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PL 480 Food Aid Needs Assessment for Niger

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Preface

In recent years, the United States has been providing Niger with PL 480 emergency food aid. Levels of assistance have varied from 96,000 metric tons of commodities during the Sahelian drought to 10,000 metric tons in 1978 and no food aid assistance from 1979 to 1981. (Table B-1, Annex B, presents complete data.) Niger remains extremely vulnerable to food shortages and requires large volumes of imports when the rains fail.

As an alternative to emergency food aid, USAID/Niger proposed a multiyear Food for Development program (FFD) in its FY 84 Annual Budget Submission. FFD programs regularize the planning and delivery of food aid and use proceeds from the sale of food aid to fund projects that improve food supply, and distribution, and address the causes of need for food aid. The USAID/Niger proposal for a three million dollar Title III program was incorporated into AID's FY 1984 Congressional Presentation and submitted to Congress in January 1983.

In the meantime, personnel within the Africa Bureau (AFR) and the Bureau of Food for Peace and Voluntary Assistance (FVA) in AID/Washington asked USAID/Niger to investigate the possibility of a Food for Development program under Title II, Section 206. The Mission's FY 1985 CDSS, submitted in February 1983, proposed a four-year Title II, Section 206 program valued at \$13.1 million for food commodities and \$15.6 million for commodities and delivery combined. In view of the different proposals pending, Washington agencies reached informal consensus that the design of a food aid program for Niger should address the feasibility of both Title II, Section 206 and Title III.

In late February 1983, the Government of Niger concluded the most successful grain purchasing campaign in the twelve-year history of its grain marketing board, OPVN. OPVN purchased 86,000 metric tons of millet and sorghum, exceeding its own target of 70,000 metric tons. These grain purchases raised the question of whether food aid was needed at all in Niger.

To seek answers to this question, a Food Aid Needs Assessment was conducted in 1983. This report presents the findings of the Food Aid Assessment Team. Its purposes are: 1) to assess whether Niger continues to need food aid; 2) to determine whether a Food for Development Program under PL 480 can have a measurable impact in reducing the need; and 3) to recommend an appropriate size and commodity mix for a FFD Program, and appropriate PLW design requirements.

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The entire Team acknowledges the sustained support and substantive contribution of Mission Director, Irving Rosenthal.

Executive Summary

The natural resource base for Nigerien agriculture is fragile. In recent years, recurring droughts have necessitated appeals by the Government for emergency food aid. Niger received about 193,885 metric tons of emergency food aid (mostly sorghum) from the U.S. alone during the ten year period 1973-82 (a yearly average of 19,389 metric tons).

USAID/Niger has proposed a Food for Development program (FFD) to replace emergency food aid shipments. Food for Development programs regularize delivery over a multiyear period and use proceeds from the sale of food commodities to fund projects that improve food supply, distribution, and address the causes of need for food aid.

The purpose of this report is threefold: 1) to assess whether Niger continues to need food aid; 2) to determine whether a Food for Development program under PL 480 can have a measurable impact in reducing the need; and 3) to recommend an appropriate title of PL 480, an appropriate size and commodity mix for a FFD program and appropriate PID design requirements.

To assess whether Niger continues to need food aid, the Food Aid Needs Assessment Team (Team) examined supply and demand data for major crops, the grain marketing and distribution system and patterns of food consumption.

For millet and sorghum, Niger's traditional food staples, data on yields, area planted, production and consumption diverge widely, depending on the source. Government of Niger (GON) figures are generally believed to overstate both production and consumption levels. Taking into account climatic and environmental factors and data from local studies of crop yields, the Team revised production downward.

Thus, the Team's estimates are 75 percent of the Government's estimates for millet and 95 percent for sorghum. The Team also revised the GON's figures for combined grain consumption levels: for agro-pastoralists, consumption levels were reduced from 250 to 205 kilograms per person per year; for pastoralists and urbanists, consumption levels were reduced from 200 to 175 kilograms per person per year.

The Team examined Niger's grain marketing and distribution system. OPVN, the GON's marketing board, is charged with managing grain reserves and stabilizing fluctuations in price and supply. Niger had only an average millet and sorghum harvest for the 1982/83 crop year. Yet, OPVN managed to exceed the 70,000 metric ton target for this official grain purchasing campaign by buying 86,600 metric tons. Several reasons account for this record purchase level: 1) OPVN purchased only from producer cooperatives, ending its previous practice of also buying from traditional chiefs; 2) the price offered by OPVN often exceeded the open market price; 3) OPVN was able to pay cash on the spot for all grain offered, thanks to a sizeable loan from the central bank (BCEAO); and 4) OPVN was authorized to purchase grain from Nigeria.

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Counting these grain purchases plus OPVN reserves and late food aid arrivals, Niger was still holding more grain as of mid-June 1983 (174,000 MT) than it had capacity to store under roof. Market consumer prices dropped considerably below the official OPVN consumer price. Concerned that OPVN may not be able to sell its grain fast enough to generate funds to repay the central bank loan, the GON appealed to donors twice for financial support for OPVN's operations and temporary storage facilities.

This Assessment contends that Niger's food marketing and distribution system procured much more grain in 1982/83 than was necessary. The cereals market in Niger remains in a glut. During FY 1984 and possibly FY 1985, Niger will not need any more grain imports, including PL 480 food aid grain. However, the phenomenon of huge grain surpluses could easily reverse itself within one or two years and Niger could find itself once again with a severe grain deficit.

Since aggregate estimates of grain sufficiency do not reveal fluctuations in actual grain consumption throughout the year, the Team examined patterns of food consumption among different population groups. Depending on the season, the percentage caloric contribution of grains to the diet is estimated to range from 5-90 percent for pastoralists and 60-80 percent for agro-pastoralists. During two separate hardship seasons (three to four months each year) pastoralists and agro-pastoralists have high work and energy demands when food availability is low. Weight loss occurs for all members of the family. During this time, grains contribute approximately 80 to 90 percent of all

calories, resulting in a diet that is unbalanced and low in quality, palatability and digestibility.

To supplement diets during the hardship seasons, pastoralists and agro-pastoralists need fat-containing foods such as milk, groundnuts and oil. Higher fat foods enhance palatability and the absorption of nutrients. Also, fat-containing foods provide more calories than grain; one gram of oil contains nine calories while one gram of millet contains four calories.

For Niger, the Team recommends the following nutritional goals:

1) Assuring a yearly per person grain availability of 205 kg for agro-pastoralists and 175 kg for pastoralists and urbanites evenly distributed throughout the year;

2) Assuring greater access of smallholder rural groups to non-grain calories in the form of higher fat foods during their respective hardship seasons. At least 15 percent of total dietary calories should come from products such as milk and groundnuts and 10 percent of total calories should come from oil.

Currently, Niger is not meeting either of these goals, even though it appears to be meeting its aggregate food requirements. Since most rural diets are seasonally deficient in calories from fats and oils, the Food Aid Needs Assessment Team examined supply and demand for vegetable oil. Two principal sources supply peanut oil in Niger, industrial refineries and local or artisanal processing. Artisanal processing accounts for over 90 percent of Niger's peanut oil supply and appears profitable only

when the peanut cake is also sold. Peanut oil production has declined during the past decade as peanut production has declined. Aggregate per capita consumption in 1982/83 was approximately 4.9 liters.

Consumers in Niger prefer peanut oil as the traditional edible oil and will pay a premium for it, but they also appreciate the option of paying less for vegetable oil for everyday use. Demand data for vegetable oil are not firm, given a poor statistical base. The supply of vegetable oil exceeded 25,000 metric tons in 1982/83, of which nearly 90 percent represented unrecorded imports from Nigeria. Little is processed domestically and food aid vegetable oil contributes only a marginal volume.

The Team believes that imports of PL 480 vegetable oil will not pose a substantial disincentive to domestic peanut production and peanut oil processing. As long as the GON continues to encourage recovery of the peanut sector, peanut production should strengthen, not weaken. An increase in the supply of vegetable oil should not cause a substantial change in taste preference or shift in consumption habits in view of the strong traditional preference for peanut oil.

The financial viability of a PL 480 vegetable oil program warrants close and continuing review. Vegetable oil prices in the US have risen sharply as a result of droughts and the Payment-In-kind (PIK) program. The dollar remains strong against the CFA franc, making PL 480 vegetable oil all the more expensive for Niger. To meet the requirements of a PL 480 FFD program, GON authorities may have to slightly increase the official retail price of vegetable oil.

The Food Aid Needs Assessment Team makes the following recommendations.

- o The Team recommends that USAID initiate a multiyear Food for Development Program for Niger, based on 4,000 metric tons of PL 480 vegetable oil, a volume representing approximately 20 percent of Niger's consumption. (Further, the Team recommends that the FFD program be structured flexibly to allow the import of up to 4,000 metric tons of PL 480 sorghum annually, if needed.)
- o The Team recommends that the FFD program be implemented under terms of Title II, Section 206. Such a program would be consistent with the objectives of the approved USAID development strategy for Niger (CDSS) and form an integral part of the USAID portfolio.
- o The Team recommends a series of food sector/grain marketing policy reforms for phased implementation over the life of the Food for Development program. These reforms entail 1) improving the management and cost-effectiveness of OPVN operations; 2) modifying certain pricing policies; 3) determining the optimum level of OPVN market activities required to stabilize grain supplies and prices; 4) redefining OPVN's mandate, where appropriate; and 5) granting OPVN greater operational autonomy within the framework of its revised mandate.

To be effective, these reforms will require divestiture by UPVN of inappropriate interventionist roles in grain marketing and continued removal of obstacles to market-oriented operations. These reforms would have far-reaching consequences for Niger's food security and should be attempted only within the context of a long-term policy dialogue.

- o The Team recommends that the projects selected for funding through the sale of PL 480 commodities relate as closely as possible to the proposed policy reforms above and to activities which ensure steady growth of, and improved seasonal access to oil, whole milk, groundnuts or other oil seeds.

Examples of projects that USAID/Niger might consider are: small or large ruminant production for smallholders pastoralists who do not already own livestock, dry season forage production on fallow fields, improved medium-scale oil-seed processing, cooperative marketing of dairy and oil seed products.

- o The Team recommends that the budget of the FFD program be structured so that all activities will be fully financed from proceeds from the sale of PL 480 vegetable oil, but with flexibility to expand and/or accelerate the scope of activities if additional funds are available from the sale of PL 480 sorghum.

- o The Team recommends that OPVN be responsible for receiving and storing the PL 480 vegetable oil for distribution and marketing through normal commercial channels. OPVN should submit revenues from sales to a financial institution in Niamey for deposit into a PL 480 Food for Development account. The Ministry of Rural Development should be responsible for overall FFD program management and implementation.
- o The Team recommends that USAID/Niger designate a direct-hire staff member as FFD Program Coordinator and supporting staff as necessary to assume responsibilities for monitoring, coordinating and evaluating the FFD Program.
- o The Team recommends that the GON deposit into the PL 480 Account the full "landed" value of the food aid, commodities plus delivery costs, and that the consumer sales price in Niger incorporate OPVN's domestic handling and commercial distribution charges. In this manner, the FFD program will benefit from a fuller budget, OPVN will not incur any financial losses on the food aid transaction, and the consumer price will not pass along any indirect subsidies which could cause a disincentive to domestic production and marketing of oils.

At the conclusion of this report, the Team presents specific terms of reference for the design of a Food for Development program identification document (PID) under Title II, Section 206.

## I. Assessment of Need for PL 480 Grain Program

### A. Major Crops: Production and Import Trends

Only about 24 percent of the land in Niger is suitable for agriculture and livestock. This agro-pastoral belt, lying along the southern frontier, has a semi-arid climate. Annual rainfall varies between 350 mm and 900 mm. The sandy soils are classified as "moderately poor." Production levels are closely correlated to the volume and spacing of rainfall.

Agriculture accounts for more than 50 percent of the output from the rural sector and 25 percent of GDP. Since the Sahelian drought in the early seventies, favorable weather and conscious efforts by the Government of Niger (GON) have resulted in steady increases in food crop production. But population shifts and marketing bottlenecks have caused food grain deficits in some urban pastoral areas.

The sections below present data for major crops: millet and sorghum, rice, corn, wheat, peanuts, cowpeas and cotton. (Other other crops grown in Niger include fonio, manioc, potatoes, sweet potatoes, onions, tomatoes, okra, red peppers, sesame, sugarcane, and tobacco.)

#### 1. Millet and Sorghum

Millet and sorghum are traditional staples in Niger. Millet has low water and soil fertility requirements and is grown in every department of

the country. According to Government figures, the Niamey Department accounted for the greatest quantities of millet produced in 1982/83 (318,633 MT), followed by Zinder (284,322 MT), Maradi (268,238 MT), Dosso (253,695 MT), Tahoua (150,643 MT), Diffa, and Agadez. Official production estimates were around 1,295,400 tons in 1982/83. Production levels have remained relatively stable during the past five years.

Sorghum grows best on more fertile soils with better moisture retention and is produced primarily in Tahoua, Maradi and Zinder Departments. Consumers prefer white and yellow sorghum varieties. (Red sorghum is higher in tannic acid and harder to digest.)

Annual production levels cannot be given precisely. Figures for millet and sorghum are often combined and disaggregation may not be feasible. Data from different sources are inconsistent, varying in terms of yields, area planted, production and consumption. Analysts generally consider government production and consumption figures to be too high but there is also broad disagreement among alternative figures cited.

