traded products are those of the baobab tree. The baobab produces a fruit (pain de singe in French) which is eaten and used to treat diarrhea. The leaves of the baobab (lalo in Pulaar) are especially valued as an ingredient in couscous, and the bark of the tree is used to make cord. The number of baobabs has greatly decreased in this region in the drought years, and many villages have no access to the trees (Diammel, Gaol, Nabadji, Dabia Odedji, Dounguel, Meri, Diobe, Agnam Goli), while others must travel long distances to find baobob (Gamadji, Dieri Douga). Some baobabs are individually owned (eg. the village of Ngoui has only two trees both belonging to one man) while others are open to public access (Goudoube Ndouetbe). Because of the high demand for baobab products, they are imported into the region from as far away as the Casamance through Dakar.

The wild grains include brachiaria hagerupii (paguiri in Pulaar) and Digitata exilis commonly known as fonio. Paguiri is a particularly important wild food because of its widespread availability and its substitutability for cultivated cereals. Yet attitudes about gathering and eating paguiri revealed some ambivalence. It is thought of as a hunger food, and associated with the very poor. Poorer families may collect as much as one sack in a year (Ngoui), although many people gather only a few kilograms at a time when they have run out of other grains (Meri).

Young girls may also collect the grain, which implies that it is not worth the time of adult women (Agnam Goli). Paguiri has the added disadvantage of being difficult to process and pound. Nonetheless, many people like the taste of paguiri (Ngoui), and collect it for variety in their diet. A few villages no longer can find paguiri in their environs and miss it (Dieri Douga, Diobe).

Despite, or perhaps due to diminished supplies of wild foods, they retain their value along the river. The wild fruits and leaves are still virtually the only source of fresh foods and vitamins throughout much of the region and the year. European vegetables are available during the cool dry season, but no other fresh foods are available in the fall and winter months when the wild foods are producing. If the vegetable growing season were extended, the importance of gathered products might diminish. The strong preferences for wild foods that were expressed make it more likely, however, that they will continue to be important and that replanting of these useful species would be welcomed. The villagers of Abdallah Walo, for example, made a special request of a forestry project for wild fruit trees (Ziziphus mauritania and Balanites aegyptiaca).

G. Seasonality of Foods

One effect of the well-developed road network along the river has been to diminish seasonal variation in diet. Many of the staples including most importantly rice, fish and oil are available year round. What seasonal variation persists is thus more a function of the individual household's harvests and ability to purchase foods at different times of the year, than a lack of supply.

The depletion of stocked grains by about June of each year means that until the dieri and rice harvests in the fall (October-November), a serious shortage of locally grown cereals occurs in the summer months. Almost all villages mentioned the scarcity of grain, as well as cowpeas and peanuts, during the October survey.

Vegetable growing is confined to the cool dry months between November and March. The rest of the year, very few vegetables are imported into the region although onions and peppers are trucked in from the coast (Dabia Odedji, Agnam Goli, Ngoui). Some of the larger villages were also receiving other vegetables such as tomatoes and eggplant in October (Dabia Odedji).

Many women noted that although most foods were available for sale throughout the year, their cost varied widely and thus made them beyond reach during certain months. The women of Boki Diave, for example, reported that sorghum (same) cost two and a half times as much in October than it did after the harvest (125 CFA/kg vs 50 CFA/kg). The price of cowpeas is similarly variable. Although some can be purchased in October, its price is so high that no one buys it to eat, but only for seed (Dieri Douga).

In contrast to Mauritania, the villages surveyed in Senegal do not experience as serious a shortage of fish during the rainy season. Most villages, especially those along the main road, have access to both dried and fresh fish from the coast every day (eg. Boki Diave, Dabia Odedji). Even the villages cut off from the road during the rains can travel by boat to nearby towns and acquire fish on occasion.

Milk is most abundant during the rainy season and so milk consumption goes up during these months. Some of the fish sellers noted that the demand for fish drops during the rains because people are drinking more milk (Ngoui, Meri). Powdered milk is widely available and can substitute for fresh during the dry season.

H. Food Prices

Price data on some of the more common foodstuffs were collected in the villages included in the food consumption survey. Price differences between villages can give insights into the workings of the regional market, including the effects of the size and relative isolation of individual villages. The relative ease of movement between most villages, however, minimizes the potential effects of price differentials. Paying a higher price in a smaller village reflects a lack of time rather than a lack of alternatives. The middlemen or women can thus take advantage of these time constraints.

Certain goods show more variation in price from one village to the next than do others. Interestingly, locally grown grains seem to have a more stable price across villages than do imported products such as oil, sugar and tea. This is true despite shortages of these grains at the time of the survey in October. The prices may well be high across the board for these grains, because of overall scarcity, while the imported products, which are less affected by seasonal fluctuations in supply are more responsive to such economic factors as village size (demand) and location (transport costs). Confirmation of this hypothesis, however, requires seasonal price comparisons which could be provided by a dry season reconnaissance survey.

Sorghum prices, thus, were remarkably similar across markets, and was selling for 125 CFA/kg in all but two of the surveyed villages (Ngoui, Meri). Most villages had no millet available for purchase. Curiously, where millet was available the price was the same as for sorghum (Boki Diave, Dabia Odedji). Melon seed also sells for a standard price (125 CFA/kg.) in virtually every village. Cowpeas are very costly and rare with prices as high as 150 CFA for a small tea glassful.

Just because a village is small or off the main road, does not necessarily mean that it will pay higher prices for all foodstuffs. The village of Ngoui, for example, (population of 652 people) does pay the highest price for cooking oil (500 CFA/liter) but pays the lowest listed price for sorghum (100 CFA/kg.). The much larger village of Gamadji (population of 2000 people) pays much less for its oil (425 CFA/liter) but more for sorghum (125 CFA/kg.). The same pattern holds true for sugar prices. In general, locally produced goods show less variation in price than do imports, but when sold within small villages they may command lower prices relatively. Imported goods may cost more in smaller villages, but similarly, goods which do not get out of the village may cost relatively less.

Prices for basic commodities are fixed by the state, yet the parallel market is an active one. The official price for meat for example, at 350 CFA/kg is about half of what meat is sold for in the surveyed villages. This is an extreme example of markup, however, and most goods show less variation from official prices. The price for cooking oil, for example, is set at 400 CFA/liter in Dakar and most

villages spend between 425–500 CFA/liter for their oil, a difference of 20–25 percent rather than 100 percent. Rice, similarly, has an official price of 165 CFA/kg in Dakar, and was selling for 180–200 CFA/kg in the villages. This relatively small markup in the price of rice confirms the findings of Morris (1986).

Comparison of prices for goods which are sold by the pile or item rather than by weight are more difficult. This applies not only to fish, but to condiments such as onion, tomatoes, and peppers. In general, a pile of three small fresh fish cost 100 CFA, although some villages paid the same price for a pile twice that size. The prices for dried and fresh fish are not as different as one might initially suppose, but dried fish of course goes much further in cooking than does fresh.

Powdered milk prices are very high, costing from 500–1000 CFA/kg depending both on quality and supply. The supply of fresh milk was said to be greater during the 1986 rainy season than it had been in the past few years. Fresh milk prices were thus quite low (125 CFA/liter). According to the milk-selling Peuhl of the village of Mafre Decore, in 1985 they had sold their milk for as high as 1000 CFA/liter. A significant proportion of the milk supplies are traded rather than sold. The exchange rate has generally been equal volume measures of milk and cereal, reflecting the shortage of grains as well as milk.

I. Specialty Foods: Childbearing Women, Infants and the Sick

Few specialty foods exist for childbearing women or their infants. Certain dishes from the normal repertoire are considered more appropriate than others, but in general, since ingredients are limited and time spent in food preparation is already burdensome, few separate foods are prepared.

Porridges are used widely as weaning foods, given to children of non-lactating mothers, and the sick, as well as to women who have just given birth. These usually take the form of bouillie, but may also be the more liquid ruiz or the ground form of bouillie called gossi. Milk is also fed to all these categories of people. In general, any available cereal is used to make these porridges but some women expressed a preference for rice for the small infants (Dabia Odedji, Ngoui). Some women use eggs as a weaning food (Boki Diave), disregarding the traditional taboo against feeding eggs to children.

After childbirth, women are given soups with chicken or meat. The meat is provided by the husband if he can afford it. A well-to-do husband kills a sheep at the time of the birth (Meri). If he cannot, the woman eats everyday food especially bouillie and gossi. Some women make a special point of drinking milk at this time (Meri), others drink hot water or quinqueliba tea (Agnam Goli, Ngoui). Women return to work anywhere from two weeks to two months after childbirth. This depends primarily on the demand for the woman's labor, but also on her own and the baby's health.

Children are generally weaned at 18 months, although some are weaned much earlier if the mother becomes pregnant again, or as late as 36 months (Ngoui). Some children apparently lose interest in breastfeeding before the normal age of weaning (Dieri Douga). Weaning is usually done very abruptly, often in a single day. The child may be taken to a marabout to be administered a potion (Tyikkite),

the mother may rub sand on her breasts (Bode Lao) or the child is given to someone else for a few days. Most mothers have begun supplementing breastmilk by about 6 months (or whenever the child can sit up) with the weaning foods discussed above or with small portions of adult foods. Others, however wait until the child is weaned. The mothers of Dabia Odedji used to withhold supplemental foods from their children until they were given adult food at two years of age. They have been told at the local medical center, however, to start feeding them milk and ruiz earlier. Children of non-lactating mothers used to be given to a wet nurse, but now more commonly are fed fresh milk and ruiz with a bottle (Dabia Odedji, Ngoui, Diobe).

Most women agreed that food taboos were beliefs of the past, and that today only the Moslem prohibitions against eating certain meats are still followed. When asked what foods were tabooed to pregnant women, people most commonly answered none, but sometimes they mentioned foods that are no longer part of the diet. Several groups of villagers said, for example, that crocodile meat was tabooed to pregnant women because it was thought to cause sexual problems in the child (Boki Diave, Dabia Odedji, Meri). Others mentioned that rabbit meat was tabooed because it is a bloody meat and thought to cause excessive bleeding during delivery (Dabia Odedji). One group of women said that in the past they did not eat couscous at all during pregnancy, but only gossi or bouillie, for fear of harming the child. Now the doctor tells them to eat everything, but to avoid too much salt. Similarly, there are no longer any foods tabooed to children.

J. Diseases and Health

The most commonly mentioned diseases were diarrhea, measles, conjunctivitis and malaria. Other less commonly mentioned sicknesses included coughs and colds, fevers, schistosomiasis, muscle and stomach aches and fatigue.

Diarrhea is a common problem throughout the year, but is especially troublesome at the change of the seasons and when children are weaned. The women of Diobe said that many children die at the age of weaning. In one village, women said they had particular trouble with diarrhea caused by the milk from the free food distribution (Tyikkite). This may well be true, if they are using contaminated water to mix the milk. Most women take themselves and their children to the local medical center when a severe case of diarrhea occurs, and have stopped using traditional remedies. The women of Boki Diave said that in the past they used to treat diarrhea with medicines from wild plants, but that many children died. Some traditional remedies are still in use including drinking tea made from the leaves of the Ziziphus mauritania or the leaves of the baobob. At the medical centers, women are sometimes taught how to make oral rehydration fluid (Meri).

Most other health problems are also best seen as treated by infirmaries and medical centers. Some people still use traditional treatments such as Balanites aegyptiaca for stomach aches (Agnam Goli, Meri), honey for coughs (Agnam Goli), or various "leaves" to reduce fevers (Ngoui). Less common nowadays, but still practiced, are the slits cut next to the eyes to treat conjunctivitis or slits cut in the forehead to reduce malarial fevers.

Of the twenty–two villages surveyed, six had operating clinics or dispensaries (Diammel, Dondou, Salde, Boki Diave, Bode Lao, Meri). Several other villages had dispensaries which were under construction or constructed but unstaffed (Dounguel, Abdallah Walo, Nabadji Siol, Gamadji). All of these villages are either along the river or in the marigot zone; none of the dieri villages surveyed have any medical facilities. These villages, of course, tend to be smaller.

III. WOMEN'S FARMING AND OTHER PRODUCTIVE ACTIVITIES

In a region characterized by high rates of male out-migration, both seasonal and long-term, women are the most permanent rural residents and constitute an important source of labor. According to the women themselves, their labor input into agriculture has increased over recent years and has become especially important on the irrigated parcels. Toucouleur women in the past played a minor role in farming, supplementing male labor only occasionally and during such labor intensive tasks as sowing and harvesting.

Most of the Toucouleur women today still contribute only marginally to agriculture if the male household labor force is adequate. Women who are widowed, divorced or have become household heads for other reasons, however, can take complete charge of agricultural production.

The majority of women thus help on their husband's dieri and walo fields. Women are involved in the planting (often dropping the seeds into prepared holes), participate in the harvest, and transport and process the crops. Some women take charge of the crops intercropped with the cereals, principally cowpeas and melons in the dieri. The women of Ngoui, a village with access to relatively extensive walo land, plant a whole range of crops on the walo lands. They cultivate sweet potatoes, tomatoes, hibiscus, cowpeas, okra and a range of different melons. Sweet potatoes are propagated with cuttings and started, along with tomatoes, in small seedbeds around the compound. These seedbeds are carefully tended, watered twice daily, shaded and fenced. The attitude that walo land is exclusively for males was expressed in only one village (Diobe), although this was apparently more widespread in the past.

Some women are given a small portion of their husband's fields to cultivate separately, although with the reduction in arable land due to the drought, there is generally little land to spare from household production. Some women who used to farm have moved into trading in response to the restricted opportunities open to them in agriculture (Meri).

Widowed women usually farm land which they have inherited from their husbands, while divorced women must borrow land from their natal family. They tend to follow the same farming and cropping strategies as men, planting millet, cowpeas, melons and hibiscus on the dieri land, and sorghum, cowpeas and maize on the walo (Agnam Goli). They may face serious labor constraints if their children are small, or if they are alone. Some women who are receiving remittances from absent males can afford to hire labor to help with the farming. Other women chose to stop farming and use remittances to purchase food (Dabia Odedji).

Some women in the surveyed regions have their own rice parcels, but most contribute importantly to the transplanting and winnowing of rice produced on the household plot. Women can supplement their incomes by working on relatives' or neighbors' parcels, for which they are paid 1000 CFA per day or 12 kg. rice (Diobe, Dieri Douga). Payment for their work may be delayed until the rice is harvested. This form of wage labor available to women may be especially important to female household heads, as demonstrated in the following case history.

A. Case History of a Widow

Fatimata (pseudonym) is a woman in her thirties who has been recently widowed. She lives with her four young children, all under the age of 13, and her widowed and sick mother. Her eldest son, who is twelve, goes to school and so cannot help very much with his mother's farming. Fatimata inherited a field in the dieri as well as one in the walo. She does not have the labor to farm the walo field so sharecrops it to a neighbor. The walo field has been poorly flooded in the last few years, however, so she has received virtually nothing from its harvest. She planted her dieri field this year in melons and cowpeas, but the crops received too much water and so rotted, leaving nothing to harvest. Fatimata has no rice parcel of her own but worked on two relatives' parcels in return for a portion of the harvest. She helped with transplanting and harvesting and received from 8–12 kg of rice a day, although she must wait until the harvest is completed to receive her share. She uses this rice both to exchange for other foods and for consumption.

Fatimata has few other sources of income and depends primarily on the help of her relatives. She has already sold all her jewelry and other personal items of value, and owns no livestock. She collects wild foods when she has the time, and works in the village vegetable garden with the help of her children. The family eats only 1–2 kg. of cereal a day, and on some days when there is no grain, they "simply sit with crossed arms."

Women and children like Fatimata and her family are in a precarious position with regards to food consumption. They do not have reliable access to food supplies, and have few options open to them for generating income in the rural areas.

Other female heads of households, however, are in a somewhat more advantageous position in terms of access to land and can follow similar agricultural strategies as do male heads of households. The following case history illustrates this point, as well as the labor constraints under which many small households operate.

B. Case History of a Female Farmer

Talatu (pseudonym) is a 48 year old woman who has been divorced for ten years. She has four grown children, and her three sons are working in the Cote d'Ivoire (Ivory Coast). The remittances they send her are an important addition to her income. Talatu now lives alone and manages her own farming operation.

Talatu farms an irrigated parcel, a 3/4 hectare walo field in Mauritania, as well as owning 4 dieri fields. The walo and dieri fields were inherited from her father. This past year she planted only one of her dieri fields because all her children are gone and she lacks the labor to cultivate the rest. She planted her dieri field in melons, cowpeas and sorghum, but lost her melon and cowpea crops to pests and water damage. She chose to plant sorghum rather than millet this year because of the late rains, but only harvested half of a sack. She weeded this field twice by herself.

To cultivate her rice parcel, she must depend on the labor of others, whether wage or cooperative. She prepared the land herself by hand, and weeded it once

alone. The planting and transplanting, however, was done by a cooperative group of other women and boys taking turns working on each others fields. Of the 12 sacks of rice she harvested, three were paid to SAED, one was given to the people who helped her with the work, and the rest is for her to eat. Talatu used less fertilizer than was recommended by SAED because she could not afford it. She cultivates other crops around the edge of the perimeter including cowpeas, hibiscus, okra, eggplants and tomatoes. A second crop of maize is planted in late October and she consumes her entire maize harvest.

Talatu also grows vegetables and owns 4 goats, 2 sheep and a donkey. She sells the offspring of her animals for money, but must pay to have them cared for with the village herd.

Talatu views the major constraint on her agricultural activities as a lack of time and labor, rather than a lack of income per se. She not only noted the heavy work demands of her irrigated parcel (especially the building of bunds and transplanting), but also the conflicting demands with dieri cultivation. She expressed a desire to hire more labor to help her.

Other women, as mentioned above, have moved out of farming to engage in other economic activities in an effort to supplement family incomes. Petty commodity trading is the most frequent alternative occupation, but women also make crafts, dye cloth, and may own some livestock. The following case study of a fish seller gives some insights into the activities of female traders.

C. Case History of a Fish Trader

Mimouna (pseudonym) is a middle-aged woman who is a trader of fish and vegetables. She lives with her husband, a co-wife, her son's two wives and their 5 children, and 2 children of her married daughter. She concentrates primarily on fish-selling, since vegetable production is largely limited to the cool, dry season. Mimouna buys a large basket of fish every day from the trucks that come out of St. Louis. Although the supply is not completely dependable, variation in supply occurs on an annual rather than seasonal cycle. She primarily sells fresh fish, but may dry unsold portions for sale. The fish she buys are all sea fish and most are called aboye, a fish that is around 6 inches long. She sells fish by the pile, and averages a profit of around 1000-1500 CFA per day, although some days she makes more. Mimouna is willing to trade fish for other products including milk, cereal and cloth, but most of her fish are sold for money.

Mimouna works infrequently in the fields, although her co-resident husband has a perimeter parcel, and both dieri and walo fields. Mimouna says that she was forced out of farming by the poor harvests, and if the rains returned she would continue her trading but begin to farm again. She did plant some cowpeas and melons on her husband's dieri land this year, and can dispose of the produce as she likes. She also helps in her husband's walo fields by scaring birds. Otherwise, Mimouna uses some of the profits of her trading to hire people to help on her husband's fields in her place. She hires women to help plant (at a rate of 500 CFA for 6 hours of work), to help harvest and transport the crops back to the village. Men are hired for weeding; she pays them the same rate as the women. Mimouna does the threshing and winnowing herself, but takes the grain to the power mill

everyday for grinding. Mimouna uses some of her profits to buy condiments for the family, although the husband contributes money as well.

Mimouna has her own irrigated parcel in which she plants rice and maize. She hires people to help with the work as well as laboring herself. She plants her own seeds, and gets fertilizer from SAED. She does not sell any of her rice, but consumes the whole harvest.

The family is relatively well-to-do and Mimouna herself owns two goats. The five adults and 7 children eat 4 kg of grain, and 4 kg of rice per day (almost twice the amount Fatimata's family eats). When asked what the major problem in her village was, Mimouna talked about all of the women who are alone who must work their fields by themselves. The number of such women, she felt, had increased in recent times.

Although these are only isolated case studies, these three women illustrate some of the constraints which rural residents in general are facing, and women in particular.

IV. FOOD CONSUMPTION CONSTRAINTS AND RECOMMENDATIONS

The combination of factors discussed under the heading of Food Consumption Patterns has resulted in an increasing homogenization of the diet throughout the region. Reduced harvests, storage loss to pests, and the necessity of selling or exchanging foodstocks has diminished farm families' consumption of traditional cereals. The narrow range of goods which are imported into most villages is not substituting other foodstuffs for this restricted supply of grains. The decreased availability of wild foods has reduced valuable variety and nutrition in the diet. Wild foods are not being compensated by an increase in the consumption of Western vegetables except during the winter months. Highly variable supplies of fresh milk, and the high cost of powdered milk, have resulted in decreased consumption of milk products. Suspension of food aid throughout the region has eliminated another source of variety and dietary supplements. The high prices of certain foods, such as cowpeas, make them unavailable to many households.

The decreasing variety in the diet which results from these factors also entails a decrease in dietary quality for many families. A number of constraints which have caused this trend, and strategies used to deal with them, are discussed below. Preliminary recommendations including topics for further study are also proposed.

A. Food Shortages

Rural families are faced with food shortages due not only to scarcity of locally-produced foods but also to a limited number of imports.

Compensating strategies

1. Many families have greatly increased their consumption of rice in response to shortages in traditional cereals and to the widespread availability of rice.

2. Increases in rice consumption depend on money to purchase the grain. Most rural families depend importantly on remittances from immigrants. Some villages, however, noted that remittances were less reliable today than they had been in the past.

3. Alternative sources of rural incomes are pursued including agricultural wage labor, fishing, trading, craft and charcoal production, etc. In general, there are few sources of any but petty incomes.

4. Credit for the purchase of foods is limited in most villages. The more well-to-do families in the larger villages may be given as much as 10,000 CFA of credit from local merchants (Agnam Goli), but the poorer families in most need of credit can often not secure any (Meri).

5. Some food or money is borrowed from friends or relatives, but since many people in rural villages are in the same straits, their ability to help is often limited (Meri).

6. Many families have sold off their livestock to acquire money to purchase food. Women have sold their jewelry, clothing and any other items of value to generate income. Many families have nothing left to sell of this sort (Dabia Odedji, Agnam Goli, Ngoui, Meri).

7. Some families reduce the number of meals eaten in a day to conserve food, others simply reduce the amount or quality of food which is served at each meal. Some families may only eat at midday, others eat nothing in the morning (Ngoui, Meri, Agnam Goli, Dieri Douga).

8. Women may attempt to increase their collection of wild foods despite diminished supplies and the need to travel longer distances. The collection of the wild grain paguiri can substitute for the lack of cultivated or purchased cereals.

9. Despite the great decrease in river fish, villagers still exploit this source of protein. The use of finer nets in order to catch the smaller fish is common.

10. Many villages have attempted to start vegetable gardens to provide fresh foods and generate small incomes during the cool, dry season. Vegetable production has been hampered, however, by a lack of knowledge of basic cultivation techniques and simple inputs such as seed.

11. Farmers, especially women, make an effort to maintain the diversity of minor crops (eg. hibiscus, okra, melons) by intercropping them in dieri and walo fields, as well as around the edges and on the dikes in irrigated parcels. This spreads out the risks of inadequate harvests in specific crops.

Recommendations

1. Improvements in the market infrastructure are needed to increase the range of foods reaching rural villages. The promotion of the private sector, which the government has made one of its major goals, requires a better understanding of the constraints under which traders are operating. The distribution of cereals other than rice should be a special focus of investigation to build on Morris'(1986) focus on the parallel market for rice.

2. The necessity of selling very much reduced stocks of cultivated grains to generate incomes for the purchase of other foods works to the great disadvantage of farmers. The promotion of higher value cash crops such as peanuts and sesame would provide them a better rate of exchange, and help safeguard the farm family's consumption of traditional cereals.

3. Distortions in the market, and seasonal variation in prices, could be minimized with the creation of cooperative food boutiques. These could also address the lack of credit for the purchase of food. The boutiques created at Independence are no longer operating in the study regions. Taking the lead from villagers in Mauritania, small-scale coops could be encouraged, working through existing cooperative structures such as village vegetable gardens. These groups could buy cereals and other staples in bulk at times of the year of reduced prices and sell them back to cooperative members at times of scarcity. Simple techniques of pricing and buying could be extended through existing cooperative groups.

4. Efforts must be made to decrease storage losses to pests. The relatively recent changes in storage technologies have not resulted in improvements, but seem to have increased susceptibility to damage. Although the rural residents themselves would prefer better access to insecticides to confront this problem, the widespread use of chemical techniques might involve long-term health

threats. If the use of insecticides is to increase, extension on the proper and safe use of such products is essential. Alternatively, non-chemical methods should be investigated and promoted. Suggestions from other ethnic groups in similar environments (such as storage above cooking areas to take advantage of the smoke, or pit storage) might prove instructive.