GON production estimates are made by the Agricultural Statistics Office in the Ministry of Rural Development (MDR). MDR has an established system for estimating production of millet and sorghum. MDR contends that its sampling method is statistically sound and renders accurate results. The official GON production estimates for the past five years are shown in Table I.

Table I. GON Production Estimates for Millet and Sorghum, 1978-83

	<u>1978/79</u>	<u>1979/80</u>	<u>1980/81</u>	<u>1981/82</u>	<u>1982/83</u>
<u>Millet</u>					
Area: ha	2,746,800	2,922,085	3,072,420	3,259,406	3,065,680
Yield: kg/ha	409	430	444	415	414.5
Production: tons	1,123,400	1,256,500	1,364,200	1,323,780	1,295,400
<u>Sorghum</u>					
Area: ha	795,900	716,660	768,070	788,308	1,130,817
Yield: kg/ha	460	489	479	408	406
Production: tons	370,890	350,450	367,910	321,630	459,112
<u>Total production</u>	1,494,290	1,606,950	1,732,110	1,635,410	1,660,965

Sources: Production figures through 1980/81 are taken from le Rapport Annuel, Tome II: Statistiques Annuel 1980 (Republique du Niger, Ministère du Développement Rural, Direction de l'Agriculture). Production figures for 1981/82 and 1982/83 are taken from l'Evaluation de la Production 1982 (Direction de l'Agriculture).

based on a recent investigation of Nigerien crop yields and production,<sup>1</sup> this Food Aid Needs Assessment believes that production is overestimated, giving a picture of grain availability that is too optimistic.<sup>2</sup> Yields for millet and sorghum are shown consistently

<sup>1</sup>Cullen, Michael A. and Walstein, A. "Grain Markets in Niger," (Small Farmer Marketing Access Project (SFMA); AID, Washington), June 1983.

<sup>2</sup>In view of the primacy of food security as a Government objective, there may be a political imperative to inflate crop estimates in order to demonstrate that efforts to boost agricultural production and development are succeeding.

nigher than those in other Sahelian countries where rainfall is often more abundant and lands more fertile. Errors may result from unsystematic sampling of yields and areas cultivated, taking samples at the wrong time of season, or neglecting to include fields which were sown once but then abandoned as the rains failed.

Also, government figures appear to underestimate the area of land cultivated. Land pressures are pushing farmers further north onto more fragile, marginally productive land. By failing to include these marginal lands, yield data are artificially inflated.

No alternative national surveys exist for comparison to Government figures. A number of small scale, village level studies report yields for one or two growing seasons. Extrapolating to a national basis from these diverse studies would be unacceptable. Each study had a different methodology, testing different elements in a localized farming system. For this and other reasons, confidence in representativeness could not be assumed.

Given the usual climatic conditions, often inadequate and poorly distributed rainfall, and the spread of agriculture onto marginally productive land, the Food Aid Needs Assessment Team (Team) revised production estimates downward. In the absence of alternative estimates of hectares under cultivation, the Team retained the GON's area figures and simply multiplied yield figures by a factor of 0.75 for millet and 0.95 for sorghum. Revised yield and production estimates are shown in Table II.

Table II. Team Estimates of Millet and Sorghum Production in Niger

	<u>1978/79</u>	<u>1979/80</u>	<u>1980/81</u>	<u>1981/82</u>	<u>1982/83</u>
<u>Millet</u>					
Area: ha	2,746,800	2,922,085	3,072,420	3,037,600	3,065,680
Yield: kg/ha	307	323	333	311	311
Production: tons	843,268	960,443	1,023,116	1,013,675	953,426
<u>Sorghum</u>					
Area: ha	795,900	716,660	768,070	788,308	1,130,817
Yield: kg/ha	443	465	455	388	386
Production: tons	352,346	332,928	349,515	305,549	435,156
<u>Total produc- tion</u>	1,195,614	1,299,371	1,372,631	1,319,224	1,389,582

During the past year, OPVN purchased millet and sorghum imports from Nigeria. Approximately 12,800 metric tons were imported officially and an approximately equal amount (about 13,000 MT), were imported unofficially. Niger has received only 5,000 metric tons of millet as food aid during the past five years. OPVN has maintained steady imports of sorghum on commercial terms. In the 1982/83 campaign, it authorized the purchase of nearly 26,000 metric tons of sorghum from Nigeria. It is believed there was a nearly equal volume of unrecorded sorghum imports. Niger has received an average of 5,688 tons of food aid sorghum during the past five years, most of it American. The U.S. delivered 15,000 metric tons of PL 480 sorghum for emergency purposes in FY 1982.

## 2. Rice

Rice is a favored staple in Niger's large towns and cities. Rice consumption has grown rapidly during the past five years, nearly doubling to reach about 100,000 metric tons annually.

Rice cultivation is limited to irrigated perimeters along the Niger River in the Department of Niamey (Kolo and Tillabery) and Dosso (Gaya). According to Government estimates, Niger produced 30,757 metric tons of rice (paddy) in 1980/81. Slightly more than half the crop was harvested on 6,550 hectares of Government-managed land (controlled-flooding hydro-agricultural project zones); yields exceeded 4,000 kg/ha.

The remaining crop was grown on approximately 18,000 hectares of traditional paddies where yields are 1000 to 1300 kg/ha. The GON plans to bring an additional 1,000 hectares into paddy production annually and is evaluating the feasibility of a major dam at Kandaji. This dam would have the potential of irrigating 140,000 hectares. The GON estimated paddy production at 38,345 metric tons in 1981/82 and 51,530 metric tons in 1982/83 (or a milled rice equivalent of 24,924 metric tons and 33,495 metric tons, respectively).

Domestic rice is generally sold in paddy form and then hulled by the consumer. There are, however, two rice mills in Niger — located in Tillabery (4,000 MT capacity) and in Korkissoye (6,000 MT capacity), a suburb of Niamey — capable of turning out whole rice, broken rice and rice bran. Both mills are operating far below capacity.

Commercial sources of imported rice are principally Thailand and Pakistan but also China, Burma and Japan. A major agreement for rice commercial imports from Pakistan was announced in March 1983, although no details as to price, volume or other terms have been released. Official imports of relatively inexpensive Asian broken rice have averaged close to 30,000 metric tons per year. In 1983, the GON cut back the volume of authorized rice imports to 15,000 metric tons. Unrecorded imports are estimated to exceed 30,000 metric tons annually, mostly trans-shipped through Nigeria by numerous merchants handling small quantities at a time. Niger has received an average of 2,077 metric tons of food aid rice from various donors annually.

### 3. Corn

Official production figures for corn were estimated at 9,968 tons for 1980/81. Production was distributed among the various Departments as follows: Tanoua (3,070 MT), Maradi (1,780 MT), Diffa (1,575 MT), Dosso (1,390 MT), Niamey (1,350 MT), and Agadez (315 MT). Production is estimated to have increased 5 percent annually for 1981/82 and 1982/83.

Corn yields have fluctuated over the past decade. According to GON estimates corn yields reached as high as 780 kg/ha when rainfall was adequate, as in 1979/80. The following year, yields declined to 657 kg/ha. GON estimated the total area under cultivation to be 12,172 hectares in 1979/80 and 15,173 hectares in 1980/81.

All of Niger's corn crop is marketed or consumed on a local basis. No domestic corn has been marketed through OPVN channels. However, OPVN has marketed food aid corn received from France, the EEC, the WFP, and Saudi Arabia. Sacks of American corn are also regularly sighted in markets along the Nigerian border, re-exported unofficially from Nigeria.

#### 4. Wheat

Wheat is grown predominantly in the irrigated oases of the Air Mountains and on the banks of Niger's scattered lakes and ponds (e.g., Maçarounfa, Gyidimouni, Keita). Wheat is primarily used for baking bread and snacks resembling doughnuts.

Estimates for wheat production and area under cultivation are sketchy. GON figures report 480 hectares under cultivation for wheat in 1979/80, with yields averaging 2,030 kg/ha and production totalling 980 tons. No official production or yield data are available for later years.

Food aid wheat originates primarily from Germany, Canada, France, and Saudi Arabia. Like all food aid, it is marketed through OPVN channels. Milling is generally a small scale, local operation using gasoline powered mills.

COPRO-Niger, a state controlled enterprise, was granted the official concession from OPVN for commercial wheat imports in 1979/80. Shortly thereafter, COPRO curtailed commercial wheat imports in favor of flour, claiming reasons of cost efficiencies due to Niger's insufficient industrial capacity to mill imported wheat. COPRO's official wheat imports for 1981/82 totalled 23,627 metric tons. Another estimated 4,725 metric tons (or 20 percent) entered Niger as unrecorded commercial imports.

### 5. Peanuts

Peanuts, Niger's traditional cash crop, are grown primarily for their oil. The waste product, along with peanut shells and hay, has economic value as livestock feed. About eighty-five percent of Niger's peanut production is grown in the departments of Zinder and Maradi. According to GON sources, yields range between 400 and 500 kg per hectare. Some analysts consider these yields to be too high. Plant disease, declining prices on world markets and the shift in production by farmers toward other legumes have caused a sharp drop in production over the past decade. The 1982 peanut harvest of 87,138 metric tons represented only one-third of the highest pre-drought level. A good part of this reduction is compensated for by unofficial imports of peanuts from Nigeria.

The Government recognizes the value of peanuts and is trying to revitalize the crop. The GON offers the highest official producer price for peanuts across the Sahel, 85 CFA/kg in the shell and 100 CFA/kg shelled.

### 6. Cowpeas (nièbe)

Cowpea production has followed an upward trend since the late 1960's with steady improvements in yields. Cowpeas are valuable as an alternative food crop but also as a foreign exchange earner through exports to Nigeria. Prices for cowpeas near border markets were 300 CFA/tia, or approximately 120 CFA/kg.

According to GON figures, estimated total production for 1982/83 was 290,535 metric tons. Primary producing regions are Maradi (90,647 MT), Zinder (71,059 MT), Tahoua (54,614 MT) and Niamey (47,030 MT). The GON is

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sponsoring an active media campaign to promote cowpea production and domestic consumption. However, domestic storage possibilities are constrained by bruchid beetle infestation. Large quantities of this crop are being unofficially exported to Nigeria to meet seasonal cash needs. SONARA has entered the business of exporting cowpeas, about 15,000 tons annually, as a partial means of making up for the loss of its former peanut revenues.

## 7. Cotton

The production of cotton has dropped dramatically since the early seventies with the exception of a record harvest in 1975 (11,130 metric tons). Overall production dropped from 4,500 tons in 1979/80 to 2,900 tons in 1980/81, the latest year for which official figures are available. Reasons for decreased production include the continuing effects of the drought, insect infestation and the high costs of inputs required. Production is greatest in the Dosso departement, followed by Maradi, Tahoua, and Zinder.

Although cotton acreage is less than one-fifth what it was in 1971/72, yields have reportedly improved an average 575 kg per hectare. In 1978, an estimated 7,535 hectares were planted in cotton, including 660 irrigated hectares. Five cotton-gins are currently in operation -- one in Maradi (6,000 MT capacity), two in Madaoua (12,000 MT total), one in Gaya (1,500 MT) and one in Niamey (500 MT). While cotton fiber is intended primarily for local use by Niger's textile industry, the cotton seeds, rich in oil, are either processed into a low grade cottonseed oil, kept for future planting, or exported.

## B. Grain Marketing and Distribution

This section examines the role of market forces in supplying Niger's need for staple grains, especially millet and sorghum.

Niger has a lively grain trade with easy entry to and exit from markets. The Government's grain marketing board, OPVN, exists side by side with the private grain sector.

OPVN is responsible for maintaining food security stocks for use in emergency but also for supplying the grain-deficit urban areas and keeping prices and supplies stable. Civil servants and others are entitled to grain rations from OPVN warehouses, mainly in Niamey and departmental capitals, at preferential prices. The general public can buy from OPVN at fixed prices during six months of the year until the start of the next harvest. The price charged by OPVN is often below its high overhead and operating margins but higher than free market prices. OPVN's prices, however, have little direct influence on market prices since they control a relatively small share of the crop.

Constraints to marketing grain in Niger seem to be functions of supply, (poor crop yields and low production) and physical geography (centers of consumption sometimes great distances from areas of production). Some of the supply problems are overcome by the marketing system itself by recourse to grain imports. Exchange of cattle for grain has always figured prominently in the trade between northern Nigeria and southern Niger, the traditional Hausaland. Well established trade networks on both sides of the border are responsible for bringing significant quantities of Nigerian grain into Niger to make up for

Niger's production shortfalls. Details of the private grain trade and the role of the government are outlined below.

## 1. Market Structure

### a. Private Grain Trade

Like other markets in the Sahel, grain markets in Niger are highly fragmented, involving a large number of participants who trade relatively small quantities of grain (often under 1,000 sacks per year). Most locally produced grain that makes its way into the rural markets is sold predominately by producers themselves. Urban demand is being met primarily by imported grain.

Merchants who import large quantities of grain from Nigeria deal little, if at all, in domestic production. These merchants sell grain wholesale to urban retailers through their own networks and stores. They have neither the physical space nor the available capital to stock and store grain. They are part of the Hausa trading network that has existed for many years. Grain merchants do not appear to deal with other products such as livestock, leaving that to an entirely different set of traders.