5. The decrease in wild food availability could be addressed through reforestation programs, following the lead of the villagers of Abdallah Walo who specifically requested wild fruit trees in their woodlot. These projects might well be directed to women who are the prime exploiters of these products and the most permanent rural residents. A reforestation project in Dounguel has depended on women for the twice-daily watering of seedlings. Trees could also be grown near households where they could benefit from waste domestic water and receive intensive care and protection.

   Replanting of tree and other wild species might well be integrated into village level water conservation projects. Planting wild food trees around vegetable gardens could also be promoted. The trees could benefit from the watering of the vegetables, provide additional food products, act as windbreaks and provide shade which would then prolong the vegetable growing season.

   Replanting activities might well be organized as Food for Work Programs, under the tutelage of the Forestry Service. This would allow the distribution of much-needed food in the short term, while promoting longer-term solutions to the food scarcity problem.

6. The decrease in milk supplies over the long term could be addressed through the promotion of small livestock raising around the household. Although some villagers own livestock which are herded collectively, small livestock kept near the compound could provide milk during periods when the major herds are absent. Such wild human foods as paguiri or oulo could be promoted to serve as forage crops in good years, while reserved for human food during years of shortage.

7. Research could be directed at the minor crops such as melons, okra, hibiscus, etc., focusing on traditional varieties which do not require modern inputs. The planting of these indigenous crops in vegetable gardens in the off-season could also be pursued since they are adapted to a more prolonged season than are Western vegetables, can be preserved using existing conservation techniques, and have a well established market demand. Promotion of herbicide use on irrigated parcels should take into account the threat this could pose to crops planted around the margins.

B. Labor and Time Constraints

Implementation of many of the recommendations made in the previous section depend on the availability of women's labor. Any planned intervention, however, must be sensitive to the already heavy demands on women's time. With high rates of male outmigration women are often left to manage the family's farming operation. Even when migration is only seasonal, some men are migrating during the rainy season, when farm demands are high, leaving their wives and children to cultivate the dieri fields.

Aside from their productive activities, women's domestic labor burdens are high. Women in many households make 5–10 trips to the water source a day, which may require traveling some distance to the river or marigot. When well levels are low during the dry season, drawing water can be especially time-consuming and difficult. Firewood supplies are often limited and may be distant from the villages. Women often go out to gather wood daily, although men and children may sometimes help.

Hand pounding of grain is also very labor intensive. Many women pound twice a day for a total labor investment of at least two hours. If maize has to be processed by hand, it may take up to four hours to fully grind. Even when power mills are available, the initial steps of processing must be done by hand. The separation of the grain from the stalk, the removal of the outer shell and winnowing cannot be done mechanically in these villages.

Cooking is also done at least twice if not three times a day. The infrequency of preparing special foods for weaning or for the sick can probably be explained in terms of the time constraints.

Available labor time is also spent on other activities related to maintenance of the domestic group. Sickness, whether illness of the women themselves or their families, and travel time to infirmaries can make significant demands on women's time. Finally, the need to purchase some foods on a daily basis can consume a significant share of women's time.

Compensating Strategies

1. Women may reduce the time spent in food preparation by cooking fewer meals or preparing less time intensive recipes.

2. Women may obtain either by purchase or exchange, products such as firewood or wild foods which they could potentially gather themselves, thus decreasing their disposable incomes.

3. Women attempt to share the domestic tasks with other women within the household or with their children.

4. Women may withdraw their labor from agriculture, or decrease their input, by hiring wage laborers in their place or simply reducing the time alloted to farming.

Recommendations

1. Many of the grain mills in the villages both cooperative and private, were not operating at the time of the survey due to mechanical failures. The difficulty of keeping these mills running, including getting access to spare parts and fuel, was a common complaint. The women's cooperative of Dabia Odedji had already spent over 80,000 CFA in an effort to fix the communal mill, but it was still not operating at the time of the survey. Mill operators need to be taught some maintenance techniques at the same time as they are taught how to run the mills. Mills which are donated should be sent with a range of spare parts to increase the likelihood of them continuing to run (eg. Tyikkite).

Since women are the primary users of mills, and benefit the most from their operation, there is no intrinsic reason women could not be trained as mill operators.

2. The burden of drawing of water from wells could be alleviated with some simple technologies. Some women prefer to walk further to the marigot than to draw water from the overcrowded well. This can negatively affect health as well as being an inefficient use of the well. Even the supply of ropes and rubber buckets is limited in some villages (Dieri Douga, Gamadji). Simple pulleys could greatly alleviate the labor involved in drawing water.

3. Fuel efficient cookstoves could save on firewood as well as the time involved in collecting the wood. Stoves which can be fueled with crop residues as well as wood have been introduced into other regions of Senegal, and could be extended along with a package of simple domestic technologies.

4. The time lost to sickness should be better understood and addressed. Efforts at extending medical care throughout the rural areas are, of course, being made, but small and isolated villages will probably never be able to support a medical facility. Improvements in drinking water supplies and in the variety of the diet would have beneficial effects on health, but access to modern medicines will probably remain limited in the foreseeable future. The decline in use of the traditional pharmacopoeia is thus premature and unfortunate and warrants closer study.

C. Constraints on Female Farmers' Activities

Although the food consumption survey did not focus on women's productive activities exclusively, it did generate the indication that an increasing number of rural women are the sole providers for their households. Furthermore, women's ability to generate incomes is presently limited, and yet potentially crucial to the standard of living in the rural areas. Their access to agricultural lands, both rainfed and irrigated is also of potential interest to future research and extension programs, as are the minor crops which are primarily the domain of women. These trends and relationships deserve further study and confirmation.

Recommendations

1. If women are increasingly responsible for agricultural decision-making (whether or not as household heads), and assuming they may be operating under somewhat different constraints, and with different goals than male farmers, their activities and problems should be directly addressed. The lack of labor, for example, may be a more critical limiting factor for female households heads than for males. This implies the need not only for further study of women farmers of the region, but extension efforts directed specifically at women.

2. The extent of women's access to irrigated parcels in village perimeters is also unclear. If individual women cannot marshall enough labor to handle a plot by themselves, the possibility of giving plots to groups of women to farm cooperatively should be considered. This has been successfully implemented in the delta regions of Senegal. Women's access to dieri and walo lands also needs further investigation, especially as changing environmental conditions are transforming some of the land use systems in the region.

3. Any improvements in vegetable gardens, most of which are farmed by women, and in yields of traditional sauce crops would directly benefit both the diet and women's income-making potentials. Research and extension efforts should focus on these activities.

APPENDIX A

TOPICS OF INQUIRY FOR CONSUMPTION SURVEY

I. GENERAL INQUIRIES ORIENTED TO GROUPS OF WOMEN

A. MARKETS

1. Food prices
2. Location of Market
3. Periodic or permanent

B. FOOD PURCHASES

1. Items purchased daily - quantities
2. Items purchased less frequently

C. BARTER

1. Food exchanged
2. With whom
3. Frequency

D. FOOD SHARING

1. Who is sharing food
2. What is shared
3. How often is it shared

E. FOOD DONATIONS

1. Food Aid (government or non-government agencies)
2. What amounts
3. How often? (how many times in last 12 months)

F. GATHERED FOODS

1. What kinds, found where
2. How often
3. Availability
4. Preferences
5. Sale

G. STORAGE AND PRESERVATION

1. What is stored
2. Types of storage
3. How long ago were the stores depleted
4. Major cause of losses during storage

H. SEASONALITY OF CONSUMPTION

1. What foods are in short supply this season
2. Coping Strategies of the Household
   a. substitute foods
   b. selling gold, jewelry, boubou
   c. cutting down on meals - present number of meals consumed
   d. off-farm employment
   e. other sources of income to purchase food
   f. credit - borrowing food from merchants
      (local merchant or merchants in other towns or villages)
   g. borrowing from relatives or friends

3. Disease prevalence
   a. prevalence of different diseases (esp. diarrhea)
   b. infant mortality - deaths to births
   c. treatments

4. Water Source
   a. variation by season
   b. If well, changes in water level

I. TYPES OF FOOD PREFERRED

1. What is the preferred grain meat

2. What are the desirable qualities of the cereals Ease of preparation, texture, color, ingredients combined with

3. Why do they prefer some grains over others

4. What foods would they eat more of if they could afford it

J. FOOD PREPARATION

1. List of major dishes and their ingredients What eaten during each meal 24 Hour recall

2. Snacks

3. Preparation techniques
   a. when is the food prepared
   b. time spent gathering fuelwood water
   c. quantities of food consumed (local measures, per person)

4. Access to grinding mill Cost, How often If not, how much time does it take to pound the grain?

K. FOOD HABITS

1. Food taboos
   Religious, pregnant women, children

2. Weaning foods
   Foods for children of non-lactating women

3. Specialty foods
   Foods for women just after birth while breastfeeding

4. Breastfeeding
   Duration
   Practice of weaning - when and how?

5. Who cares for the children when women are working

L. WOMEN'S FARMING ACTIVITIES

1. Access to land
   Owned or borrowed
   Irrigated/ rainfed/ recession
   Environmental effects on access to land

2. Crops grown
   Grain, okra, vegetables, minor crops
   Have crops changed over time (e.g. still grow indigo, cotton,etc.)

3. Consumed/marketed

4. Problems
   Effects of male outmigration on women's farming activities

5. Desired interventions

6. Livestock ownership
   - what animals
   - products consumed/marketed
   - animals consumed/marketed

M. MARKET GARDENS

General Inquiries

1. How organized
2. Seasonality of crops grown
3. consumed/marketed - where marketed
4. source of water
5. constraints

II. INTERVIEWS CONDUCTED WITH INDIVIDUAL WOMEN

(Note: Try to interview widows and divorced women as well as married)

A. CHARACTERISTICS OF MEMBERS OF THE HOUSEHOLD

1. Age
2. Sex

B. OCCUPATION OF HOUSEHOLD MEMBERS

1. On farm
2. Off farm - seasonality
3. Migration patterns in and out of households

C. EDUCATIONAL LEVEL OF HEAD

D. ACCESS TO AGRICULTURAL LAND
For both males and females

E. COPING STRATEGIES OF THE HOUSEHOLD TO DEAL WITH FOOD SUPPLIES

1. Sources of income to purchase food
2. Off farm employment of women
3. Adjustment made in number of meals prepared
4. Selling of household items or personal items
5. Substitute foods
6. Credit - or relationships established with merchants
   Terms of credit
   Local merchants or in other towns or cities
7. Borrowing from relatives or friends

III. PERSONAL OBSERVATIONS

1. Cooking activities
2. Marketing activities
3. Water gathering activities
4. Fuelwood
5. Gathering wild foods

SUMMARY OF RESULTS OF THE CONSUMPTION SURVEY
SENEGAL RIVER BASIN

VILLAGES:	BOKI_DIAVE	DABIA_ODEDJI	AGNAM GO' I
	Pop: 2110, 1/2 Soninke, 1/2 Pulaar	Pop: 2671, Halpulaar	Pop: [illegible]4, Halpulaar
A. MARKETS			
Location		None, but a shelter with some goods or go to Boki Diave, 2.5 km.	Small market w/shelter.
Type of market (periodic, etc.)	Rice: 200/kg. Maize: 500/kg. Same, Souna, Fellah: 125/kg. Fish: big 150-200/fish. Meat: 650/kg. for beef. Sugar: 375/1 kg. Tea: small glass 200. Oil: 450/liter.	Rice: 200/kg. (after harvest only 250/moud). All other grains same price: 500/moud (fellah, same, souna, maize). Oil: 450/l. Sugar: 400/kg. Tea: 500/100g. Cowpeas: 500/kg. Pode: 400/moud. Meat: beef 5-600/kg. Goat and sheep:700/kg. Fresh fish: heap of 3-4-100; dry- 1)tambaje-200/kg. 2) kobo-250/kg. 3) gajebeur-1000/kg.(big).	Rice: 180/kg. Other grains: 125/kg. (now only sorghum). Cowpeas: 500/kg. Oil: 450/l. Sugar: 375/kg. Tea: 1/2 small teaglass 100. Fish: fresh-pile of 3 small-100, large basket-3-3500.Watermelon seeds:150/kg Peanuts: 400/kg. Dry fish: pile of 3=100; large-750/one. Salt: 125/kg. Red peppers: 10 small. Cube maggi: 20. Dry onions (1 ball): 15. Manioc: 25/tuber. Powder milk: 900 CFA per kg.
Food prices			
B. FOOD PURCHASES			
Items purchased daily	Meat, fish (dry & fresh), soured milk, sugar, tea, oil.	Rice, onions, tomatoes, pepper (red & black), maggi cubes, oil, vinegar, meal for mafe, potatoes, sweet potatoes. All available now.	Rice, sorghum, pepper, oil, maggi, fish, onions, canned tomatoes, pepper.
Articles purchased less frequently (2-3 days)	Cereals: 7000um for 100 kg. All imported.	Most food purchased daily.	Most food purchased daily. Some bulk purchases of grain.
C. BARTER			
Food exchanged	Rice for milk.	Cereals for oil, etc. Cereals for milk - lots of livestock.	Cereals for milk, lalo, even w/ boutiques. Milk/cereal-1:1. Lalo/cereal-1:1.
With whom	Peuhl-exchange rate 1:1.	Within village.	Peuhls bring in milk. Market women exchange others.
Frequency	Frequent but nothing else is exchanged.	Very frequent.	Very frequent - as long as grains in stock exchange for sauce ingredients.
D. FOOD SHARING			

	BOKI DIAVE	DABIA ODEDJI	AGNAM GOLI
Who		No. Everyone is in the same situation.	Friends or family.
What		Leftovers.	All food.
How often		Occasionally give leftovers to the needy.	Some have "regular" arrangements - lend to each other to tide over gaps in remittances.
E. FOOD DONATIONS			
Organizations		None.	None now - used to receive sorghum, maize.
Most recent		3 years ago.	3 years ago.
Frequency in last year		0	0
F. GATHERED FOODS			
Kinds and where found	Oulo, mourtodes, jaabe, jomba (small fruit ready in Jan.-Feb.) No other wild leaves.	Mourtode, jaabe, guidijile, dayril, tabe, oulo, quinqueliba, eeri, gawdi, lalo balli.	Mourtode, jaabe, pagiri, guidijile, oulo, quinqueliba.
How often	Greatly diminished w/drought. Mourtodes too far away to gather.	Mourtode and jaabe found 3 km. from village - collect often in season. Pagiri not many gather. Some buy. Hunger food. Oulo or lalo everyday. Quinqueliba frequent.	Frequent - some gathered, some purchased.
Availability by season	Oulo now before haco ready.	Prefer mourtode & jaabe. Baobob products are all imported-none here. Many gather just for consumption, others bring in for sale.	Mourtode & jaabe almost ready (don't make soup, just eat fruit). Pagiri now-diminished with drought.
Preferences		All wild foods are liked. Seemed quite important to this village. All come into village even if they don't gather themselves.	The fruits are valued. Lalo from baobob imported from Dakar area, eaten for couscous. Pagiri collected by young girls or if hungry.
Sale		Some mourtode, jaabe, pagiri, oulo, quinqueliba sold.	Peuhl bring guidijile in for sale. Oulo not around here. Women near the river bring to sell.
G. STORAGE AND PRESERVATION			
Products stored	Millet, sorghum, cowpeas.	Millet, sorghum, rice.	All cereals: millet, sorghum,

	BOKI_DIAVE	DABIA_GOEDJI	AGNAM GOLI
			cowpeas, watermelon seeds.
Types of storage		Sacks-do this if harvest is mall. Granary (sakh) has less nsect problem. Left on stalk no bancos here).	Put in square building or room. Stored on wood or shelves.
When stores depleted	All gone 2-6 mos. ago.	All are gone now. Most finished in June. In past, stores lasted up to 3 years.	Varies: 3-5 mos. ago. If have to exchange for other foods lasts only 1-5 months.
Causes of loss		Mice, termites, other insects. Big problem-no powders. Some have mouse traps.	Cowpea weavils, termites. Big problem. No powders. Just swap if find termites.
H. SEASONALITY OF CONSUMPTION			
1. Foods in short supply in	Fish both dried & fresh comes from coast everyday. Prices lower in dry season than now (eg. grains as little as 50-75 per kg.) or rice after harvest 250/moud for paddy while now 350. Hungry season: June-Dec. waiting for harvests.	Vegetables. Little seasonal variation. Can get potatoes and tomatoes even now.	Hungrier season June-Oct. when waiting for harvests. Now everything in short supply including vegetables, grains. Millet depleted-now only sorghum. Veg.: now only manioc, peppers.
2. Coping with shortages Substitute foods		Decreased milk consumption (used to drink 4 times/day). Especially lacking for children.	See meals.
Selling personal items		Yes - jewels, clothes, etc. If need money must find something to sell.	Yes - women have sold off a lot of jewels, pagnes, cloth.
Number of meals reduced		Just drink coffee for breakfast. If have big lunch skip dinner.	Skip meals. Often breakfast but also dinner (always eat at midday).
Off-farm work		Remittances.	Remittances important but less regular nowadays.
Other income for food purchase	Dyeing, making clothes, trading.	Dyeing, sewing, embroidery, market gardens, mats.	Women do small commerce, some embroidery (no longer dye-lack of materials).
Credit (borrowing food from merchants)	Yes, but not everyone. Some can borrow up to 1 sack, others nothing. No interest.	Yes, frequently. Pay back with remittances or harvest. Can pay back w/money or grain, merchant holds till price goes up. No interest.	If well-off get 5-10,000 for a month, if not 2,000. Pay back when remittances come or after harvest. No interest.

	BOKI_DIAYE	DABIA_ODEDJI	AGNAM_GOLI
What merchants	Local merchants.	Local (chief is a merchant who gives credit to many).	In the village.
Borrowing from friends/relatives			Yes, money and food.
3. Disease types	Malaria, measles, fevers.	Diarrhea, malaria, measles, jaundice, stomach and headaches, teeth & ear problems. A disease they haven't seen in 60 yrs. has reappeared in neighboring village. Cough a lot, lots of black bumps. No name given.	Coughs, diarrhea, measles, apolo, malaria.
Diarrhea prevalence	Winter have worse problems, some in summer.	Diarrhea at weaning but always a problem w/children.	At weaning and at change of seasons. Haco and gniri can cause diarrhea in children.
Treatment for diarrhea	Go to dispensary. Used to treat w/wild foods in old days and lots of kids died.	Go to medical center. Don't use baobab, etc.	Go to medical center in Sewul (3 km. away).
Other treatments	Go to infirmary.		Honey for coughs. Mourtodes for stomach aches. Jujubes for colds.
4. Water source		3 public wells (also private).	1 working well.
Seasonal variation		Always water but takes more time because use more.	Great drop in dry season - major constraint.
Changes in well level		None	
I. FOOD PREFERENCES			
Meat/Fish	Prefer beef over others-better supply.	All liked equally well.	Meat preferred-eat mostly fish.
Cereals	All liked - no marked preference.	All.	Prefer millet (esp. old people, young prefer rice). Same
next.			
Qualities desired in cereals			Taste.
Why some preferred over others			Souna preferred because goes well with dried fish (what they eat mostly). Same and fellah go better w/fresh fish/meat.
Food preferred if more money			Mafe w/meat, rice, vegetables, (Note: "Urban" foods not local cereals).

	BOKI_DAIVE	DABIA_ODEDJI	AGNAM_GOLI
J. FOOD PREPARATION			
Major dishes and ingredients		Mafe-rice is kept separate from sauce. Some w/okra, peanuts, tomatoes, etc. Ruiz=very finely ground grain w/sugar & milk. Liquid.	Rice w/condiments, couscous, gnirl, gossi.
Meals-what eaten and quantities (1 household) yesterday for: Breakfast	Sombi (rice, sorghum, millet, maize) w/sugar & milk, or leftovers from couscous of night before.	Coffee, sugar, powdered milk, bread.	Coffee, milk, sugar, bread if can afford, or quinqueliba if no coffee. If not, couscous w/meat or milk if can afford. Otherwise just with water & sugar.
Lunch	Rice w/fish, meat, etc. Couscous w/meat eaten infrequently.	Rice w/oil, tomatoes, fish or meat, red & black peppers, maggi, oil, vinegar. Potatoes and sweet potatoes.	Gniri (any cereal) or rice with meat or fish (dry or fresh).
Dinner	Couscous (maize, fellah, same, pagiri) w/meat or fish, haco also w/milk.	Couscous (any grain. Can buy already milled 250/kg. for all), w/haco, cowpeas, pode, peanuts, and either meat, dry fish or fresh fish.	Couscous (mostly same now), w/fish or meat, haco, peanuts, jalo, oil, etc. Gossi if less money available. Add milk or sugar if can afford (made of maize or rice).
Snacks		Candies, biscuits, baignet, milk.	
Preparation, techniques, when	Women take turns cooking if several in the house. Divide grain in two: hand pound morning, sift & use flour, take cracks to mill for evening.		Pound once in the morning. Takes 3 processes: 1)separate grain from stalk; 2)from chaff; 3)into cracked or flour.
Time spent getting fuelwood		Can still find wood around village not far. Some buy if no time.	Women, children & some men. Bring back a basin lasts 4-5 days, takes most of the day. If affordable, buy a cart load 1500 CFA.
Water		5 public wells and some private. Go twice a day, get 5-6 basins for big families. Women & young girls.	7 wells but only 1 works. In dry season long waits or get up early when recharged.
Amounts, local measures (per person)	Large family (5 married men, wives, kids): 8kg. rice for breakfast & dinner.		Eg. 2 adults, 6 kids, per day: 1.5 kg. rice, 2 kg. other grains.
4. Access to grinding mills	Here.	2 mills: public mill broken.	1 private mill.

	BOKI DIAVE	DABIA ODEDJI	AGNAM GOLJ
		Private also breaks sometimes.	
Cost	75 CFA/moud of cereals but maize 100.	Public: moud 60 CFA (if gas/oil expensive 65), maize 75. Private: moud 75, but maize 100.	125 CFA/moud for same, souna. 150 CFA for maize.
Frequency			If can afford once a day. Many women do by hand.
If by hand, time spent pounding	If no money, pound 1-2 hrs/day.	About 2 hrs. From 10-12 am.	At least 2 hrs., even if use mill must do first 2 steps manually.
K. FOOD HABITS			
1. Food taboos			
Pregnant women	Crocodile meat. Eat no special foods.	Rabbit meat: (bloody meat to cause bleeding at delivery. Crocodile meat: causes sexual problems in child. But not relevant now.	
Children	Eat everything-no taboos against eggs, tea.		None.
2. Weaning foods	Ruiz, eggs boiled in water.	Told at medical centers to give weaning foods. Milk, rice. Used to start at 2 yrs. w/adult foods.	Ruiz, milk, gossi (ground very fine).
3. Other foods for women who have just given birth	Soups w/chicken or w/meat and oil, bouillie. Return to work after 2 mos.	Used to just eat everyday food. Now some women took a course and told to eat meat, milk, finely ground foods. Gossi (rice). Also hot water w/goye (traditional fruit.) Aadi root of tree that restores energy. Meat (chicken), milk.	Meat if money. Otherwise gossi and drink hot water.
Foods for children of non-lactating mothers		Used to give a wet nurse. Also fresh milk. Now give ruiz fed with bottle.	Same as weaning foods.
Foods for sick		Same as weaning foods.	
L. Breastfeeding			
Duration		18 months.	18 months.
How weaned	Start supplementing 6 mos.	Bruskly but with supplementary	At 6 mos. give weaning foods or

	BOKI_DIAVE	DABIA_ODEDJI	AGNAM_GOLI
5. Care of children while women work		foods. Older children.	little bits of adult food.
L. WOMEN'S FARMING ACTIVITIES			
Access to land		Most women just help on husband's fields and care for smaller intercropped plants.	
Owned/borrowed		If widowed use husband's land (or if he is gone). If divorced, family land.	Husband, or from families.
Irrigated/rainfed/recession		Dieri, walo.	Dieri, walo. Most women don't have own fields. Only special circumstances but rare nowadays.
Changes with drought		Effects of outmigration.	Dieri fields very restricted. Some no longer plant. Women working more.
Crops grown - grains			Same as men. Dieri: souna, cowpeas, pode, foleri, kanje. Walo: same, cowpeas, maize.
Vegetables		Lettuce, cabbage, beets, carrots, onions, potatoes, tomatoes, hibiscus, kanje, peppers, manioc.	1984: cabbage, potatoes & others. Whatever seeds they have.
Minor		Walo: pode, kaye, foleri, cowpeas.	
Changes in crops grown	Used to grow more indigo-now purchase dyes.	Used to grow cotton & indigo-still card & spin cotton but brought in. Some wild indigo gathered.	Women growing grains w/absent men.
Consumed/marketed			Both.
Changes in women's farming with outmigration of males		Some women do the work, others hire labor w/remittances, others just buy food.	Widows, divorcees or men are gone must cultivate dieri & walo on their own w/help from children.
Desired interventions			Women's Group (Habi Musa Kunjo, President.) Started dyeing
but			lack of materials & time (men