Some observers infer that grain markets in Niger reflect the same market structure found in Nigeria. There, three functions can be discerned: assemblers, transporters and wholesalers, of which any two may be performed by the same people or "firms." This delineation of function is part of a well defined patron-client trading relationship in which patron merchants lend money to clients to purchase grain during the loan period and sell it for relatively small profit. The clients amass

enough grain to deliver a set volume as principal and make enough money to repay the interest on the loan at the end of the designated period. Thus, money to finance trading is available throughout the year and stocks are amassed by larger merchants for their own purposes. Turnover is high and it is implied that merchants deal in other products besides grain since profit margins appear to be small.<sup>3</sup>

Little evidence has been found to support the assertion that such a system exists in Niger. Marketed quantities of locally produced grain appear to be far less abundant in Niger than in Nigeria and the necessary commercial network has not evolved to the extent it has in Nigeria simply because the grain is unavailable.

There are no barriers to entry into grain markets since the only requirements are to procure supplies and be able to transport them to the relevant market. Collusion on prices seems not to occur; observed prices of imported grain in urban markets conform consistently across the country with domestic grain prices in rural markets. Market prices in Niger are determined by the exchange rate between the CFA franc and the naira, market prices in Nigeria, and transport costs to Niger and within the country.

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<sup>3</sup>See, for example, Center for Research on Economic Development, Marketing, Price Policy and Storage of Food Grains in the Sahel, Vol. II, University of Michigan, 1977.

Hays, H.M., Jr. The Marketing and Storage of Food Grains in Northern Nigeria, Ahmadu Bello University, Zaria, Nigeria, 1975.; and

Clough, Paul, "Farmers and Traders in Hausaland," Development and Change, Vol. 12, 1981, pp. 273-292.

Thus, the necessary conditions for a smoothly and efficiently operating market are largely fulfilled by 1) a homogeneous product, 2) free entry into and exit from the market, 3) a large number of buyers and sellers, and 4) well disseminated market information. But to the Government which observes widely fluctuating intra-seasonal market prices, many buyers and sellers, conspicuous large traders and grain shortages from year to year, such a marketing system seems chaotic, inefficient and requiring regulation. This view is based on the supposition that middle men collude to set prices and thereby control the market. A shock of some sort, it is argued, would easily disrupt the system and demonstrate the need for government regulation.

#### b. Role of the Government

The great Sahelian drought was a shock that compelled the Government to intervene in the marketing system. The OPVN (Office des Produits Vivriers du Niger) was created to establish grain reserves, stabilize price and supply fluctuations and distribute relief supplies. OPVN was established in 1970 with a double mandate:

- 1) "to organize the marketing of the local agricultural food commodities (millet, sorghum, rice), intervening on the market and creating regulating stocks in order to stabilize producer prices, as well as to ensure a stable food supply balance during the lean season and between regions;
- 2) to ensure food security, at the national level, by establishing annual forecasts of availability and requirements, by proposing a programme for storage imports and exports, by participating in

the preparation of national and international food aid programmes and following up their execution".<sup>4</sup>

OPVN was originally authorized monopoly control of grain marketing. It licensed traders and designated buying agents such as village and canton chiefs who purchased grain and sold it to OPVN. As OPVN handled only about 20 percent of the grain market in normal years, its legal monopoly was never effective in practice and was eventually rescinded in 1979. The means by which OPVN bought grain evolved over time to the present system of buying exclusively through farmer cooperatives (UNCC) scattered throughout the country. Its mandate remains the same.

OPVN maintains market stabilization stocks (stock de stabilisation) to regulate supplies and prices throughout the year. The normal yearly market pattern is for prices to be low following the harvest and to increase up to 75 percent by June or July. Prices begin to fall quickly as the next harvest starts to come in during October and November.

As of July 1983, the national stabilization stock stood at 130,000 tons of millet and sorghum. The GON maintains a policy of nation-wide uniform retail pricing in attempt to discourage grain speculation (price arbitrage) by private traders and to provide grain at a more affordable price, to the benefit of urban areas and the grain-deficit north. Most

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<sup>4</sup>Report on Niger's Food and Agricultural Situation, FAO, January 1982.

of the market stabilization grain makes its way to Niamey for rationed purchase by civil servants and other consumers. Storage capacity in Niamey is 25,000 metric tons and turnover of grain stabilization stocks is about 50,000 metric tons annually.

OPVN also ships grain northward into the grain deficit pastoral zone in an effort to moderate price fluctuations for herders who are often compelled to buy grain in the dry season at enormously inflated prices. Only modest quantities of grain ever reach the pastoral zone. Local civil servants typically take a large share of this grain, leaving limited quantities of grain for purchase by the herding population at controlled prices. Thus herders and other local residents derive little benefit from OPVN's stabilization policy.

The cost to OPVN of transporting grain to the north is almost prohibitively expensive. Still, Government food policy requires that OPVN maintain at least a symbolic presence in the north by offering small quantities of grain for sale at fixed prices. This policy option costs dearly.<sup>5</sup>

In addition, OPVN maintains a reserve stock (stock de réserve) for emergency situations. In the event of sudden food shortfall, this stock is intended to serve as a buffer to supply grain until commercial imports

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<sup>5</sup>High overhead and operating costs mean that OPVN functions less efficiently than the private sector, particularly in hauling grain long distances. In the absence of fixed prices, OPVN's grain in the north would cost even more. It is easily hypothesized that by paying OPVN's fixed price, southerners who live in the producing areas where grain prices should be lower are indirectly subsidizing consumption by northerners where prices should be higher. Events of the past nine months appear to bear this out as free market prices along the southern frontier fell considerably below OPVN's fixed price.

or food aid arrive. The level of the reserve stock is calculated using the following formula: 700,000 urban dwellers plus 800,000 herders plus 500,000 marginal farmers times 200 kg/person/year times 0.5 years equals 200,000 metric tons. The reserve stock presently stands at roughly 45,000 tons and is planned for expansion to 65,000 tons by the end of 1983. Roughly one-third of the present stock (15,000 tons) is rotated out onto the market each year and replaced with new grain.

In theory, the reserve stock is to be left untouched except in cases of extreme emergency. In practice, the reserve stock has occasionally been drawn down, most recently after the poor harvest of 1981/82 when the reserve level dipped as low as 12,000 metric tons. OPVN has always taken great care, however, to reconstitute the reserve stock before rebuilding the market stabilization stocks.

While the Government maintains that "food security has no price," it acknowledges that OPVN's operations are costly. OPVN's cumulative losses rose to an estimated 11 billion CFA francs (about \$27.5 million) as of September 30, 1983. The deficit for 1982/83 alone was approximately two billion CFA francs (about \$5 million). Early financial difficulties were manageable, partly because the deficit was relatively small and partly because uranium revenues were still abundant. The dimension of the problem began when uranium revenues declined in 1981/82. The financial situation worsened and reached crisis levels as a result of the 1982/83 buying campaign. At least three factors contribute to OPVN's losses: a) the level of grain stocks maintained by the OPVN; b) official prices which do not reflect costs; and c) poor management.

## 2. Market Prices and Supply Response

### a. Effect of Prices on Production

The effect of producer prices or market prices on grain production in Niger is small. Although a substantial body of literature documents the price responsiveness of African farmers, much of this literature pertains to cash crop production which traditionally receives preferential attention in terms of management, capital, research and other institutional support.<sup>6</sup> This literature does not permit valid inferences about the price responsiveness of the Nigerien grain farmer. Higher prices do not necessarily lead to higher levels of production. In 1981-82, millet production dropped slightly in spite of a 75 percent increase in OPVN's producer price for millet. Table III presents OPVN producer prices from 1977 to 1983.

Table III. OPVN Producer Prices

	<u>1977/78</u>	<u>1978/79</u>	<u>1979/80</u>	<u>1980/81</u>	<u>1981/82</u>	<u>1982/83</u>
			<u>CFA/kg</u>			
Millet	30	40	40	40/45	70	80
Sorghum (White/Red)	30/20	40/35	40/35	40/35	70	80
Rice (Paddy)	45	45	45	45	70	70

Source: Direction d'Agriculture

<sup>6</sup>See for example J.K. Mathia, "A Supply Function for Kenyan Coffee", in East African Economic Review, I:1, 1969; or Edwin Dean, The Supply Response of African Farmers: Theory and Measurement in Malawi, (Amsterdam: North Holland, 1966).

In a study of market prices in Niamey, Borsdorf determined empirically that production of grain was not responsive to price over the period 1961 to 1978.<sup>7</sup> This study found the correlation between grain production and market prices to be 0.246 and the correlation between production and OPVN's producer price even lower, 0.037.

OPVN announces its producer prices one month before harvest — too late for a farmer to decide whether to plant or not. OPVN prices are set to reflect supply and demand conditions, based in part on initial crop projections and also, presumably on harvest levels in northern Nigeria.

Producer prices seem to have little influence on how much farmers will grow, but but prices do influence to whom they will sell. OPVN is a guaranteed purchaser of last resort. Until the 1982/83 buying campaign, OPVN set its producer prices lower than market producer prices and consequently, did not buy very much. Although OPVN's prices have increased steadily in nominal terms since 1977/78, OPVN has been a price follower with little influence on market prices until 1982/83 when its producer price for millet and sorghum slightly exceeded market prices. Then, OPVN made record purchases of grain.

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<sup>7</sup>Borsdorf, Roe, "Marketing Profile: Cereals and Cash Crops" (Niger Agriculture Sector Assessment; Volume II, Part F), 1979, page 17.

b. Movements of Farmer-held Grain Reserves

In 1982/83 OPVN raised its producer price by 14.3 percent (from 70 CFA/kg to 80 CFA/kg). OPVN also purchased more grain from farmers. The increase was 51.4 percent (from 31,586 metric tons to 47,810 metric tons). Were farmers drawing down their on-farm reserves simply to take advantage of the higher price?

Probably not. First, it should be noted that the combined harvest for millet and sorghum increased by over 70,000 metric tons in 1982/83. Thus, there was a large marketable surplus. Second, the method of purchase changed. Instead of selling through traditional chiefs, farmers could receive payment in cash through farmer cooperatives (presumably more honest and efficient). Therefore, farmers were given a better deal in 1982/83 and had greater incentive to sell their harvest.

Farmers make their own quantitative and qualitative estimates of how much grain is required to be kept on the farm based on household needs and seed requirements. Once these needs are met, they may sell their surplus. The decision to market crops depends on a number of factors, including the level of on-farm stocks.<sup>8</sup> Consequently, marketed production varies much more than the total production.

There is little agreement on methodologies for accurately estimating farmer-held grain reserves. Site visitations of farm granaries are not helpful. Farmers are reluctant to show their reserves because they must maintain proper storage of grain that may have to last up to several

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<sup>8</sup> CKED, op cit; p. 56.

years. If only one granary is opened for inspection and the others left sealed, it is impossible to estimate the total volume of contents. Volumes of millet and sorghum in storage are difficult to estimate anyway because these crops are usually stored on the stalk or panicle until consumed.

Do higher producer prices compel farmers to market increased portions of their harvest? Do farmers sell a portion of their crop at harvest time to meet certain immediate cash needs? We do not know the answers to these questions. Some research indicates that with the increasing monetization of the economy and the possibility of earning money from other non-farm sources, the need to sell grain may have diminished.<sup>9</sup> More farm-level research must be undertaken to document the decision-making process.

### c. Marketing Margins

One important element in the marketing chain that has seldom been investigated is the spread between producer and market prices. If this spread could be calculated, judgments could be made on the efficiency of the local markets (and UPVN) in passing along costs and calculating the profits of those selling grain. The price offered by a merchant will be determined by the location relative to the market or a road, the credit arrangement made by the farmer, and any number of other factors. Selling to the cooperative may be theoretically a good option, but it may

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<sup>9</sup>Kaynaut, Claude. Synthesis of Maradi Department study, Cahiers du Centre d'Etudes et de Recherches Ethnologiques, Universite de Bordeaux, 1982.

be inconvenient or impractical for other reasons. Moreover, social obligations may require a quick sale for a low price, or for gift giving, which nets no financial gain, but enhances social status.

Data are needed on prices actually paid to farmers and to whom they sell to discover what they receive and how costs are apportioned out in the marketing system. With these price data, it would be possible to discern the pattern of sales, how marketing decisions are made, and what the options are for farmers to sell their products. This kind of data collection and analysis at the farm level on marketing decision-making is being undertaken by ICRISAT in Niger, but little else of a systematic nature has been done on marketing margins.

Informal interviews of grain dealers suggest relatively small profit margins on grain transactions, between 250 and 500 CFA francs per 100 kg. These small margins are possible due to low overhead and rapid turnover of stocks.

#### d. Grain Imports

Most years, a significant quantity of grain, primarily sorghum, is imported from Nigeria. Some grain is imported through OPVN; some remains unrecorded. The volume of unrecorded trade fluctuates with respect to:

- 1) the unofficial exchange rate between the CFA franc and the Naira;
- 2) market prices in Nigeria; and 3) supply and demand conditions in Niger.

The unofficial exchange rate between the CFA franc and Naira indicate which trading partner is favored. Official, unofficial and parity exchange rates from 1975 to 1982 are compared in Table IV.

The comparison of these exchange rates reveals similar movements from year to year. The parity exchange rate theoretically indicates the real buying power of the CFA franc vis a vis the Naira, since both currencies are deflated by the consumer price index (CPI). Except for 1977, the parity exchange rate indicates a weaker CFA franc vis-a-vis the Naira than the unofficial exchange rate (that is it takes more CFA francs at the parity exchange rate to purchase one Naira than it does at the unofficial exchange rate). The direction of the parity and unofficial exchange rates diverged in 1982 from the previous four-year trend.