	BOKI_DIAVE	DABIA_ODEDJI	AGNAM_GOLI
fields).			wanted them to work in Need help.
Livestock, ownership, which animals		Women own goats, sheep, cows.	Women own chickens,goats,sheep.
Products consumed/marketed		Milk consumed and sell surplus.	Used to have enough milk to consume and sell. Now consume all and still must buy milk.
Animals consumed/marketed		Sometimes sell sheep if need money, or if visitor, or for family occasionally.	Sometimes eat if no other meat, kill for a guest, sell if you need money.
M. MARKET GARDENS			
Organization	A large 10 ha. veg. garden under construction funded by emigrants. Putting up fence now, buying a pump.	Small garden enlarged this year. 150 women on the list but only room for about 30 parcels. All cooperative but each woman assigned own parcel. Grow one vegetable per parcel.	Started 1984 (112 people, made 200,000 CFA). Both cooperative and private parcels. No garden last year due to water problems and time.
Seasonality of crops grown		All did well except cabbage didn't form head. Plant in nursery and then transplant. Each woman tends her own plot. Now preparing plot. Before too much work in dieri & rice.	Planted around Nov. 1984. Not yet planted this year.
Consumed/marketed		All harvest sold. If member wants veg. she must buy. Certain women assigned to sell veg.	Coop produce sold while private mostly consumed.
How marketed		Sold here or in Boki Diave.	Here.
Source of water		Garden moved to be next to well. Water twice a day (4 basins in all per parcel.)	Well - hand drawn. Water lacking.
Constraints		Need a fence, water, seeds (buy in Thilogue).	
General observations Areas of research	Women hired for rice work 1,000 CFA for 8-2, same for men and women. Transplanting,winnowing women given 12 kg. rice or 1000 CFA/day. Given share of harvest if they help.	Put 3 basins of manure on each parcel. Given insecticides one year-grasshoppers a problem. Made 7,500 in 1984, spent 45,000 on fence but no garden 1985. This year moved next to	Women busy in walo during this season. Water drawing time consuming. Plan to plant this year but not yet started.

SUMMARY OF CONSUMPTION SURVEY

	TYIKKITE	DAKA_OUROULBE	BODE_LAO	GAMADJI
A. MARKETS				
Location	No permanent market. Only 1 saleswoman works out of her house. Women buy food at Boumba.	No market, buy food every 2-3 days at Gollere.	At center of village-daily between 8-13:30	At center of village under a tree.
Type of market			Permanent.	Permanent, between 9-13 hrs. daily.
Food prices			Dry fish: 200 CFA/kg. 2 for 50 CFA. Cowpeas: 50 CFA/small tea glass. Canned tomatoes: 25 CFA/ coffeespoon. Oil: 500 CFA/l. Sorghum: 175 CFA/andan. Paddy rice: 125/andan. Soap: 175/500 g. Matches: 25/box. Bread: 100/400 g. Dry pepper: 10/pile. Follere: 5/pile. Cake: 5/piece.	Okra: 25/pile. Cube maggi: 25/pile of 3. Dry Fish: 3 small for 25 CFA; 2 big for 50 CFA. Maize: 500/mould. Melon seeds: 50/pot. Sorghum: 125/kg. Cowpeas: 150/pot. Fresh maize: 100/pile of 4. Oil: 425/l. Rice: 175/kg. Sugar: 375/box.
B. FOOD PURCHASES				
Items purchased daily	Oil, cereals, condiments, maggi cube, onions, fresh or dry fish.	None.	Oil, millet or sorghum, onion, dry or fresh fish, cube maggi.	At this season: millet or sorghum, condiments, cube maggi, onion, dry or fresh fish, milk.
Articles purchased less frequently (2 or 3 days)	Rice, bread.	Oil, millet, sorghum, rice when needed, fresh or dry fish, tomatoes.	Rice, if can afford.	Rice, oil.
C. BARTER				
Food exchanged	Millet, sorghum for sour milk (at harvest).	Sour milk for millet and sorghum.	Millet or sorghum for sour milk. Millet & sorghum sold to buy condiments.	Cereals for sour milk.
With whom	Peuhl women.	The inhabitants of Gollere.	Market sellers. Peuhl women.	Peuhls.
Frequency		Every 2-3 days.	Every day until stocks	Every day until stocks are

	TYIKKITE	DAKA_OUROULDE	BODE_LAO	GAMADJI
			are depleted.	depleted.
D. FOOD SHARING				
Who	Relatives, friends.	Neighbors.	Relatives and friends.	Relatives and friends.
What	Cereals.	Cereals.	Cereals.	Cereals.
How often	Variable.	Variable.	When needed.	Rare because everyone is poor.
E. FOOD DONATIONS				
Organization	Government, CIMAD, and PPNS (for children under 5 yrs.)	PPNS	PPNS (at Mare Lao).	Government (even when it came it reached few people.)
Quantities	Powdered milk, oil, sankal.	Oil: 1/4-1 l/child. Flour: 4 kgs/child. Powdered milk: 1.5 kgs.	Flour: 7-8 kg. Powdered milk: 4 kg. Oil: 1 l. Sankal: 8 kg. Cerelac: 8 kg/child.	
Most recent	State-CIMAD-nothing for 2 years.	Nothing from govt. in 2 years.	PPNS delivers monthly. Govt. nothing for more than 1 year.	Five years since received grains. 2 years since corned beef.
Frequency in last year	PPNS once a month.			
F. GATHERED FOODS				
Kinds & where found	Mourtode, Jaabe, Paguiri, Niandane, Dadji (when swamps present).	Mourtode, Jaabe, Niandane.	Mourtode, Jaabe, Niandane, Paguiri.	Paguiri, Guidjile, Mourtode, Jaabe, Tuperre.
How often			When available.	When available.
Availability by season		Cool dry season.		
Sale	Sell mourtode & jaabe, also consume.		Sell & consume mourtode & jaabe.	Sell and consume mourtode and jaabe.
G. STORAGE AND PRESERVATION				
Products stored	Grains: sorghum and millet.	Grains: sorghum and millet.	Grains: millet, sorghum and paddy rice.	Grains.
Types of storage	Stored as seed. Treat with HCH when available.	Stored in Gollere in granaries loaned by friends.	Rice in bags. Millet and sorghum: sacks or stalk. Treat with HCH when available.	In bags in granary or banco.
How long stores lasted	2-3-4 months.	6-12 months when cereals are available	3-5 months.	Rice: 1 month. Millet-sorghum: 2 months. Eat and

	TIIKKITE	DAKA_OUROULBE	BODE_LAO	GAMADJI
		in the market. Sell 2-3 sheep and buy enough grain for several months.		sell to purchase condiments.
Causes of loss	Insects, mice.		Insects, rodents.	Insects, rodents.
H. SEASONALITY OF CONSUMPTION				
1. Foods in short supply in this season	Cereals, vegetables.	Cereals.	Cereals, vegetables.	Cereals, vegetables.
2. Coping with shortages				
Substitute foods	Reduce the quality of meals. For example, gossi.	Exchange cereals for milk.		Gather wild foods.
Selling personal items	Yes.		Clothing, jewelry.	Yes.
Number of meals reduced	2 or 1.		Reduce number and quality of meals.	Reduce number of meals: 2 or 1 a day.
Off-farm work			Emigration from time to time.	
Other income for food purchase	Sell small livestock.	Sell livestock.	Sell livestock.	
Credit (borrowing food from merchants)	Yes, but limited to less than 2500 CFA.		Credit limited to one month or until the village harvest.	Limited-loan only to the rich.
What merchants	Village.			Village.
Borrowing from friends/ relations	Yes, if they can lend. Can go eat at neighbors on occasion.		Yes, if they can.	Yes, if they can.
3. Disease				
Types	Diarrhea (especially when the milk from food aid arrives).			Diarrhea, malaria.
Diarrhea prevalence	Malaria during rainy season.	Diarrhea present all year long.		Frequent with the floods.
Treatment for diarrhea	Go to dispensary at Boumka.	Dispensary. Bark of guinjile (but children dislike because bitter.		Dispensary at N'Dioum or sellers of medicines (fraudulent).

	TIIKKITE	DAKA_OUROULBE	BODE_LAO	GAMADJI
Other treatments	Dispensary but few medicines.			
H. Water				
Source	Marigot for household and washing, well for drink (lack equipment for drawing water).	Ponds in rainy season. River the other seasons.	4 wells in village: 1 doesn't work, 2 have water but level lowers very quickly, 1 hydraulic well not yet working. Lack water drawing equipment; no pulleys, bags & ropes rare.	Well, marigot (comes & goes)
Seasonal variation				
Changes in well level				
I. FOOD PREFERENCES				
Meat/fish	Sheep.	Sheep.	All meats eaten.	Sheep.
Cereals	Millet, sorghum.	Millet, sorghum.	Eat what one has.	White same.
Qualities desired in creals	Give both flour & cracked grain so more economical.	Taste.	Economical.	Same is more economical (flour & cracked grain). Can make several dishes.
Why some preferred over others		Accustomed to eating sorghum & millet.		Taste.
Food preferred if more money	Rice with fish or with meat at mid-day, couscous at night.	Gniri with meat or rice with mutton for lunch. Couscous & meat for evening.	Rice with fish or meat at lunch. Couscous and meat in the evening.	Couscous, gniri with white same, rice occasionally.
J. FOOD PREPARATION				
Major dishes and ingredients	Gniri: Millet or sorghum with fresh or dry fish, oil. Couscous with haco & melon seeds with cowpeas or just with water if lack ingredients.	Gniri: Millet or sorghum. Dry or fresh fish. Maggi, tomatoes, butter from cow or goat milk. Lakh: millet or sorghum (flour made into balls) and sour milk.	Gniri Bouna (w/fish). Gniri Kwasam (w/sour milk)-same as Lakh.	Gniri, rice with fish, couscous with haco, mourtode, cowpea or melon seeds. Eat meat only at Tabaski, baptism and if old animal dies.
Meals				
What eaten and quantities (1 household) yesterday for:				
Breakfast	Coffee & leftovers from dinner. Couscous	Coffee with goat's milk & couscous. Tea	Leftovers from previous night. Couscous	Coffee, tea or quinquelibe & leftover couscous from night

	TIIKKITE	DAKA_OUROULBE	BODE_LAO	GAMADJI
	and haco or with milk or water. Gossi with sugar & milk or just milk.	at 10 a.m.	with milk or haco. Coffee or tea. Bread from time to time.	before.
Lunch	Gniri with fish. Rice with fish if can afford.	Gniri, Lakh, rice with fish (once a week) or when there is a visitor.	Gniri bouna, gniri kwasam, rice with dry or fresh fish.	Gniri, rice & fish. If no grains, eat haco with mourtode and melon seeds.
Dinner	Couscous with haco or with sour milk or with just salt water.	Couscous & milk, couscous & meat.	Couscous & haco or with dry fish or with milk.	Couscous with haco & beref or cowpeas or with salt water if nothing else available.
Snacks	Mourtode, Jaabe.	Mourtode, Jaabe.	Mourtode, Jaabe.	Mourtode, Jaabe.
Time spent getting fuelwood	Gather wood in dieri. Go for 4 hrs. every 2 days. In dry season gather cow dung near village.	Less than 1 hour. Place to gather wood is close.	8-12 am every 2 days.	9-12 am every 2 days.
Water	Marigot is 2 km away.	Ponds close by but river is distant (1-5 hrs.)	Morning.	2 hrs. to the marigot.
H. Acess to Grinding Mills				
Where	Mill given by CIMAD; broken for 8 months.	Mill at Gollere.	Private mill.	Mill given by Mimouna Kahn (former Minister of Social Development).
Cost	75 CFA/moud.	30 CFA/andar.	70 CFA/moud.	50-70 CFA/moud.
Frequency	Rare.	Every 2-3 days.	Rare.	Broken for 5 months. Operated for 3 years.
If by hand, time spent pounding	2 hours.		More commonly hand-pound, 3 hrs./moud.	
K. FOOD HABITS				
1. Food taboos				
Religious	Pork.	Pork.	Pork.	Pork.
Pregnant women	Eat everything.	Eat everything.		Eat everything.
Children	Eat everything.		Eat everything.	Eat everything.
2. Weaning foods	Sour milk.		Regular food & sour	Adult food, bouillie & sour