Table IV. Market Exchange Rates, CFA francs to One Naira

	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
Official Exchange Rates	328.22	381.38	381.13	355.27	352.92	386.61	442.7	482.48
Recorded Unofficial Market Exchange Rates	243.33	279.40	240.67	199.92	203.13	232.57	296.64	293.86
Parity Exchange Rates	243.33	281.20	234.34	209.94	221.0	255.43	320.24	326.27

Sources: Official exchange rates and CPI figures from IMF, International Financial Statistics; unofficial market exchange rates from Pick's Currency Yearbook, 1979, and averages from Pick's Monthly Bulletins; parity exchange rate calculated by using the black market rate reported by Pick's Currency Yearbook in the following formula: exchange rate times Nigerian CPI/Nigerien CPI. 1975 = 100 for CPI.

Note: 1982 unofficial market and parity exchange rates are based on ten months of observations; CPI figures for Niger are estimated from first two quarters of data for 1982, and for the entire year in Nigeria.

If exchange rates were the sole determinant of direction of trade, in this case, trade would have favored exports of grain from Niger to Nigeria up to 1982, as the Government contends was happening.<sup>10</sup>

Table IV does not show the sharp reversal in exchange rates since 1982, reflecting in part the drop in Nigeria's oil export earnings and higher domestic inflation rate. The unofficial exchange rate fell to 250 CFA in October 1982 and dropped again to about 215 CFA in March 1983. Thus, the CFA franc is much stronger now than it used to be and terms of trade favor exports of grain from Nigeria to Niger.

Grain prices in Nigeria also influence grain imports. If production is sufficient in Niger to allow surpluses to be exported and the price is attractive in Nigeria, Niger will export grain. Conversely, if supplies are ample in Nigeria (more often the case), with a favorable exchange rate for Nigerien merchants, grain will be imported from Nigeria. This was the situation during the 1982/83 buying campaign.

In the absence of grain market prices for Nigeria, the Team used official producer prices as proxy figures to give a rough indication of the profitability of this trade.<sup>11</sup> For comparison, Table V compares producer prices in Nigeria and Niger. Nigerien producer prices have been converted to Naira to indicate the theoretic attractiveness for Nigerien grain dealers to buy or sell in Nigeria.

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<sup>10</sup> Conceivably, quarterly or monthly fluctuations in these exchange rates are more likely to induce trade than inter-annual fluctuations.

<sup>11</sup> Use of official producer prices is an admittedly crude means of approximating market prices which are usually higher. Use of official producer prices for both countries, however, net out these differences.

Table V. Millet Producer Price Comparison between Nigeria and Niger

	<u>1976/77</u>	<u>1977/78</u>	<u>1978/79</u>	<u>1979/80</u>	<u>1980/81</u>	<u>1981/82</u>	<u>1982/83</u>
Nigeria (Naira/kg)	.80	1.10	1.10	2.20	2.20	3.21	3.30
FCFA to Naira	.84	.94	.84	.88	1.15	2.56	2.61

Sources: IBRD and Direction d'Agriculture.

Note: FCFA to Naira is calculated using parity exchange rate.  
1982 Nigerian producer price is estimated.

Table V shows market prices to be more favorable to producers in Nigeria than in Niger. This finding supports the GON's contention that much of Niger's grain is exported. But the general pattern of grain is moving northward rather than southward.

If market prices are higher in Nigeria, why would Nigerian wholesalers want to export grain to Niger? An answer to this question must recognize the fairly constant demand for grain in Niger and the long established trading system on both sides of the border. Grain was more abundant in Nigeria in 1982/83. Crops were large and prices were low. The change in exchange rates over the past year makes grain from Nigeria quite affordable in Niger. Nigerian currency is restricted. The demand for the CFA franc (a hard currency) may have compelled wholesalers to sell more grain to Niger than usual.

As the following section indicates, Nigerian importers brought in large quantities of grain during 1982-83. OPVN's attractive purchase price, made the trade profitable.

### 3. OPVN's Campaign in 1982/83

#### a. Buying

The 1982/83 grain buying campaign was characterized by several departures from past practice. First, OPVN was authorized to purchase a record amount of grain — 70,000 metric tons. Second, the interministerial National Cereals Committee increased the guaranteed price for millet and sorghum from 70 CFA/kg to 80 CFA/kg. (It is unclear just what factors were taken into consideration to establish this price which slightly exceeded market prices at the time). Third, OPVN would buy only from farmer cooperatives, ending its previous practice of also buying from traditional chiefs and licensed merchants. Easier access to OPVN through the cooperatives would presumably allow more grain to be marketed and find its way into OPVN stocks. Fourth, OPVN would pay cash on the spot for all grain offered, thanks to a sizeable loan from the central bank (BCEAO) of the West African Monetary Union.

OPVN announced its purchase price in September 1982 after an initial crop assessment by the Ministry of Rural Development predicted a marketed surplus of 70,000 metric tons of millet and sorghum. OPVN's buying quota was established at that level although previous targets had never been higher than 50,000 metric tons and then were only partly purchased.

When the campaign opened in October, OPVN had on hand 43,000 metric tons of sorghum and 40,000 metric tons of rice which it had purchased commercially in 1981/82. In addition, 40,000 metric tons of food aid were in storage. This food aid remained from supplies provided by various donors during 1982. Thus, total reserves stood at 123,000 metric

tons. At most, OPVN needed to purchase 35,000 metric tons — an additional 20,000 metric tons to bring the reserve stock to 65,000 metric tons plus replacement of the 15,000 metric tons normally turned over during the year. Yet for some reason the grain purchase target was raised to 70,000 metric tons.

As the buying campaign progressed, little domestic grain was purchased through the cooperatives (UNCC). The harvest turned out to be mediocre and late. Many farmers were forced to re-seed and few had harvested grain to sell at the beginning of the buying campaign. By late November only 15,000 of the 70,000 metric ton target had been purchased.

Top Government officials were alarmed. Representatives of the wholesalers' union called on the President and received approval to supply the needed grain to OPVN by importing it from Nigeria. In turn, OPVN offered 8500 CFA per 100 kg sack, or a premium of 5 CFA/kg for having the grain delivered directly to OPVN warehouses. Purchases began in December as merchants quickly sold their available supplies and imported more.

Cooperative purchases began to pick up around the same time as farmers began to deliver the delayed harvest to the cooperatives. By the end of January 1983, OPVN had purchased over 47,000 tons of domestic millet and sorghum. Purchases of grain imports from Nigeria amounted to more than 38,700 tons, or nearly 45 percent of all grain purchased. By the time OPVN called off the campaign at the end of February, it had purchased some 86,600 tons, about 23.7 percent above its quota. These purchases are summarized in Table VI below, compared to the purchases made in 1981/82.

Table VI. OPVN Grain Purchases, 1981/82 and 1982/83

<u>Department</u>	1981/82		1982/83	
	<u>UNCC</u>	<u>Traditional Chiefs</u>	<u>UNCC</u>	<u>Wholesalers</u>
Niamey	—	5,568	1,557	—
Dosso	—	3,541	2,775	—
Diffa	—	535	2,388	—
Zinder	—	9,894	21,000	7,600
Maradi	—	7,788	17,590	19,688
Tahoua	—	4,260	2,500	11,500
Agadez	—	—	—	—
Total	—	31,586	47,810	38,788

Source: OPVN, UNCC.

By the end of the buying campaign, OPVN owned about 221,000 metric tons of grain, nearly 60,000 metric tons more than it could properly store. The direct income transfer from OPVN for these purchases amounted to 3.8 billion CFA francs to the cooperatives and 3.3 billion francs to the grain dealers, for a total of more than 7.1 billion CFA francs.

#### b. Selling

OPVN normally opens its stores for fixed price retail sales each April. OPVN sells at 120 CFA/kg to recoup transport, storage, and administrative costs. However, OPVN's full stores and bags of grain stacked in pyramids outdoors dampened market prices. Even in July, when prices are normally climbing upward to their highest, millet was still selling for only 70-80 CFA/kg in the markets. In view of its uncompetitive price, OPVN sold very little grain and eventually closed its doors to the public.

In order to finance OPVN's buying campaign, the GON borrowed about 7.6 billion francs from the BCEAO, a sum more than one billion francs greater than the GON's entire development budget. Interest on these loans was held to 10.5 percent but then increased to 17.5 percent after nine months in September 1983. OPVN needs more storage capacity and it desperately needs to sell some of its grain to defray the cost of these loans and interest payments. OPVN petitioned the donor community twice in March and April to either a) buy some of this surplus grain for food aid use in neighboring countries, or b) help reduce OPVN's debt with cash grants. A few donors responded, one by rushing temporary storage facilities for 20,000 tons before the start of the rains. In any case, OPVN still has much more grain than it needs or can afford to keep. The longer the grain remains unsold, the greater the risk of severe financial loss.

c. Questions Raised by the Buying Campaign

The experience of the 1982/83 buying campaign raises several questions concerning food policy and management.

Why did OPVN establish such a high buying target? The disappointing experience of the previous year, 1981/82, appears to be a partial answer. In a widely publicized statement based on MDR's early crop estimates, the President announced that Niger was about to reach self-sufficiency in grain production. This turned out not to be the case. The Government was forced to draw down its reserve stocks, purchase 85,000 metric tons of sorghum and rice and appeal for 50,000 metric tons of food aid. In late 1982, when OPVN projected a large marketed surplus of 70,000 tons, the Government quickly seized upon

the opportunity to make right its claim of self-sufficiency from the previous year. Thus, the quota was set at 70,000 metric tons.

Why did OPVN continue buying grain above the 70,000 metric ton limit? In view of the Government's pledge that OPVN would buy any surplus grain grown in Niger, why didn't OPVN stop buying imported grain from the wholesalers once the cooperatives began selling domestic grain to OPVN? The answer appears to be that the enthusiastic response elicited by an unusually high purchase target and the promise of above market prices paid in cash simply overran OPVN's managerial capabilities. To maintain credibility with the farmers, cooperatives and grain dealers, OPVN kept buying grain. By the time OPVN headquarters in Niamey began tallying the reported purchases, the target was already exceeded. OPVN finally called off the buying campaign on February 24, 1983, but not until it had purchased 86,600 metric tons of grain at a very high cost to the Government.

### C. Economic Zones and Population Estimates

The following discussion presents information on Niger's three economic zones: the agro-pastoral zone, the pastoral zone and the urban zone.

#### 1. The Agro-Pastoral Zone

Most of the country's agricultural activity takes place in the southern agro-pastoral zone where rainfall is most favorable and land most productive. Three departments (Dosso, Maradi and Zinder) account for almost 60 percent of the total crop production. When there is a marketable surplus, OPVN buys domestic sorghum and millet from this zone to supply the urban and pastoral zones.

Approximately 70 percent of Niger's population lives in the agro-pastoral zone. Population density averages above 40 people/km<sup>2</sup>. People are predominantly sedentary agriculturalists who also keep animals, mostly small ruminants. Although the dominant economic activity is crop cultivation, there are growing opportunities for off-farm employment. People in this zone maintain the highest per capita grain consumption, approximately 210 kilograms per person annually.

#### 2. The Pastoral Zone

To the north, the pastoral zone stretches well into the arid zones of the country. To the south, the pastoral zone is not clearly demarcated because livestock raising is also common throughout the agro-pastoral zone. Some crops are grown throughout the pastoral zone, but livestock production dominates regions with less than 400 mm of annual rainfall. The pastoral zone is sparsely populated by nomadic pastoralists in search

of forage and water for their cattle. Density in the pastoral zone often falls below 20 inhabitants/km<sup>2</sup>.

Diets consist primarily of animal protein, mainly in the form of milk, supplemented by grains and other foods purchased with receipts from the sale of animals and animal products. Grain consumption for the pastoralists is approximately 170 kg per person per year. The pastoral zone is a grain-deficit area. Since supplies must be shipped long distances from the agriculture belt, grain is expensive throughout much of the year.

The commercial relationship between the pastoral population and the sedentary agricultural population has evolved in recent years as economic and social forces have wrought change in both societies. Evidence suggests that terms of trade for many pastoralists have declined. The prices of products they sell have not kept pace with increases in the prices of products they consume.

### 3. The Urban Zone

The urban population of Niger is growing at an annual rate of 7.27 percent. It reached an estimated 917,300 people at the end of 1983, representing 15.1 percent of the national population. The department of Niamey had a population estimated at 1.33 million at the end of 1981. One quarter of this population probably lives in the city itself.

Consumption in Niamey and other urban areas is subsidized by the Government which buys grain throughout the country and sells it to urban residents at a price below its handling costs. Average per capita grain consumption is estimated at 180 kg per year as many urbanites consume calories from a wider array of foods.

TABLE VII

Nigerien Population Estimates  
(thousands of inhabitants) \*

	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>
	<u>Census</u>						
		<u>Percent</u>	<u>Growth</u>				
		<u>Rate</u>					
1. Agro-Pastoral (percent of total)	3,756.4 (73.7)	2.43	3,849,170 (73.4)	3,943,891 (73.1)	4,036,522 (72.7)	4,137,950 (72.4)	4,237,272 (72.0)
2. Pastoral (percent of total)	740.0 (14.5)	1.43	744,661 (14.3)	760,723 (14.1)	771,770 (13.9)	783,010 (13.7)	794,489 (13.5)
3. Urban (percent of total)	602.0 (11.8)	7.27	645,024 (12.3)	695,981 (12.9)	744,008 (13.4)	794,441 (13.9)	853,340 (14.5)
4. Total	5,089.4 (100.0)	2.77	5,244.1 (100.0)	5,395.2 (100.0)	5,552.3 (100.0)	5,715.4 (100.0)	5,885.1 (100.0)
							6,061.3 (100.0)

1977 census figures from Ministere du Plan. Figures may not add due to rounding.

## D. Food Consumption Issues

### 1. Caloric Requirements

This section estimates caloric requirements for urban dwellers, agro-pastoralists and nomadic pastoralists, using population statistics, occupational classifications for Niger, and FAO guidelines on caloric requirements for activity, age, sex and physiological state. Tables VIII, IX and X present estimates of per capita caloric requirements for each population group. In characterizing energy expenditure, choices favored error toward overestimating rather than underestimating activity. Thus, the requirements cited may be considered conservative estimates.

The weighted average of per capita caloric requirements calculated for each population group is 2,194 calories. This figure can be rounded up to 2,200. The analysis uses 2,200 calories as the per capita requirement of the population of Niger. This estimate is within the range suggested by other analysts.

### 2. Nutritional Status

Although the nutritional status of the population of Niger has never been measured, isolated small studies of young children suggest that a greater incidence of undernutrition and malnutrition occurs in the rural rather than urban areas.<sup>12, 13, 14</sup>

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<sup>12</sup>Loutan, L. Health and Nutrition in a Group of Wodaabe Herders in Central Niger, 1982.

<sup>13</sup>Niamey Department Development Project, MRD Government of Niger Nutrition Survey June-August 1980.

<sup>14</sup>Undernutrition is defined as inadequate consumption of calories.

In the rural areas, weight loss for all members of the family occurs during certain seasons of the year whether or not the country produces sufficient millet and sorghum to meet aggregate average calorie needs. This happens because food is not uniformly available throughout the year and because periods of greatest market demand coincide with periods of lowest supply. Children under five years are especially vulnerable to chronic malnutrition.<sup>15</sup> Chronic malnutrition for this group reached 17 percent during the rainy planting months, even though 1979 was considered a good crop production year, within the Niamey Department in 1980.

For urban residents, studies do not report seasonal weight loss of household members. Urban dwellers comprise 15 percent of the Nigerien population. Although they are subject to a similar seasonal market trend, they differ from their rural counterparts in three major respects: 1) they are less subject to seasonal increases in caloric requirements caused by labor-intensive agricultural activity; 2) the salaried jobs of most urban families offer effective demand even when food prices rise; 3) the fluctuations of seasonal market trends are buffered by subsidized grain prices for urban consumers.

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<sup>15</sup> Chronic malnutrition is defined as less than 90 percent of the reference median weight for age.

In Africa, weight loss is a manifestation of malnutrition. When the body does not have enough calories to maintain all body functions, it first draws on fat reserves. However, in rural Niger, very few agro-pastoralists or nomadic pastoralists are fat. When they lose weight, they are losing lean tissue: the muscle required to support the skeleton and do work. Their weight loss amounts to burning the interior wall of a house to keep the house warm.

Between the two rural populations, the nomadic-pastoralists can be presumed to be at higher risk of seasonal malnutrition. Their hardship period lasts one month longer than that of the agro-pastoralists. They are wholly dependent on distant markets which present unfavorable terms of trade during their hardship period while agro-pastoralists at least benefit from milk availability during their hardship period. Finally, the dependence of nomadic pastoralists on one food source, milk, does not permit them to spread their risk as evenly as agro-pastoralists.

Table VIII. Estimated Caloric Requirements per Capita for Urban Population 1/, 2/, 3/

Groups Age/Sex/Physiological State	Occupation/ Activity	Percentage Population	FAO Caloric Requirements	Weighted Calor Requirements
0-4 years male and female		.192	1346	258.4
5-14 years male		.1341	2293	307.6
5-14 years female		.1262	2152	271.7
15-64 years male	Sedentary Salaried	.069	2447	168.8
	Sedentary Non-salaried	.2019	2447	494.1
15-64 years female	Sedentary Salaried	.0067	1927	12.9
	Active Non-salaried	.1975	1990	393.2
Pregnant or Lactating	Active Non-salaried	.0833	2660	221.7
65 years and above male	Sedentary Non-salaried	.0117	2310	27.1
female	Sedentary Non-salaried	.0110	1690	18.7
			<u>Total Per Capita Caloric Requirement</u>	<u>2,174.00</u>

Footnotes to Table VIII

1/ On the basis of an estimated population of 855,100.

2/ Labor estimates have been derived from the following sources:

A. Ministère de Plan, D.P.P., Service des Etudes. "Estimations d'Après les Données du Ministère de la Fonction Publique et du Travail, © 1975.

B. Disaggregating the above figures by gender, the percentage of women in the salaried work force is estimated at percent by the women in Development Officer, USAID/Niger.

3/ Calorie requirements have been derived from the following sources:

A. The Food and Agriculture Organization, Rome, Italy, 1974.

B. The daily caloric requirement per capita refers to the calories needed to sustain most persons in health taking account age, sex, physiological and activity distributions.

C. The percentage of pregnant and lactating women in the total population is estimated at four percent by the Development Officer, USAID/Niger.

D. The percentage of salaried to non salaried workers is derived from.

Table X. Estimated Caloric Requirements per Capita for the Nomadic Population 1/

Groups	Occupation/ Activity	Percentage Population	FAO Caloric Requirements	Weighted Ca Requirements
Age/Sex/Physiological State				
0-4 years male and female		.192	1346	258.4
5-14 years male		.1341	2293	307.6
5-14 years female		.1262	2152	271.7
15-64 years male	Very Active	.2657	2667	708.6
15-64 years female	Very active	.1667	2300	383.4
Pregnant or lactating	Active	.0833	2660	221.6
65 years and above male	Sedentary	.0117	2310	27.1
female	Sedentary	.0110	1690	18.7
			<u>Total Per Capita Caloric Requirement</u>	<u>2,197.1</u>

1/ On the basis of an estimated population of 794,400.

Table X. Estimated Caloric Requirements per Capita for Agro-Pastoral Population 1/

Groups	Occupation/ Activity	Percentage Population	FAO Caloric Requirements	Weighted Caloric Requirements
Age/Sex/Physiological State				
0-4 years male and female		.192	1346	258.4
5-14 years male		.1341	2293	307.6
5-14 years female		.1262	2152	271.7
15-64 years male	Very Active	.2657	2667	708.6
15-64 years female	Very active	.1667	2300	383.4
Pregnant or lactating	Active	.0833	2660	221.6
65 years and above male	Sedentary	.0117	2310	27.1
female	Sedentary	.0110	1690	18.7
			<u>Total Per Capita Caloric Requirement</u>	<u>2,197.1</u>

1/ On the basis of an estimated population of 4,235,600.

### 3. Estimating Food Consumption

Understanding the dietary patterns of a country's inhabitants has several important uses. It allows planners to assess the relative contribution of major food groups to the diet in terms of their influence on both nutritional quality and calories. It permits planners to analyze food availability with greater sophistication. The basic food staples of Niger are: grains and cereals (mostly millet and sorghum); roots; pulses (mostly cowpeas and peanuts); livestock products (mostly milk) and fish; fruits and vegetables; and sugar. Although food consumption data for Niger are not available, estimates can be derived from quantitative data and detailed qualitative description. This analysis focuses on rural food consumption patterns.<sup>15a</sup>

Among rural people working in the agricultural sector, food consumption needs vary seasonally, depending on specific labor activities. In rural Niger, there are two broad types of agricultural systems: transhumant cattle herding, as practiced by nomadic pastoralists; and sedentary agriculture with livestock, as practiced by the agro-pastoralists. The following section describes the likely

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<sup>15a</sup> Urban consumption patterns are not included for the following reasons: Niger is a predominately rural country. Only 15.1 percent of the population live in cities or towns with more than 5,000 people. Of this, 3.5 percent are salaried implying a higher standard of living and a greater access to quantity and variety of foods than their rural counterparts. Another 6.5 percent are relatively recent arrivals or seasonal migrants who maintain strong ties to rural areas and access to rural food. The final 5.1 percent should represent those urban poor with little access to food by income or rural ties. Given the absence of data on this group, and their small number, they have not been included in the current analysis.

dietary patterns of nomadic pastoralists and agro-pastoralists during the seasons of their respective agricultural years. Data presented in Tables XI and XII are not based on actual consumption data. Therefore, they do not represent what people actually consume or how many calories they consume. Rather they have been constructed to describe probable dietary patterns and the changes in those patterns based on what is known, has been observed, or has been actually calculated for a small number of persons.

The tables take their quantitative basis from FAO food balance sheets. Percentage weights have been converted to percentage contribution of calories to eliminate distortion caused by the weight of water in foods and to establish an appropriate unit base. Caloric contribution has then been modified to reflect the effects of each season. In both agricultural systems, more information was available on the consumption of non-grain foods than on grain consumption. Therefore the percent contributions of non-grain foods have been derived first and grain contribution calculated by difference from 100.

Table construction proceeded by estimating the percent contribution of foods whose seasonal availabilities have been described and then estimating the percent contribution of foods whose availability is less well understood.

#### 4. Agro-Pastoralist Food Consumption

Table XI presents the estimated caloric contribution of key food groups to the agro-pastoral diet by season. Diet during each season is discussed below.

Table XI. Estimated Caloric Contribution of Key Food Groups to the Agro-Pastoral Diet by Season 1/, 2/

Hausa Food Categories	Agro-Pastoral Seasons						Annual Average Expec Percentage Caloric Contribution of Key Food Groups to the
	Raani late May June	Damuna July August	Kaakau Sept Oct	Nov	Daari Dec Jan Feb	Raani March April early May	
							Percent
Milk	0	10	10	7	28	0	11
Grain	80	74	70	71	55	80	70
Legumes Pulses	3	3	7	9	7	4	5
Roots Tubers	4	4	1	1	1	7	3
Meat Fish	2	1	1	2	2	1	2
Oil	6	5	5	5	3	6	5
Fruit Vegetables	2	2	3	2	3	1	2
Sugar	3	1	3	3	1	1	2
Apparent Nutritional Adequacy	Marginal Quality and Calories	Improved Quality Insufficient Calories	Good Quality and Calories	Good Quality and Calories	Good Quality and Calories	Poor Quality and Calories	

1/ Dr. John Curry, 1983, personal communication.

2/ Wentling, M.G. 1983, "Niamey Department Development Project: Managing rural development with minimal evidence" Master's Thesis, Cornell University: Ithaca, New York.

a. Late May and June—The Hot, Dry Season (Raari in Hausa)

During the hot, dry season in May and June, Hausa depend on grains or stored cassava, sweet potatoes and potatoes. Little or no milk is available. The high percentage contribution of grain to the diet increases demand for an agent to render the staple palatable and digestible. A slight increase in meat consumption due to an increase in livestock deaths during this season may cushion the acuteness of this demand somewhat. However, with low availability of cowpeas, groundnuts, bambarra nuts and tiger nuts, no availability of milk products and only a slight increase in meat, demand for an agent, such as oil, is still high. In some areas sugar cane is harvested and a variety of mangoes ripen at this time. However, diet quality, in terms of variety, is marginal. If caloric needs are not quite met by adults, then protein/calorie needs probably will not be met by children. The major source of protein in this season is grain. If caloric requirements are met, protein requirements will be met. When diets provide a marginal amount of calories, children and pregnant and lactating women, who require more protein, are at increased risk of being protein deficient.

d. July and August—The Rainy Season (Damuna in Hausa)

During July and August, entire households are involved in planting millet, fonio, sorghum, and, depending on the region, corn, rice and wheat. Minor crops such as pumpkins, tomatoes, okra and red sorrel are planted. Wild greens from the bush are harvested. Cattle and small ruminants, not leased to nomadic pastoralists, produce good quantities of milk. This is a labor-intensive and the most stressful season for agro-pastoralists, when undernutrition and malnutrition occur.

The time and energy required for planting reduces time available for adequate food preparation. Nevertheless, when milk is available, the impact of grain shortages may be minimized. Bio-chemical efficiency in absorbing, retaining, and utilizing nutrients at low calorie intake is enhanced when dietary quality is improved. Milk greatly improves dietary quality. Therefore, even at low levels of intake, milk increases the nutritional power of grains. Physically, milk can and does substitute for oil. It contains enough fat to confer similar properties to grain dishes. It improves palatability by imparting the taste of fat. It coats and separates starch granules that eliminates a mouth feeling of gluey texture. Milk is an important ingredient of boule, a morning millet gruel thinned with milk and fortified with sugar. In the evening, millet is eaten as a couscous with a spicy sauce, or as a heavy porridge, or as a pate of dough-like consistency. Households owning livestock with access to milk have a distinct nutritional advantage over those who do not.

c. September and October--The Harvest Season (Kaakau in Hausa)

Grains and legumes, as well as wet season garden vegetables, are harvested as they mature in September and October. Some cowpeas are harvested early and are boiled and eaten while still green, providing some of the first relief from the hunger of the preceding planting season. Oilseeds, such as groundnuts, bambara nuts and tiger nuts, must be further dried before they can be harvested. Milk production remains high because agro-pastoralists supplement livestock grazing with dried cowpea leaves, groundnut hay and pressed groundnut cake. Baobab leaves are gathered. Wild greens such as Cadaba farinosa, Salvadora

persica, Maerua grassifolis and Ceratotheca sesamoides continue to be gathered.<sup>16</sup> Agro-pastoralists, as well as their animals, eat well.