	TIKKITE	DAKA_OUROULBE	BODE_LAO	GAMADJI
			milk.	milk.
3. Other foods for women who have just given birth	Bouillie for 2 wks.	Bouillie, meat soup kill animal for this occasion.	Bouillie, gossi, soup if can afford.	Coffee, bouillie, haco, gossi, guidjile.
Foods for children of non-lactating mothers	Sour milk, bouillie.	Goat's milk and sugar.	Sour milk.	Sour milk, bouillie.
Foods for sick	Bouillie.	Bouillie.	Bouillie.	Bouillie.
4. Breastfeeding				
Duration	18 mos.	24 mos.	18 mos.	18-24 mos.
How weaned	Take child to Marabout.	Just stop one morning, put cow dung on breast.	Go to Marabout. Put cow dung on breast.	Marabout.
5. Care of children while women work	Older sister or carry on back.		Older sister, grand-parents or carry on back.	Older sister, grandparents or carry on back.
I. WOMEN'S FARMING ACTIVITIES				
Access to land		No fields for women. Men only have dieri fields.		
Owned/borrowed	Inherit lands from father or husband. Also borrow.		Inherit land from husband or relatives.	Inherit, cooperative member.
Irrigated/rainfed/recession			Irrigated: women can belong to the group. Walo: inherited.	Irrigated: as cooperative member. Walo: inherited.
Changes with drought	Walo land rarely flooded.		Little walo land flooded.	Great reduction in flooded areas.
Crops grown				
Grain	Millet, sorghum, maize.		Millet, sorghum, maize, rice.	Cereals (millet, sorghum, maize, rice.)
Vegetables	Cowpeas, melons, sweet potatoes, follere.		Cowpeas, melons, sweet potatoes, follere.	Cowpeas, melons, sweet potatoes, follere.
Consumed/marketed	Cereals both eaten/sold.		Both eaten & sold.	Sell grains & vegetables.
Problems	Small size of irrigated parcels. Rapid deple-	Small size of irrigated parcels.	Small size of irrigated parcels. Rapid deple-	Rapid depletion of stores. Small size of irrigated

	TIKKITE	DAKA OUROULBE	BODE LAO	GAMADJI
	tion of stocks.		tion of stored grains (for food & purchase of condiments).	parcel.
Changes in women's farming with outmigration of males	Women responsible for parcels.		Women responsible for men's work as well as their usual tasks.	Assuming all responsibility.
Desired interventions	TOOLS FOR EASING THE BURDEN OF WOMEN'S WORK, EG. MILLS.			
Livestock Ownership				
Which animals	Few animals left. Most gone for sale or due to drought. Some fowl, goats, sheep.	Sheep, goats, fowl.	Fowl, sheep, goats, but few.	Fowl, sheep, goats, but very few.
Products consumed/marketed	Milk.	Milk.		Milk.
Animals consumed/marketed	Sell animals when necessary. Tabaski.	Animals sold when necessary.	Animals sold when necessary.	Sell animals.
H. MARKET GARDENS				
Organization	Have a president and treasurer, 300 members each with own plot. Begun 3 yrs. ago.	Women belong to PPNS garden at Gollere.	Garden supervised by CIMAD. Men belong as well. They made the fence & the plots. 5 groups of women for watering. Begun 1985.	Started 8 yrs. ago under SAED then CIMAD. Garden divided into 6 sections. Each section tended by a group.
Seasonality of crops grown				Cool season.
Consumed/marketed	Each woman chooses whether to sell or not.		Each group gives part of produce for the fund, the other portion is eaten.	Both consumed & sold.
How marketed	Sell in M'Boumba.		In village.	Sell at N'Dioum & in village.
Source of water	River: water by hand.		Marigot.	River.
Constraints	Water, wood for fence.		Water, equipment.	

SUMMARY OF RESULTS OF THE CONSUMPTION SURVEY
SENEGAL RIVER BASIN

VILLAGES:	NGOUI	MERI
	Pop: 652, Mostly Halpulaar, some Peuhl, Maure. Mostly fishermen (Chubalo).	
A. MARKETS		
Location	None. 2 boutiques (Pete market 3 km.)	20-30 women under small shelter, 5 boutiques.
Type of market (periodic, etc.) Food prices	Rice: 200/kg (100 for paddy). Same: 100/kg. Fellah (no souna available). Cowpeas: 200/kg. Oil: 500/l. Peanuts: 100/kg. Pode: 150/kg. Maize: 100/kg. Sugar: 400/kg. Tea: 6000/kg. Fish fresh: 5-6: 100-200; dried-5:100. Buy in Pete: souna: 15,000/100 kg. Maize: 15,000/100 kg.	Rice: 200 (after harvest paddy rice=300/moud) Same, fellah=450/moud. Ground maize: 200/kg. Cowpeas: 1000/moud. Watermelon: 400/moud. Oil: 500/l. Sugar: 400/kg. Tea: 4000/kg.
B. FOOD PURCHASES		
Items purchased daily	Rice, oil, maggi, pepper, laurel, tomatoes, onion, some buy cereals daily.	
Articles purchased less frequently (2-3 days)	Some cereals.	
C. BARTER		
Food exchanged	Fish for milk, cereals for oil, rice, etc.	Wild fruits for cereals. Most goods handled by market women are tradeable (eg. fish, grains, milk, foleri, peppers, etc.)
With whom	Milk w/Peuhls of village. Other with boutiques.	
Frequency	Very frequent: many use grain stocks to barter for all other foods.	
D. FOOD SHARING		
Who	Relatives and friends.	No. "If you have you eat with your family, if you don't have you starve with your family"
What	Harvest. If good, share, but when stock is low, cannot help others.	
How often	Not so frequent, everyone is poor.	
E. FOOD DONATIONS		

	NGOUI	MERI
Organization	Vivre de Soldure from government but last 19 mos. ago. PPNS brings food to village. Five years ago cooked as group.	None
Quantities	Each child: 4 kg. cereal, 1 liter of oil, 2 packets milk powder. Each mother takes her allotment. All children 3 mos.-5 yrs.	
Most recent	Last month.	4 years ago.
Frequency in last year	Not quite every month.	
F. GATHERED FOODS		
Kinds and where found	Mourtode, jaabe, paguiri, guidjile (has brought in-no trees here), oulo, quinqueliba (brought in from dieri by nomads), dayrii, tabbe. Bokki (only 2 in village, belong to one man).	Mourtode (here), jaabe (dieri), pagiri, to be guidjile (dieri), oulo, tupere, saputa, tireo (green leaves), quinqueliba (dieri).
How often	Mourtode and jaabe gathered morning and night now. Pagiri gathered now. Oulo earlier in rainy season-now eat haco. Dayrii and tabbe gathered earlier during rains.	Frequent.
Availability by season	Fruits now actively exploited. Leaves used earlier in rainy season.	Mourtode, jaabe, guidijile all ready now.
Preferences	Pagiri-poorer families gather as much as 1 sack, but people like the taste, despite difficult pounding. Like them all.	Like all fruits. Pagiri viewed as hunger food (only few kg. gathered at a time.)
Sale	Fruits exchanged by village women. Quinqueliba, bokki brought in by Peuhls.	Mostly exchange for cereals. Buy baobob products.
G. STORAGE AND PRESERVATIC		
Products stored	All cereals grown, some dried leaves.	Cereals.
Types of storage	Put in "sak" or bancos mainly on stalks.	Bancos - mud walled granaries. Stored on stalks.
When stores depleted	Depends on family-some six mos. ago. Most are now buying all grains.	Some lasted only 1 mo. Fellah-1 mo., others much longer. Rice-all purchased now.
Causes of loss	Mice, termites, weavils. To combat weavils in cowpeas put in jar, mix with ashes or sand and seal. Powders-some from Saed but not much.	Mice, termites. Only way to combat rodents is "beat with a stick."

	NGOUI	MERI
H. SEASONALITY OF CONSUMPTION		
1. Foods in short supply in this season	All cereals in short supply (millet, same, fellah). No vegetables. Note: Demand for fish goes down now that there is more milk during rainy season.	Souna very rare. Rarely get peanuts. Other cereals including rice are difficult to get. Vegetables. Note from fish seller: demand for fish decreases in wet season because people drinking more milk.
2. Coping with shortages - substitute foods	See meals.	
Selling personal items	Women have sold anything that can be sold.	Yes.
Number of meals reduced	Some may eat only once a day at midday or some twice a day.	Always eat at midday-may skip other meals.
Off-farm work	Women sell the fish (own money for food, clothing, etc.)	Remittances less dependable.
Other income for food purchase	Make mats, market women, make pagne.	Market garden.
Credit (borrowing food from merchants)	Available-but great variation. Some get 25 CFA, others up to 1 sack of grain.	Only some people in whom merchants have "confidence". Not much (10-20 kg). Poor can't get any.
What merchants	Here and in neighboring towns.	Only in village.
Borrowing from friends/relatives	Yes.	Nobody can borrow because no one has anything to lend.
3. Disease types	Malaria, schistosomiasis, colds, stomach, muscle aches.	Malaria, fatigue.
Diarrhea prevalence	Lots of problems. More now than in the dry season.	Very common.
Treatment for diarrhea	Lalo pounded and drunk. Kodipile-bouili of same made with butter.	Have infirmary. Told to make rehydration fluid (ORT).
Other treatments	Mainly go to infirmary in Pete or village 7 km. away. Some "leaves" to reduce fevers.	Mourtode good for stomach problems. None for malaria except modern medicines.
4. Water source	Marigots.	3 wells but only 2 working. Some use marigots.
Seasonal variation	Available all year.	Problems in dry season.
Changes in well level		Don't know.
I. FOOD PREFERENCES		

	NGOUI	MERJ
Meat/fish	Like the variety both meat & fish although fresh fish much preferred	Like meat - eaten very rarely (all varieties). No butcher here. Eat a lot of fish.
Cereals	All liked.	Souna.
Qualities desired in cereals	Like variety in preparation & cereals.	Taste, habit. Doesn't need other ingredients. Preparation time.
Why some preferred over others	Even though maize difficult to pound, still eat a lot as couscous, gniri, and bouilli.	Souna preferred because of tradition and because does not require fish, less costly, takes less time to prepare.
Food preferred if more money		Still prefer souna. Rice is recent.
J. FOOD PREPARATION		
Major dishes and ingredients	Couscous (maize, souna, rice, same, fellah, nyidigo), gniri buna-dry fish lidi (fresh fish),kwassam (milk);yaninongo-pounded cereal and cowpea boiled w/salt; sauces-fish, cowpeas, milk, oil, tomatoes, onions, if can afford. Lalo in couscous.	Couscous (maize, same, fellah), rice, gniri.
Meals-what eaten and quantities (1 household) yesterday for: Breakfast	8-10 a.m. Leftover couscous from night before w/haco or fresh milk if available or just with sugar and water if no money. Some coffee and bread.	Coffee and bread. Couscous w/haco from night before.
Lunch	2-4 p.m. Gniri (w/dry or fresh fish or milk). Rice as bouilli or as mafe domada or with peanuts.	Gniri (same, fellah, maize) w/dry or fresh fish. Rice w/oil, fish, foleri, maggi cubes, tomatoes. If no fish eat w/cowpeas.
Dinner		Couscous w/haco or w/watermelon w/fresh or dry fish if available.
Snacks		Wild fruits, sweets.
Preparation, techniques, when	Pound once in the morning.	Women in 1 household take turns cooking.
Time spent getting fuelwood	Mostly women. About twice a week-near the village. Some buy-one pile 25 CFA.	Gathered daily by women in dieri. Some buy cart load=1500 CFA; 4 pieces=25 CFA.
Amounts, local measures (per person)	For family of 2 adults, 3 kids, prepare 4 kg. of cereal a day.	Family of 5 adults, 7 kids; 4 kg. rice, 4 kg. other cereal per day.
4. Access to grinding mills, where	None. Some go to Pete'.	7 public, private, also rice husker from SIMAD
Cost	115/moud for all including maize.	500/moud same price for public & private.
Frequency	Occasional.	Most women use mills.

	NGOUI	MERI
If by hand, time spent pounding	Maize takes about 4 hrs. others less.	Once a day - several hours.
K. FOOD HABITS		
1. Food taboos/religious		Moslem taboos.
Pregnant women	Used to not eat couscous at all only gossi or boulli. Thought harmed child. Now doctor tells them to eat everything but salt.	None-now told not to eat salt. Crocodile in olden days.
Children	Before eggs and fish.	None.
2. Weaning foods	Given adult foods. Before milk and rice bouilli.	Bouilli made of souna, milk, lots of adult foods.
3. Other foods for women who have just given birth	Gossi, bouilli, quinqueliba. If husband can afford, get meat or chicken soup.	Milk, gniri w/milk. Husband kills a sheep if he can.
Foods for children of non-lactating mothers	Milk.	
4. Breastfeeding duration	Some 14 mos. Others as late as 36 mos.	24 months (some earlier, 18 mos.)
How weaned	At about 8 mos. some supplement. Others wait until weaned.	At 6 mos. start supplements.
L. WOMEN'S FARMING ACTIVITIES		
Access to land	Mostly help on husband's fields (drop seeds, transplant, harvest).	
Owned/borrowed	Most cultivate husband's field. Some widows have inherited own walo. Divorcees farm family's lands. Also sharecrop.	
Irrigated/rainfed/recession	Walo. Dieri.	Dieri-mostly husband's land. Some women have own irrigated parcels. Walo-work on husband's land unless single.
Changes with drought	No women do ag. wage work. Less land to cultivate.	Some women who used to farm have moved into trading.
Crops grown - grains	Dieri: cowpeas and melons.	Souna, pode, some rice, same, fellah, maize, (but not all women).
Vegetables	Walo-potatoes (sweet), tomatoes, folleri, cowpeas, okra, melons (jayigi, chaole,	Tomatoes, onions, peppers, carrots, beets.

	NGOUI	MERI
Consumed/Marketed		Rice only for consumption. Others depend on harvest.
Desired interventions	Want a market garden (for women), mill. Note: Women have small seedbeds near their houses (about 10sq.m). Propogate sweet potato cuttings, start tomatoes, and folere to transplant to walo. Planted in small raised beds watered and shaded.	
Livestock, ownership, which animals	Some women have 2-3 goats or sheep. Some chickens.	Mostly sold to buy food.
Products consumed/marketed	Part of milk sold, part consumed.	
Animals consumed/marketed	Animals sold when severe need of money.	
M. MARKET GARDENS		
Organization	Youth coop started 1985 (162 members). initiative. Spent 9000 CFA on seeds in Podor and Dakar. Planted Nov., applied manure.	2 gardens: one youth, other adults (men & women). Each person own parcel-no collective. Purchased seeds, manure applied.
Seasonality of crops grown	All dry season: eggplant, onions, carrots, peppers, lettuce, cabbage, bitter tomatoes, tomatoes, squash, potatoes.	All dry season.
Consumed/marketed	Sold all here (35,000 CFA) but poor harvest (did not meet demand).	Varies by individual.
How marketed	Sold in village even to coop members.	
Source of water	Marigot (500 m). Women carry water, men water. Women work in groups of 17, men 13.	Watered by hand from well, 2 times a day.
Constraints	Lack of water. Worms in cabbage and tomatoes. Rats, termites, winds.	Water, insects.
General Observations Areas of research	Active youth coop - trying to get a health care project from UNICEF started. Have sent 2 to Pete for some training. Garden-no access to insecticides. Bought some watering cans.	

SUMMARY OF RESULTS OF THE CONSUMPTION SURVEY
SENEGAL RIVER BASIN

VILLAGES:	DIERI DIOUGA	DIERI DIOBE	MAFRE DEKOLE
		Pop.: 3360, Halpulaar	Pop.: 400 people. Peuhl (Not a real interview.)
A. MARKETS			
Location	Small market in a shed. No boutiques left (had 5 before drought).	No market. Toulgegali (300 m. away) has one.	Go to Podor (339 km. away) to buy milk.
Type of market (period, etc.) Food prices	Available: Fish: dry-2 small 100; fresh-2 small 150. Tomatoes-350 CFA/moud. Peanuts-400 CFA/kg. Kanje, peppers (black & red). Rice-paddy=250/moud; clean=180/kg. Same-100/kg. Maize-350/moud (not in village). Cowpea-150 CFA for small teaglass. Oil-500 CFA/liter (women buy it at 475 CFA in Hare Lao for resale). Tea-175-200 CFA for teaglass. Sugar-425/kg. (Buy powdered milk in 3 qualities: 1) 850/kg; 2) 600/kg; 3) 475/kg.: poor quality.)	Peanuts - 400/kg. Meat - beef 750 kg.; goats - 800 kg. Rice-200 kg. Paddy-300/moud. Same-500/moud. Maize is rare now so costs 600/moud. Oil-500/liter. Pode: moud in dry season=500 CFA, now 300 CFA/moud. Cowpea-teaglass 50. Sugar-450/kg. Tea-200/small glass. Salt-375-500/7 kg. Milk powder-5-1000/kg. Fish-2 big 200 fresh; dry-200-500 CFA/kg.	Butter: 1liter = 2000 CFA. Calabash of milk - 25 CFA. Works out to about 125/l. In past years when milk supply is low 200 CFA for calabash (about 5 calabash to the liter).
B. FOOD PURCHASES			
Items purchased daily	Varies by available money.	Fish, tea, oil rice.	Dry fish purchased along paved road or in Podor. No fresh fish.
Articles purchase less frequently (2 or 3 days)	Some can afford to buy sacks of grain, dried fish, oil in quantity (but none knew price so must be rare).	After harvest buy sacks: 15000/100 kg. same; 7500-8000/50 kg. on the highway. Rice-1750/100 kg. Now just in boutiques in small quantity.	
C. BARTER			
Food exchanged	Milk for cereals (1:1). Some wild foods but very little.	Cereal or rice for milk, salt, lalo, quinqueliba, butter.	Exchange their milk for rice, oil, cereal, tomatoes. Exchange rate: 2 milk for 1 cereal (sometimes 1:1).
With whom	Nomads bring in milk.	With women in the village. None with merchants-only cash. Peuhls bring in wild foods/milk.	Villagers.

	DIERI DIOUGA	DIERI DIOBE	MAFRE DEKOLE
Frequency	Less in recent years.	Frequent.	Once a week.
D. FOOD SHARING			
Who	Neighbors.	If a neighbor has nothing, share with them.	
What	Meals.	Give them ingredients and they cook in their own house.	
How often	If you have no food in the house your neighbor may ask you to share his meals.	Sometimes.	
E. FOOD DONATIONS			
Organization	None. No PPNS. Built a building to house infirmary but destroyed by rain.	Government PPNS-very little. Most mothers don't participate.	
Quantities	N/A	Last year 2-3 sacks per carre.	
Most recent	Not since 1985.	1985.	
Frequency in last year	-0-	-0-	
F. GATHERED FOODS			
Kinds and where found	Murtoki - eat leaves as well. Regeo - leaves. (Note:these leaves cannot be dried. Must be eaten fresh). Jaabe.	Lalo comes in from dieri (far away). Naoco (like quinqueliba). Guidijile. Baobob fruit. Mourtode (fruit & leaves). Jaabe. Paguiri-rare now. Oulo. Tupere (tribulis eat leaves when young.) Regeo.	
How often	No oulo here. Must go very far for products-can take whole day (12 km.)	Frequent.	
Availability by season	Mourtode & jaabe in Nov-Dec but most are dead.	Guidijile, mourtode, jaabe now ready. Leaves earlier in rainy season.	
Preferences	Haven't seen paguiri in 10 yrs. and miss it.	Used to eat a lot of paguiri but less available now-eat it if very hungry. Like the fruit best.	
Sale	Some but not much.	Not sold.	

	DIERI DIOUGA	DIERI DIOBE	MAFRE DEKOLE
G. STORAGE AND PRESERVATION			
Products stored	Rice, sorghum, cowpeas.	Rice, same, cowpeas.	
Types of storage	Used to build sak and banco but since less to store don't bother - some can process all at once and store in sacks.	Used to make sak or faura (mud granary) but now put in-inside banco. On stalk, process as needed.	
When stores depleted	Nothing left now. Only seeds for walo planting. Many depleted same around July. Rice only 1 1/2-2 1/2 mouds left. Quantities small to begin with, shared.	Rice-must sell 1/2 or more to buy other ingredients so didn't even last 1 month. Same also only 1 mo. Cowpeas-buying for seeds.	
Causes of loss	Termites, rats. Some keep cats, some build wooden platforms, others buy powders.	Termites, rodents. Only way to combat is cats. Powders not available.	
H. SEASONALITY OF CONSUMPTION			
1. Foods in short supply in this season	No fellah available, nor souna. Cowpea-cannot afford to eat, only buying seed. Lots of foods regularly unavailable in this village (must go to larger centers). Only paddy rice in village now. Not much variation in price by season, harvest is shared.	Milk only in rainy season. Vegetables. Cereals, pode, rice, oil - can find but expensive.	Milk all year even if powdered.
2. Coping with shortages Substitute foods	Supposed to eat 3 times a day. Now some only eat twice a day. Some families don't eat at all on alternate days.	Eat couscous plain.	
Selling personal items	Yes, but most items already sold.		
Number of meals reduced	Used to eat 3 times a day. Now many only eat 1-2 meals a day if poor.	May skip lunch anyway since working out in the fields. Also may skip due to lack of food.	
Off-farm work	Small trading.		Many immigrants (Dakar, Mali, Gambia, Switzerland).
Other income for food purchase	Husband supposed to supply food and money. If no husband, women farm on own and sell part of the harvest.	Women work as laborers on rice parcels (transplant, harvest, thresh) given 8-12 kg. of rice per day.	Women make calabash covers & mats but don't sell much.

	DIERI DIOUGA	DIERI DIOBE	MAFRE DEKOLE
Credit (borrowing food from merchants)	Can get small amounts (1-2 mouds) for 1-2 days.	None, they are too poor to qualify.	
What merchants	Only here - never other villages.		
Borrowing from friends/ relatives	Very rare.		
3. Disease types	Malaria (every family has at least one sick), measles, diarrhea, apollo.	Malaria, diarrhea, apollo, colds.	
Diarrhea prevalence	All year long.	Lots of diarrhea problems especially at weaning. Many children die at this age. Diarrhea all year long.	
Treatment for diarrhea	Drink salt water. Drink [illegible] of jaabe. No special foods.	Go to infirmary.	
Other treatments		Naoco-good medicine for coughs. Malaria-used to bleed forehead. Appolo-bleed next to eyes.	
4. Water source	2 wells-one for market garden but used for domestic as well.	2 wells-1 started by government but finished by immigrants. Other dug by village collective.	
Season variation	Never dries up totally.	Sometimes nothing in dry season. Go to river 1.5 km. away.	
Changes in well level	Wells very deep.	Wells very deep but not much water in them.	
I. FOOD PREFERENCES			
Meat/Fish	Prefer all meats (beef, goats, sheep) over fish but eat rarely. Men preferred fish, women preferred meat.	Prefer meat-not because in short supply. Fish too messy, lots of garbage, needs a lot of soap, bones.	Meat, but fish since to eat meat requires killing an animal.
Cereals	Same, fellah.	All (same, souna, rice).	Souna.
Qualities desired in cereals	Habit - women know how to fix different dishes.		
Why some preferred over others	Used to prefer millet but has been in such short supply in recent years so changed preference to sorghum. All cereals same amount of work but with	Same and rice are easier to prepare but that is less important than supply.	Like the taste of souna and has good associations with abundance. Prefer same over rice-know sorghum better and know how to work it.

	DIERI DIOUGA	DIERI DIOBE	MAFRE DEKOLE
	sorghum get larger quantity.		
Food preferred if more money	Meat (including chicken). Meat eaten only for ceremonies, visitors or if animal dies.		Milk-if not enough fresh milk buy powdered milk.
J. FOOD PREPARATION			
Major dishes and ingredients	Couscous, gniri, rice. New dishes since drought:seafish, packaged milk, rice dishes like mafe, yassa. Dishes no longer eaten include lots of butter and river fish.	Couscous (purchase rice or same). No fellah or nyidigo here. Mafe domada. Cossi (made of maize). Ruiz. Laru-gniri mixed w/foleri, fish, salt. Used to eat more milk, butter (didn't use peanut oil). Eat fish 2-3 times a day.	Couscous or gniri w/milk-these are the preferred. Now eat rice and nboderi. Before ate butter eg. Gniri meri w/fish or meat or cowpeas.
Meals-what eaten and quantities (1 household) yesterday for: breakfast	Couscous w/milk (some made w/ rice since other cereals in short supply-souna, same,fellah) Some eat coffee, biscuits & bread from Hare Lao.	Coffee or tea w/bread. Some eat couscous leftovers either w/haco or if have animals with milk.	Couscous and milk.
Lunch	Gniri buna (w/dry fish, used to eat w/lots of butter). Gniri w/milk. Rice w/fish (used to be river fish). Gniri w/melon or w/cowpeas. Gniri eaten more than rice because takes less ingredients than rice.	Gniri w/kwassam, dried fish, beref, fresh fish. Rice w/oil and fish (dry & fresh). No vegetables.	Gniri or rice w/oil, maggi, fish.
Dinner	Couscous w/haco, some just plain couscous. Sauces w/haco, beref or dried fish.	Couscous w/milk, haco, dry fish (no cowpeas, no peanuts). Meat eaten very rarely (maybe twice a month) for guests. If mix baobab w/water and add a little sour milk almost like milk. Stretches small milk supply.	Couscous w/milk.
Snacks	Wild fruits.	Can't afford.	
Time spent getting fuelwood	Wood 1.5 km. away. Everybody collects (men, women, children). Wood never sold.	Not too time consuming. Everyone involved, go 1.5 km. away.	
Water	Well is very deep (35 m)-need cords, hard work.	No problem in rainy season, but walk in dry season 2 times/day, 3 trips each time.	