Income from the harvest increases effective demand for sugar and oil, two concentrated sources of calories. With access to cowpeas and oil, women will prepare and sell fried bean cakes, kosai at the markets. They also sell other prepared foods such as: galettes, a pancake of millet flour, salt, and onion fried on earthen griddles brushed in peanut oil; fanke, a puff ball from white wheat flour and sugar fried in oil; masa, a fried pancake of millet flour, salt, chopped onion, pounded red pepper and pounded ginger.

An essential ingredient of these marketable prepared foods is oil. This oil might represent a family's normal sauce ration now being invested in income-generating activity, milk substituting for oil at home. Few cowpeas are stored because of susceptibility to infestation by the bruchid beetle. Therefore, most cowpeas not sold are consumed during September, October and November. Derived statistics on yield, proportion marketed and proportion consumed, indicate that cowpeas contribute five percent of total calories to the diet.<sup>17</sup>

Festivals and family ceremonies begin at the end of the harvest season. During this time complex and richer dishes are prepared more often. Weight that has been previously lost is regained by adults and mostly regained by children. Hausa acquire a state of positive energy balance which implies that requirements for both calories and nutrients are being met.

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<sup>16</sup>Wentling,, M.G. 1983, "Niamey Department Development Project: Managing rural development with minimal evidence." Masters Thesis, Cornell University: Ithaca, New York.

<sup>17</sup>ibid.

a. November—The Mini Hot Season

Harvesting of cowpeas and groundnuts continues in November.

Consumption of cowpeas may reach its highest level.

Locusts are captured and served fried. Milk production decreases slightly but availability of other commodities may remain fairly constant. Some men leave for off-farm employment. Diets could remain high in quality and sufficient in calories.

e. December, January and February--The Dry, Cold Season (Daari in Hausa)

In December, January and February, the availability of milk increases dramatically. At this time the nomadic pastoralists return to locations nearer the agro-pastoralists. Payments for leased cows may be made in milk or clarified butter. Nomadic butter is also bartered for grain. There is less reliance on grains and therefore a lower requirement for oil. Winter vegetable seedlings are started and later potatoes, sweet potatoes, onions, tomatoes, pimento, okra, pepper and lettuce will be harvested. All of these vegetables find their way to market as well as the family pot.

Onions are sold almost exclusively by men who have not migrated to off-farm labor. Jujubees, a good source of vitamin C, and another variety of mango, ripen at this time. They are sold or consumed. Diet quality is high due to trading possibilities with the nomadic pastoralists as well as the continued availability of fruits and vegetables. Agro-pastoralists living just below the pastoral belt hold the markets to which pastoralists come to trade. Caloric requirements may reasonably be met by virtue of milk availability, lower energy expenditure, and fewer mouths to feed.

f. March, April and May—The Hot, Dry Season (Intense Heat—Kaanii in Hausa)

During March, April and May, Hausa eat more grains and oil, as milk becomes less available. Availability of cowpeas begins to decline and greater use is made of stored cassava, sweet potatoes and potatoes. Prices for livestock drop and best efforts are made to conserve the animals during this period. Fruit and vegetable availability diminishes. Resources are spent on obtaining commodities, such as oil, that will render the 80 percent grain diet more palatable. Attempts are made to reduce energy expenditure. The diet is marginal in quality and perhaps also insufficient in calories.

5. Nomadic-Pastoralist Food Consumption

Table XII presents the estimated caloric contribution of key food groups to the nomadic-pastoralist diet by season.

a. Late May and June—The Hot, Dry Season (Long Interval Between Rains—Kokkobe in Fulani)

During the hot, dry season in May and June, the first infrequent rains allow Fulani pastoralists to move and find fresh pastures. At this time, camels, cattle and small livestock will begin their recovery from a state of famine. Cattle milk is still entirely absent and camel milk is no longer available. Consumption of meat, a negligible part in all seasons, increases slightly if animals die from illness, exhaustion or emaciation.

Table XII. Expected Caloric Contribution of Key Food Groups to the Nomadic-Pastoral Diet by Season 1/, 2/

Food Categories	Nomadic-Pastoral Seasons												Annual Average Expected Percentage Caloric Contribution of Key Food Groups to the
	Kokkobe late May June	Korsol July	Yaawol				Dabbunde Dec Jan	Suckling		Cee Feb Apr early May	Cee May		
			Ndunnngu Aug Sept	Coorol Oct Nov	Coorol Oct Nov	Coorol Oct Nov							
													Percent
Milk	0	90	90	90	90	30	50	1					36
Grain	90	8	5	5	65	45	90						58
Legumes Pulses	0	0	0	0	0	0	0	0					0
Roots Tubers	0	0	0	0	0	0	0	0					0
Meat Fish	2	0	2	2	0	0	0	1					1
Oil	6	0	0	0	0	0	0	6					3
Fruit Vegetables	Trace	Trace	Trace	Trace	3	3	Trace	Trace					1
Sugar	2	2	3	2	2	2	2	2					2
Apparent Nutritional Adequacy	Poor Quality & Insufficient Calories	Sufficient Quality and Good Calories	Sufficient Quality and Good Calories	Sufficient Quality and Good Calories	Good Quality and Calories	Good Quality and Calories	Good Quality and Calories	Poor Quality & Insufficient Calories					

1/ Maliki, Angelo B. 1981, "Herding according to the Wodaabe." Discussion Paper No. 2 of the Niger Range and Livestock Project. Ministry of Rural Development, USAID/Niger: Tahoua, Niger.

2/ Loutan, L. 1982, "Health and nutrition in a group of Wodaabe (Barora) herders in Central Niger." Discussion Paper No. 1 of the Niger Range and Livestock Project. Ministry of Rural Development, USAID/Niger: Tahoua, Niger.

3/ Dr. Cynthia White, 1983, personal communication.

Millet, sorghum and fonio are still the major source of calories. Reliance on grain increases demand for oil. These commodities are obtained from agro-pastoralist markets through sales of jewelry, leather goods, or cattle. Since grain prices are high and livestock prices are low, nomadic purchasing power is low. Pastoralists may still have some dried leaves or wild greens to add to their sauces but they consume an imbalanced 90 percent cereal diet.

Diet quality is low due to lack of variety and insufficient access to sauce ingredients, such as oil. Oil confers calories, essential fatty acids and renders the grain palatable. A hectic camp schedule of long journeys in search of the first green grass does not permit women time to process grain to finer particle sizes which are more easily digested. Total caloric intake is insufficient.

Toward the end of this season, the animals begin to throw off the effects of famine but the pastoralists continue in a state of emaciated weakness until their diet can again be enriched by milk.

b. July—The Beginning Rainy Season (Vegetation Sprouting—Korsol in Fulani)

During July, calves are born and cows start giving milk. Milk production suddenly increases and grain consumption is rapidly phased out. Sauce is not prepared when milk becomes abundant. The butter from milk or milk itself is used in grain dishes. All dairy production is consumed. Barter is not practiced at all. This may reflect priority need for calories in order to successfully regain lost weight. A morning meal often consists of millet and milk consumed with tea and sugar.

The caloric contribution from green tea is significant because of its sugar content. At midday, the meal may involve leftovers or a gruel of thicker consistency. In the evening, a dough or p<sup>â</sup>te is consumed with a complement of butter or curdled milk.

The availability of milk and a few fresh wild plants have the power to improve diet quality tremendously. The process of regaining weight reflects a positive energy balance and a situation where individuals are more than meeting their minimum energy requirements. Korsol represents a rare period where pastoralists are neither voluntarily nor involuntarily rationing their food intake.

c. August and September--The Rainy Season (Storms and Dew--Nduunngu in Fulani)

During the rainy season in August and September, Fulani dietary intake is almost exclusively composed of milk. Grain becomes a feature of the diet only after the new harvest. Diet quality is high because of the characteristics of milk, a food well balanced in protein, fat, carbohydrates and containing an important array of vitamins and minerals. Quality improves further with the arrival of the festival period. Consumption of meat and sugar increases slightly during festivals and family ceremonies. Foods prepared are more complex, richer and more varied, incorporating wild fruits, leaves and seeds. Among the fruits used are Leptadenia hastata, a fruit rich in iron, and Balanites aegyptiaca, a tree bearing fruit rich in vitamins A and C.

d. October and November—End of the Rainy Season and Intermediate Season  
(Yaawol and Coorol in Fulani)

Milk production diminishes during the mini hot season in October and November. Pastures dry out, herds return to eating hay, and the Fulani shift back to grain. At this time, demand for oil doesn't necessarily increase, since milk is in sufficient supply to substitute as a sauce.

Plants, such as wild melons are harvested in October. These are used to make a stew with hot pepper and salt called bete. Animals like both the stew and the raw fruit. They also eat the stem and leaves as forage. In November, jujubees ripen. Children collect them. Women pound them into flour and make a bread. Jujubee bread, akari, can be stored for several months. It is high in calories, vitamins A and C. At this time of year, a potential for good diet quality exists. The ratio between milk and grain is good and if fruits and vegetables remain available, households may be able to meet dietary quality as well as their caloric requirements.

e. December and January—The Cold Season (Dabbunde in Fulani)

During this period, the pastoralists are relatively stationary and their diet is influenced by market availabilities. With adequate water and hay and a more stationary life-style, cow milk production increases. Curds and butter are bartered for grain and fodder. Increased grain consumption does not imply increased demand for oil because butter is in good supply. Good livestock markets at the end of this season allow pastoralists to earn the income they will need for grain and other necessities in the future months. Other items that add nutritional

variation to the diet — for example, macaroni, bread, rice, canned tomato sauce, bouillion cubes, onions and cookies — are obtained at markets. At this time, the Fulani appear to meet minimum caloric requirements. Also, there are fewer mouths to feed because some men and women migrate to non-agricultural jobs in other areas.

f. February, March, April and 1/2 May—The Hot, Dry Season (Transitional and Intense Heat—Suddite and Ceedu in Fulani)

February, March, April and early May are a period of hardship for pastoralists. Temperatures are hot. Energy requirements for well digging and cattle watering are high. Milk is unavailable except for those owning camels. Cereals must be obtained by long journey to agro-pastoralist markets in the south. Grain is paid for with proceeds from earlier sales of cattle. With increasing reliance on grains, pastoralists have a greater need for oil. Although camels give milk during this period, they provide total sauce requirements only for a minority of large holders. At this time, most pastoralists suffer a lack of water, dietary variety, insufficient complementary sauce materials for their monotonous cereal regime and caloric insufficiency.

## 6. Overview of Rural Food Consumption

On the basis of the preceding discussion, the following general comments apply to rural food consumption in Niger.

1) The percentage contribution of grain to diet varies tremendously throughout the year. For nomadic pastoralists, it varies from 5 to 90 percent of all calories. For agro-pastoralists, it varies from 56 to 80 percent of all calories.

2) When grain contributes 80 to 90 percent of all calories, diets are poor in quality and insufficient in calories. This overwhelming reliance on one food for calories is associated with undernutrition and frequently, in the case of growing children or pregnant and lactating women, with malnutrition.<sup>18</sup>

3) The contribution of non-grain foods to the diet is substantial and should not be ignored. For nomadic pastoralists, non-grain foods represent 40 percent of total diet calories on an annual basis. For agro-pastoralists, non-grain foods represent 30 percent of total diet calories on an annual basis. Chief among these foods are milk for nomadic pastoralists and milk, cowpeas and groundnuts for agro-pastoralists. Each food is a good source of protein but groundnuts and milk are most attractive because of their relatively high fat content (see Table XIII).

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<sup>18</sup> Niamey Department Development Project, MRD Government of Niger Nutrition Survey June-August 1980.

When milk and groundnuts provide at least 15 percent of all calories, diet quality rapidly improves. A well balanced diet allows persons to cope more successfully with low calorie intake.<sup>19</sup> On a 2,200 calorie diet, the daily amount of groundnuts or milk required to affect dietary quality is: 2 cups of whole milk, or 1 cup of milk and 12 groundnuts or 24 groundnuts. Good dietary quality allows persons to make the most efficient use of limited calories.

Table XIII. Composition of the Major Food Groups

	<u>% Calories from Fat</u>	<u>% Calories from Protein</u>	<u>% Calories from Carbohydrates</u>
Milk	50	20	30
Grain (millet, sorghum)	6	10	84
Legumes (groundnuts)	71	16	13
Pulses (niebe)	4	26	70
Roots (cassava, sweet potato)	1	4	95
Meat (beef)	35	60	0
Fish	8	29	0
Oil	100	0	0
Fruit averaged with vegetables	0	0	100
Sugar	0	0	100

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<sup>19</sup> Exemplifying this fact are persons in Western cultures suffering from anorexia nervosa who keep themselves alive at starvation calorie levels through expert attention to the nutrient balance of their diets.

4) Foods high in fat (groundnut cake, groundnut oil, milk) make good sauce ingredients or sauce substitutes for cereal dishes. The fat in these foods renders cereals more palatable and prevents them from becoming a gluey mass, thereby making them more digestible. The relationship of oil to grain-based diets should be recognized. In the absence of milk, groundnut cake or meat fat, demand for oil will be highly inelastic because oil confers an essential palatability required for the consumption of grain dishes.

5. For the majority of the rural population of Niger, the most important nutritional problem is insufficient calories during certain times of the year. Between the two rural populations, the nomadic-pastoralists can be presumed to be at higher risk of seasonal malnutrition. Their hardship period last one month longer than that of the agro-pastoralists. They are wholly dependent on distant markets which present unfavorable terms of trade during their hardship period while agro-pastoralists may benefit from milk availability during their hardship period. Finally, the dependence of nomadic pastoralists on one food source, milk, does not permit them to spread risk as evenly as agro-pastoralists may.