	DIERI DIOUGA	DIERI DIOBE	MAFRE DEKOLE
Amounts local measures (per person)	Family of widow w/2 adult women and 4 small children eat 2-3 kg. a day.		
4. Access to grinding mills Where	None here. Closest is in Hare Lao about 13 km. away. Go rarely-only if there for other reasons.	None here, in Dodil 8-9 km.	
Cost		Don't seem to know.	
Frequency	Some pound 3 times a day. Rice needs 2 poundings (clean) while other cereals processed all the way to flour.	Transport costs 200 CFA alone.	
If by hand, time spent pounding	2-3 hrs/day. All females contribute.	Lots of different poundings required even for one meal-cereal rice, watermelon, lalo. If visitor comes start over so very time consuming.	
K. FOOD HABITS			
1. Food taboos, religious	Differs by caste.		
Pregnant women	Depends on caste-each group has own.	Only avoid what makes them sick. Doctor says to avoid salt.	
Children	Used to have belief about eggs-no longer. Other beliefs-eg. children should not touch cat or teeth not come in.	None.	
2. Weaning foods	Adult foods.	Milk and adult foods. Some gossi, ruiz.	
3. Other foods for women who have just given birth		Gossi, karow (pounded cereals made into balls), ruiz, meat if can afford.	
Foods for children of non-lactating mothers		Milk.	
Foods for sick		Nothing special.	
4. Breastfeeding duration	12-24 months when pregnant or when child loses interest may be earlier.	18 months whether walking or not.	
How weaned	Start supplementing about 6 mos.	Very abrupt-done in one day, but	

	DIERI DIOUGA	DIERI DIOBE	MAFRE DEKOLE
		supplement when can sit up (6 mos.)	
5. Care of children while women work		Other children.	
L. WOMEN'S FARMING ACTIVITIES			
Owned/borrowed	Husband's unless unmarried.	Some widows have inherited husband's parcels but walo considered man's land.	
Irrigated/rainfed/recession	Dieri, Falo and Walo. No women have own irrigated parcels. Help w/transplanting, threshing and do all the winnowing. No women do wage work here but Maure women do in neighboring village.	Some women sharing on rice parcels (can do all the tasks.) Women grow sweet potatoes in falo-all their own.	
Changes with drought	Fewer cereals produced.		
Crops grown - grains		If on own, grow same crops as men. Cowpeas, pode, foleri are woman's responsibility.	
Vegetables	Women care for the cowpeas, watermelon in dieri and sweet potatoes in falo.	Beets, lettuce (note: didn't know know how to eat. Tried cooking w/oil & fish. Then gave to animals), cabbage, onions.	
Minor		Sweet potatoes.	
Changes in crops grown	None.	No more cotton or indigo.	
Consumed/marketed		For cowpeas, pode and foleri must get husband's permission to sell.	
Changes in women's farming with outmigration of males	Some women do all the farmwork themselves, but others under another man.		
Desired interventions	Desire to learn how to read (French & Pulaar). Would like vegetable garden. Need cords for drawing water. Want dispensary (closest is Njoum). Want a mill.	1) Mills; 2) water; 3) other villages better developed than they.	Note: Dry meat sometimes by cutting it in strips & winding around stick. Never dry milk.
Livestock, ownership,	No animals left, all have died.		Lots-3 inheritors; wife, son, daughter. Men inherit twice as

	DIERI DIOUGA	DIERI DIOBE	MAFRE DEKOLE
			many, but debts must be settled first.
Products consumed/marketed	Women do the milking.		Each woman takes her own milk in once a week to Podor to sell (at least 30 l). Women do the milking.
Animals consumed/marketed			Order of animals sold: goats, sheep, beef.
M. MARKET GARDENS			
Organization	Two gardens begun in 1984 by SIMAD (dug a well & gave some watering cans). Older people's garden abandoned. Interfered with walo work. The young people's garden operated as a collective. Hope to use proceeds for village projects like mosque. Use manure.	Started last year but destroyed by insects. SIMAD gave them some seeds (they bought others), gave them watering cans, pails, rakes. Started as collective (eg. made fence, seeded) but then broke up into individual parcels. Each person responsible for watering own parcels twice a day.	OFADEC built the garden, 6 ha. Have tractor, 48 parcels, 25 x 40 each. Every farmer has own (some women but mainly men).
Seasonality of crops grown	All planted around November-seeds bought in Njoum. Onions did well, also mint. Many "European" did poorly: Cabbage, eggplants, beets, carrots.	Got no cabbage. Onions just the leaves. Not whole range of seeds (eg. no carrots, potatoes, beets).	Grow watermelon, cowpeas and other melons in current season. Cool dry season vegetables like onions, cabbage,tomotaoes,etcc
Consumed/marketed	All sold within village. Small revenues used to buy seeds.	Very poor yields. One man got only 1 kg. from his plot.	Tomatoes sold to canning factory. Onions sold in Dakar.
How marketed	Sold by members of collective.	Not enough to market.	
Source of water	Well dug by SIMAD.	Well.	Bore hole w/pump-CARITAS (230 m. deep-18 million franc).
Constraints	Insects (worms in cabbage), fence broken. Tomatoes a variety that doesn't do well here.	Ravaged by insects-borers in cabbage.	Planted late in Dec. so winds troublesome. Problems w/ storage and transport.
General observations Areas of research		Will abandon garden this year.	Problem w/labor-herders left w/herds and parcels went uncultivated.

APPENDIX C

GATHERED FOODS AND MEDICINES

Pulaar	Soninke	Hassanyia	Scientific Name	Use
murtode (murtoki-is the tree)	sexene (sekhene)	tongue or tougue	Balanites Aegyptiaca	Yellow fruit at end of rains, soap made from nut; medicinal
jaabe	fa	sidraye	Zixphus Mauritania	Small orange fruit; medicinal
bokki	kiide (kide)	--------	Adansonia digitata	Fruits-pain de singe-medicine bard=cord leaves=-laalo mushrooms-Kidie xaxe
paguirri	jaaje (diadie)	az	Brachiaria hagerupii	Small grass seed
guidgile	mandaxe (mandakhe)	---------	Boscia Senegal-ensis	Fruit, medicinal
dayrrii or tabbe	bude or tabbe (boude or tabbe)	---------	Nymphaea lotus	Seed from flower plus root eaten (water-lily), medicinal
caapato (Tjapato)	--------	--------		Same plant as above except with red grains, called "Maure" in Pulaar

APPENDIX C

GATHERED FOODS AND MEDICINES

Pulaar	Soninke	Hassanyia	Scientific Name	Use
oulo	kasa (kasse)	--------	Cassia tora	Leaf eaten as leaf sauce
kenkeliba ("kinkili") (quinque-liba-Fr.)	xande	--------	Cambretum micranthum	Leaves of tree used for tea
eri (eede is fruit)	denmbu	--------	Sclenocarya birrea	Acid fruit, hardwood for pestles, etc.
gawdi (tree) gawde (fruit)	jabe yitte jabe renme	--------	Acacia scorpoides (nilotica)	Paste from fruit used in tanning leather
caski	kune	avrerayye	Acacia albida	Pods for fodder; tanin from bark
dacche (gum)	kanbare (cambare)	--------	Acacia Senegal	Medicine, wild food, gum
pattuki (tree)	xiile			
jabbe (fr. tammarinier)	xaralle	--------	Tamarindus Indica	Fruit and drink, herb/spice, seed edible
takiette terabbe	--------	--------	--------	Grass made into laalo (common in the guidima-ka)

APPENDIX C

GATHERED FOODS AND MEDICINES

Pulaar	Soninke	Hassanyia	Scientific Name	Use
gumgume (goumgumme)	gungunme (goumgoume)	--------	--------	Type of mint used in tea and to cure medical problems (mental - jom hoore) and other illnesses
kelli (keeli)	sanbe (Sambe)	Thijij	Grewia bicolor	Herding sticks, perhaps other uses?
tuupere	dagare	--------	Tribulus terrestius	Saure leaf
lalo bacli	taxaye	--------	Corchorus tridens	Grass, dried + used in sauce
ngaado	--------	--------	Dicadi longifolium	"Wild onion, morpho-logically resembles an onion (used to kill rodents poisonous to certain animals
(koylonye)	xollinne	--------	--------	Nut, herders specialty
sorbadde	luxulaaxa	--------	--------	Root in sandy soil (very watery) wood for chewing sticks

APPENDIX C

GATHERED FOODS AND MEDICINES

Pulaar	Soninke	Hassanyia	Scientific Name	Use
Regeo	--------	--------	--------	Tree with small leaves, cut leaves and use twigs for chewing stick
Lalo	--------	--------	Corchorus olitorius	Medicinal, sauce
taxaye	--------	--------	--------	--------
alluki	Jabe	--------	acacia radiana	--------
takiette terabbe	--------	--------	--------	Grass leaf dried and ground into powder/used like baobab leaves in couscous (therefore a kind of laalo)
gellooge (fr. Palmier doum)	--------	--------	Hyphaena theabaica	--------
koppi geloodi (knees of the camel")	--------	--------	Trianthema portul-acastrum	Leaves for sauce
safato	--------	--------	--------	Weed used for sauce
--------	--------	--------	Digitata exilis	Eaten? Perhaps as a leaf sauce?

APPENDIX C

GATHERED FOODS AND MEDICINES

Pulaar	Soninke	Hassanyia	Scientific Name	Use
ndagedji	--------	--------	--------	Wild potato, eaten like potato
lawnande	katabaane	--------	Combretum aculeatum	?
capotoye Alla	--------	--------	Leptadenia pyrotechnica	Massage; other uses?
nofel mbaalu	--------	--------	--------	?
--------	dere	--------	--------	Like spinach
--------	Jomba	--------	--------	Fruit
--------	toureme	--------	--------	Fruit
keboy- diji	--------	--------	--------	?
sumaani nimsa	--------	--------	Portulca oleracea	Sometimes confused with koppi geloodi; used to make soap, the plant is dried in the sun, burned, ashes put in a cloth and set over the cooking pot in a couscous steamer while hot

APPENDIX C

GATHERED FOODS AND MEDICINES

Pulaar	Soninke	Hassanyia	Scientific Name	Use
sumaani nimsa	--------	--------	Portulca oleracea	water is poured over it, pottasium rich water is boiled down a bit and animal fat stirred into it, then it's formed into balls while soft and still hot and set out to harden
bulbi	gesexulle	--------	Acacia seyal	Bark is medicinal
gawdi	jabe	--------	Acacia scorpoides (nilotica)	Fruit medicinal
geloki	xaame	--------	Guiera senegalensis	Leaves as cough medicine
aljanawi (or aljanaw	nemimaaso	--------	Cassia occodentalis	Medicinal herb, used on sore muscles and open sores
nammaade (or nammaari)	gasanbe	--------	Bauhinia rufescens	1-cure stuffed nose, boil leaves and drink. 2-diarrhea medicine, pound leaves and drink
cekirijeri	--------	--------	--------	Boil bark of tree, eases labor pains

APPENDIX C

GATHERED FOODS AND MEDICINES

Pulaar	Soninke	Hassanyia	Scientific Name	Use
--------	daraase (Drasse)	--------	--------	Put leaves in fire and cover head and breath for cold
--------	Ketebene*, Ketemene** (Ketebene)	--------	--------	Put leaves in fire and cover head and breath for colds
wiiro (cotton)	kottone, kottolle	--------	--------	Fruit mixed with milk as diarrhea treatment

*Name given according to the region
*Guidimaka followed by **Gorgol pronunciation.

APPENDIX D

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