For the agro-pastoralists (comprising 72 percent of the population) the hardship season of insufficient caloric availability coincides with a resurgence in the availability of milk. Milk not only contributes high quality protein, it allows consumers to make much better metabolic use of the protein found in grains. Even if consumed in very small quantities, milk greatly enhances the protein quality of grains.

For the nomadic pastoralists (comprising 13 percent of the population) the hardship season of insufficient calorie availability coincides with insufficient protein availability.

### 7. Yearly Food Grain Requirements

The preceding food consumption analysis has implications for the calculation of yearly food grain requirements. Tables XIV and XV estimate yearly grain requirements that diverge notably from existing GON and USAID estimates. The new estimates are:

Agro-pastoralists	205 kg/person/year
Pastoralists	170 kg/person/year
Urbanites	180 kg/person/year

A weighted average of the three groups combined comes to 200 kg/person/year.

Existing estimates of yearly food grain requirements are as follows:

	<u>Kg/Person/Year</u>	
	<u>GON</u>	<u>USAID</u>
Agro-pastoralists	250	205
Pastoralists & Urbanites	200	175

By disaggregating yearly statistics that mask fluctuations of grain availability, this analysis strongly suggests that even in a good harvest year, rural populations will suffer from seasonal undernutrition. The contribution of grain calories to the diet during these hardship months is "very high" — from 80 to 90 percent. However, because the distribution of fat, protein and carbohydrate in grain is not as

Table XIV Yearly Food Grain Estimates for Nigerian Pastoralists and Urbanites on the Basis of Nutritional Requirements

Population Group (% of Total Population)	Percent Calories Milled Grains Contribute to the Diet	Various Estimates of Daily Per Capita Caloric Intake and/ or Requirements	Per Capita Daily Caloric Grain Intake or Requirement <sup>a/</sup>	20% Factor to Account for All Losses Prior to Ingestion	Kg/Person/Year Whole Grain Requirement
Pastoralist (13)					
Urban (15)	58 (USAID)	1900	1102	1322	150 <sup>b/</sup>
	Pastoralist	2000	1160	1392	155
		2100	1218	1462	165
		2200	1276	1531	170 <sup>c/</sup>
		2300	1334	1601	180
		2400	1392	1670	185
	60 (GON)	1900	1140	1368	150
	Pastoralist	2000	1200	1440	160
	Urban	2100	1260	1512	170
	60 (USAID)	2200	1320	1584	180 <sup>d/</sup>
	Urban	2300	1380	1656	185
		2400	1440	1728	190
		2500	1500	1800	200 <sup>e/</sup>

<sup>a/</sup> On the basis of FAO/HEW Food Composition Table (1972) that 1 kg. of finger millet = 3.300 Kcal.

<sup>b/</sup> The USAID estimate of a 58 percent contribution of calories from grain corresponds to the only measured consumption data known to the team. Preliminary results of a detailed household production study on a sample of 15 Wodaabe pastoral families in the Tahoua area by Dr. Cynthia White show annual per capita availability to be 126 kg/person/year. Assuming a 60 percent contribution of calories from grain, Dr. White calculated that average annual caloric intake was 1900 calories.

<sup>c/</sup> The USAID estimate of a 170 kg/person requirement for the pastoralist population corresponds to a derived per capita requirement of 2200 calories per day if grains contribute 58 percent of all calories to the diet.

<sup>d/</sup> The USAID estimate of a 180 kg/person requirement for the urban population corresponds to a derived per capita requirement of 2200 calories per day if grains contribute 60 percent of all calories to the diet.

<sup>e/</sup> The GON estimate of a 200 kg/person requirement for the urban and pastoral populations corresponds to a per capita requirement of 2500 calories per day if grains contribute 60 percent of all calories to the diet.

Table XV Yearly Food Grain Estimates for Nigerian Agro-Pastoralists on the Basis of Nutritional Requirements

Population Group (% Total Population)	Percent Calories Milled Grains Contribute to the Diet	Various Estimates of Daily Per Capita Caloric Intake and/ or Requirements	Per Capital Daily Caloric Grain Intake or Requirement a/	20% Factor to Account for All Losses Prior to Ingestion	Kg/Person/Year Whole Grain Requirement
Agro-Pastoralist (72)	70 (USAID)	1900	1330	1596	180
		2000	1400	1680	190
		2100	1470	1764	200
		2200	1540	1848	205 b/
		2300	1610	1932	215
		2400	1680	2016	225
	75 (GON)	1900	1425	1710	190
		2000	1500	1800	200
		2100	1575	1890	210
		2200	1650	1980	220
		2300	1725	2070	230
		2400	1800	2160	240
		2500	1875	2250	250 c/

a/ On the basis of FAO/WHO Food Composition Table (1972) that 1 kg. of finger millet = 3.300 Kcal.

b/ The USAID estimate of a 205 kg/person requirement corresponds to a derived per capita requirement of 2200 calories per day if grains contribute 70 percent of all calories to the diet.

c/ The GON estimate of a 250 kg/person requirement corresponds to a per capita requirement of 2500 calories per day if grains contribute 75 percent of all calories to the diet.

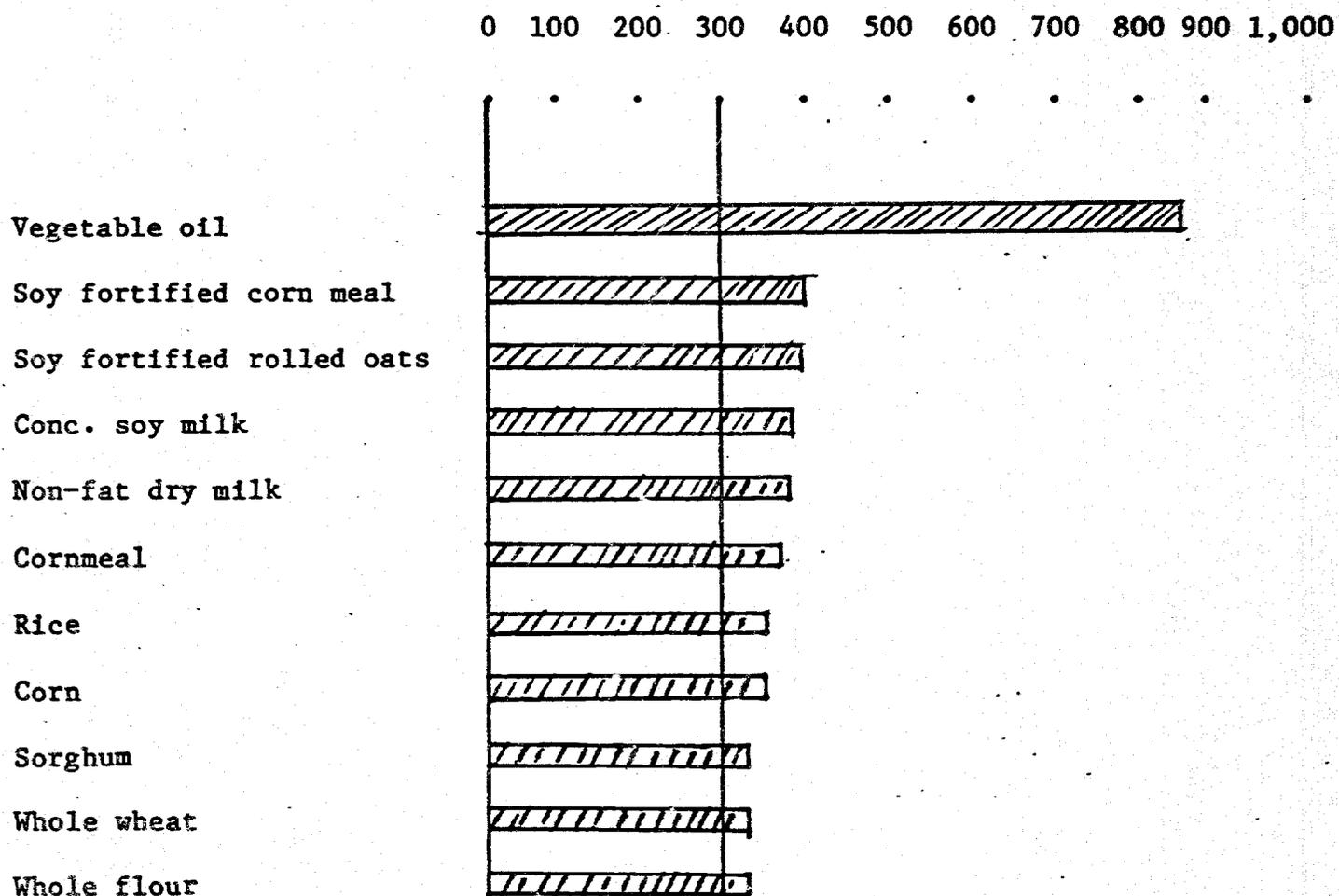
proportional as it is for milk, diet quality is low. It is important to understand that 1400 to 1900 calorie diets "very high" in grain should not be supplemented by more grain. More grain would only further skew dietary quality and further decrease the body's ability to utilize the nutrients it does absorb.

The most effective way to enhance the caloric value of cereal-based diets is to increase the availability and consumption of concentrated calorie foods, such as oil, groundnuts, and whole milk. If even some milk is available to improve the quality of the agro-pastoralist's diet during their hardship period, caloric concentration could then be achieved through increased oil consumption. Nomadic-pastoralist diets should be improved by increasing oil and legume consumption since both protein and calories are short during their hardship period. In terms of the PL 480 commodities available, vegetable oil best meets the objective of increasing dietary calorie consumption.<sup>20</sup> Table XVI demonstrates the caloric density of oil when compared to all the other available commodities.

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<sup>20</sup> Although PL 480 dry, non-fat milk is potentially available to respond to the protein problem cited, it has several drawbacks. It is difficult to store. It is difficult to reconstitute into a liquid without risking bacterial contamination. It does not enjoy as uniform a taste preference among the rural population and it lacks fat thereby contributing fewer calories by weight.

TABLE XVI

Nutrient Density of PL 480 CommoditiesCalories Per 100 Grams

### E. Summary and Recommendations

This assessment of food aid needs in Niger shows that the cereals market in Niger is in a glut and cannot absorb any more food aid. OPVN has more grain than it can store under roof. Given this major surplus but relatively constant demand, private grain markets have found a new price equilibrium that is lower than the pre-harvest market prices of recent years and much lower than OPVN's fixed retail prices. As a result of its uncompetitive position, OPVN has had to close its doors for lack of sales. The current 1983/84 harvest, which appears "normal," will simply add to OPVN's financial burden and storage problem if it guarantees cash purchases from farmers at above market prices. In summary, the GON has requested donors on several occasions to "buy back" their food aid for use in nearby countries. Niger, therefore, does not need any PL 480 cereals food aid in FY 1984 and perhaps not in FY 1985.

The major nutritional problem in the rural Nigerien diet is a seasonal caloric insufficiency which could most effectively be improved by increasing the availability of calorically dense fats and oils. Indirect food consumption estimates suggest that when caloric intake is low, grain supplies an inappropriately high percentage of the total calories. Therefore, although additional calories are still needed in rural areas on a seasonal basis, they should not be supplied in the form of additional cereals but in the form of foods high in fat or in the form of oil itself.

Nomadic pastoralists and agro-pastoralists experience weight loss due to insufficient calories during their respective hardship seasons — periods of high energy expenditure, reduced food supply and low purchasing power. Greater availability of calories from fats, a concentrated food, could alleviate this caloric deficit. Of all PL 480 commodities, vegetable oil offers the distinctive advantage of having the highest caloric density per unit. Additionally, providing calories in the form of oil would also enhance the digestibility of cereals with which it is combined.

Based on the two conclusions above — that Niger does not need more grain but that most diets are seasonally deficient in calories from fats and oils — the Food Aid Needs Assessment Team proposes a vegetable oil program under PL 480. An investigation of vegetable oil follows in Section II.

## II. Assessment of Need for Vegetable Oil Program under PL 480

### A. Production Trends

#### 1. Peanut Oil: Supply and Demand

Niger's peanut production and commercial exports fell dramatically during the past decade due to a combination of agronomic, climatic and economic factors. Of the three industrial peanut oil refineries built in the early 1970's, only Siconiger still operates, although far below capacity. The peanut sector has not yet recovered despite Government efforts to reverse the decline. Peanuts, therefore, have disappeared as a source of Government export earnings but "home-processed" peanut oil (and peanut cake) offer reasonable returns as a source of farm household income in the peanut growing area.

Two principal sources supply peanut oil in Niger, industrial refineries and local, or artisanal, processing. Over 90 percent of the supply comes from local processing.

#### a. Industrial Sector

Major peanut shelling and processing plants are located in Dosso (25,000 metric tons capacity), Tchadaoua (45,000 tons) and Malbaza (shelling only; 12,000 metric tons). These plants are currently operating at less than 10 percent of capacity. SONARA<sup>21</sup> operated and supplied peanuts for three industrial refineries in Maradi, Matemaye,

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<sup>21</sup>Until very recently SONARA was the parastatal charged with peanut marketing and exporting. SONARA has now gotten out of peanuts altogether, concentrating on cowpea exports and other enterprises.

and Magaria with a combined annual capacity of 105,000 tons of peanut oil.<sup>22</sup> These three refineries combined operated at barely one percent of capacity in 1981/82.

One of the three refineries is shut down and another is being renovated as a soft drink bottling plant. The rate of capacity utilization for the third refinery, Siconiger, fell from 28 percent in 1978/79 to 6 percent in 1981/82.

Table XVII. Siconiger's Output in Metric Tons since 1976

	<u>1975/76</u>	<u>1976/77</u>	<u>1977/78</u>	<u>1978/79</u>	<u>1979/80</u>	<u>1980/81</u>	<u>1981/82</u>	<u>1982/83</u>
1. Shelled peanuts used	14,000	6,159	7,500	12,500	2,000	1,500	2,586	1,763
2. Peanut oil refined	6,020	2,874	3,263	5,720	948	626	1,112	758

Source: Siconiger, Maradi, 1983

Siconiger cannot obtain all the peanuts it needs. Up until very recently, Siconiger purchased its supply of shelled peanuts from SONARA at 150,000 CFA francs/metric ton. However, the purchase price of 120,000 CFA /metric ton offered by SONARA was considerably below market

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<sup>22</sup> Siconiger (45,000 metric tons capacity), Société des Huileries du Niger or SHN (15,000 metric tons), and Sepani (45,000 metric tons), respectively.

prices — too low, in fact, to attract sufficient supplies.<sup>23</sup> This year (1982/83), for example, Siconiger imported 6,000 metric tons of peanuts from Nigeria for use at its plant. In other years, Siconiger has imported vegetable oils for blending with its peanut oil.

Siconiger is an unprofitable operation. It loses over one million CFA per year because low output. Sales volume does not offset high input and operating costs. There are not enough peanuts available from SONARA at an affordable price to make production profitable. Siconiger imported rapeseed for processing into rapeseed oil in 1979/80 and again 1981/82, and this too lost money.<sup>24</sup> Moreover, Siconiger's directors report that the firm presently holds a surplus of oil cake that it cannot sell because the cake is too "rich" for local livestock. A cake too rich in oil implies problems with the processing equipment or use of inappropriate equipment. Deals to export the surplus cake to Nigeria have fallen through.

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<sup>23</sup>This calculation is based on non-uniform units of measure, such as sacks per ton and tias per sack. The tia, a measure used in all markets, is equivalent to about 2.5 kg for grain but actual weight depends on the product it contains (shelled or unshelled peanuts, for example). There are about 13 sacks (about 76.92 kg) per ton and 30 tias (about 2.56 kg) per sack. At 120,000 CFA/ton, SONARA's price was equivalent to 9,230 CFA per sack, or 308 CFA per tia. Comparable market (retail) prices for shelled peanuts were reported at 14,000 CFA per sack and 467 CFA per tia. Assuming the producer received about 420 CFA per tia, his return would be 13,600 CFA per sack (or higher), versus 9,230 CFA from SONARA.

<sup>24</sup>With its new authority to purchase peanuts itself at competitive prices, Siconiger may be able to buy enough peanuts to make its operations profitable.

b. Artisanal Sector

The artisanal, or locally processed, sector accounts for more than 90 percent of Niger's supply of peanut oil. Most market women selling peanut oil do not raise their own peanuts but buy them from producers. These women do their own refining. The processing of peanut oil appears profitable only when the side product is also sold.

In Maradi, a tia of shelled peanuts (about 2.5 kg) costs 425 CFA. Ten tias of good quality shelled peanuts (25 kg) costing 4,250 CFA yield 6 liters of peanut oil with a retail value of 2,550 CFA (or 425 CFA per liter), an apparent loss of 1,700 CFA. The remaining peanut pulp is molded into small balls or peanut cakes (tourteaux d'arachide) for use as livestock feed. It was claimed that the overall profit per tia from both peanut oil and tourteaux was 150 CFA francs. This works out to a value of 168 CFA per kg of cake.

c. Estimated Total Supply

Annual peanut oil production from both the industrial and artisanal sectors totalled about 29,801 metric tons in 1982/83. This estimate is derived from the official production figure of 87,138 metric tons of peanuts less 37,469 metric tons weight of the shells (87,138 times 0.43) equals 49,669 metric tons times a peanut oil refining factor of 0.6 (49,669 MT of shelled peanuts x 0.6) equals 29,801 metric tons. This peanut oil estimate is based on two assumptions: First, the entire peanut harvest in Niger is processed into peanut oil. Second, no peanut imports are processed into peanut oil.

d. Estimated Demand

Demand data for peanut oil are even less firm than supply data. SONARA estimated total domestic consumption of peanut oil in 1980/81 at about 12,000 metric tons.

2. Vegetable Oil: Supply and Demand

The Team estimates that the supply of table oil in 1982/83 exceeds 25,250 metric tons. Of this figure, about 2,500 metric tons represents stocks and an average of 345 metric tons represents food aid. The remainder, about 22,250 metric tons, is disaggregated into domestic production (roughly 10 percent, or 2,550 MT) and unrecorded imports (roughly 90 percent, or 19,675 MT).

Nigeria supplies most of the vegetable oil found in Niger. An active cross-border trade is encouraged by different local market prices, black market exchange rates, strong demand in Niger and traditional trade patterns. Present price and supply conditions are in flux. In Nigeria, declining petroleum earnings have combined with import restrictions to disrupt supplies and force prices up. Whereas a drum of 190-200 liters of mixed vegetable oil cost 175 Naira one year ago, it now costs between 300 and 310 Naira, or about 53,000 CFA (converted at 5.75 Naira/1,000 CFA francs or approximately 174 CFA to the Naira). Adding transport and other costs, the "landed" wholesale price in Niger is around 61,500 CFA.<sup>24a</sup> Margins vary. One merchant claims he sells the drum at 74,000 CFA, a profit of around 9,000 CFA. He also claims that he was bringing in around 250 barrels per month and there are 10 to 15 other grossistes like him in the area.

<sup>24a</sup>

This is roughly comparable to the 65,000 CFA francs charged for peanut oil at Maradi or Niamey.

Merchants also reported importing oil in cans but its profitability has changed due to price increases in Nigeria. One popular item is vegetable oil from Malaysia, imported through Nigeria. It presently sells for 1,600 CFA/gallon in Niger and reportedly it costs 9,000 CFA for a carton of six gallons providing a margin of 1,000 CFA/gallon container. The price used to be around 1,300 CFA/container until recently. This increase in cost reflects the decline in the Naira's value and a concomitant price increase in the Nigerian markets and even perhaps a declining supply.

Niger's official vegetable oil (palm oil) imports are shown as follows (metric tons):

<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
1,554	2,344	2,816	847	2,709

Clandestine trade is about nine or ten times the recorded volume. The Team believes that by a ratio of roughly 13 to 10, more peanut oil than vegetable oil is available in Niger. Allowing for greater unrecorded imports of vegetable oil, the two oils may be in equal supply or total supply may even be dominated by vegetable oil.

b. Estimated Demand

Consumers in Niger at once prefer peanut oil as the traditional edible oil and will pay a premium for it but they also appreciate the option of paying less for vegetable oil. Peanut oil prices in regional markets were approximately 410-425 CFA/liter in March 1983 and up to 550-600 CFA/liter in July. March vegetable oil prices were approximately 325 CFA/liter for cottonseed oil and 315 CFA/liter for soybean oil.

Soybean oil had been imported as a food aid grant from Saudi Arabia. The highest priced brand, "Power-King" (pure, highly unsaturated, refined in Nigeria), cost 1500 CFA francs for 3 liters, or 500 CFA/liter.

Given an insufficient statistical base, estimates of national demand for vegetable oil are questionable at best. No studies investigating consumption levels on an empirical basis are known to exist. Estimates of national needs made by the Office of Foreign Trade to determine authorized import levels lack confident documentation. Siconiger estimates total national consumption is between 1,500 and 2,000 metric tons per month, of which 600 to 700 tons are consumed in Niamey.

Taking the SONARA estimates for peanut oil, the higher Siconiger estimates for vegetable oil and then disaggregating to obtain estimates for rural and urban consumption, Table XVIII indicates a large unmet demand in the rural sector.

Total urban consumption of oil is estimated at 6 percent of calories of a 2,200 calorie diet while total rural consumption of oil is estimated at only 1.6% of calories of a 2,200 calorie diet.

TABLE XVIII. Estimated Oil Consumption in Niger

Vegetable Oil SICONIGER	Total tons per year	Liters per ton	Population	Liters/ Person/ Year	% Caloric Contribution to a 2,200 Calorie diet
Aggregate	24,000	1,113.5	6,061,300	4.4	
Urban	8,400	9,353,400	909,195	10.3	4
Rural	15,600	17,370,600	5,152,015	3.4	1
Peanut Oil SONAKA					
Aggregate	12,000	1,000	6,061,300	2.1	
Urban	4,200	4,200,000	909,195	4.6	2
Rural	7,800	7,800,000	5,152,105	1.5	.6

## B. Marketing and Distribution

### 1. Market Structure

Niger's vegetable oil markets are highly fragmented. They are characterized by relatively few sellers at the wholesale level and many at the retail level, low cost entry into and exit from the market, and fluctuating supplies and prices. Main supply sources are: 1) wholesalers who buy large quantities of peanut oil from the Siconiger refinery in Maradi and who also import bulk unrefined vegetable oil from Nigeria; 2) retailers who buy peanut oil and mixed bulk vegetable oil from wholesalers; and 3) market women who process their own peanut oil, selling the oil and peanut cake in local markets.<sup>25</sup>

#### a. Wholesalers

It is nearly impossible to discern the number of participants in the vegetable oil markets, the volume handled at each level, and thus the market share of each "firm." Wholesalers in Niger are never guaranteed a smooth flow of edible oil since supplies are variable in Nigeria, the major foreign source. Their sales volume fluctuates and margins vary according to import costs. As a result of import restrictions in Niger, unofficial exchange rate fluctuations between the Naira and CFA franc, and strong demand, vegetable oil supplies are short and prices have increased since March and April 1983. Transaction costs are very expensive for wholesalers since much of their trade is illegal and entails risk. Margins can be lucrative, however, exceeding 10,000 CFA

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<sup>25</sup>Some wholesalers also retail vegetable oil, although this is an exception.

francs per 200 liter drum. Although the exact number of firms cannot be specified, there appears to be a fair amount of concentration at the wholesale level, approximately 40 merchants (10 to 15 in Zinder, 9 to 10 in Maradi, 5 or 6 in Tahoua, and 10 to 15 in Niamey) who control almost all imports from Nigeria.

b. Retailers

At the retail level, small traders tap oil from drums into one-liter or smaller-sized bottles (sometimes supplied by the customer). Retailers sell mostly on market days, doing very little oil business on other days (or earning income from other unrelated activities). As supplies are not entirely reliable, retailers tend to buy their oil wherever they can find it, usually on credit.

c. Market women

The market women seem to be entirely unaffiliated in their trade. Each buys her own supply of peanuts and has them shelled and crushed at a cost of about 450 CFA per sack. Because the purchase price of peanuts is often high — sometimes over 11,000 CFA per sack — and the yield of oil from the nuts so low, it appears that market women make very little on the sale of oil, if anything, and must recoup their costs from the sale of peanut cake. Those surveyed all reported costs and returns that, when added up and checked against other figures, showed consistent losses on peanut oil sales. Either the women were simply unwilling to reveal their true returns or artisanal peanut oil production (i.e., without the peanut cake) is unprofitable. In either case, much more needs to be learned about this part of the market, how it operates, whether any one ethnic group dominates it and why so many women sell peanut oil if they make so little profit. Their opportunity costs are undoubtedly low, but there

must be other forces dictated by market conditions that compel these women to sell peanut oil.

## 2. Government Regulation

The GON intervenes in edible oil markets by attempting to control retail prices, restrict imports and regulate peanut oil purchases from Siconiger. Marketing regulations are not uniformly enforced. It is not clear, therefore, whether they render any positive result for the market or for consumers.

### a. Price Controls

Price regulation is undertaken through periodic market surveys. Merchants discovered charging excessively high prices risk having their products seized, but this seems to occur infrequently. Retail prices are regulated rather closely in Niamey and conform with prescribed official prices. Since prices elsewhere are consistently higher than the authorized level, however, it is clear that official price controls have little influence outside of the capital city. Most of Niger's consumers, therefore, are not affected by Government attempts at price regulation.

### b. Import Licensing

By requiring import licenses, the GON attempts to regulate the supply of imported vegetable oil, notably from Nigeria. Import restrictions generally result in market distortions and rent-seeking and rent-taking behavior that often have an adverse effect on market stability. When supplies are restricted, prices go up. In Niger, however, import licensing does not appear to be a major cause of price and supply swings in the vegetable oil market.

Import requirements are determined by the difference between the perceived level of national consumption and estimates of domestic production and stocks. Licenses to import vegetable oil are authorized for up to this amount.<sup>26</sup> The Office of Foreign Trade within the Ministry of Commerce grants licenses, in principle, to anyone who applies. Licenses are valid for six months and their cost is based on the tonnage to be imported.

Ministry sources indicate that many license "shares" go unused, which implies that either part of the national consumption needs go unmet or merchants are able to circumvent the licensing requirement by importing vegetable oil anyway. The latter explanation is more plausible.

Nigerien merchants have well developed trade contacts with Nigeria and bypass currency controls by keeping large sums of Naira on hand for commercial transactions (although these days, trade may be based on the CFA franc.) While collusion is difficult to discern, the matter of rent-seeking and taking in the vegetable oil market bears much more thorough investigation.

c. Authorization to Purchase Peanut Oil from Siconiger

Until early July 1983, merchants who wished to buy peanut oil from Siconiger, the sole peanut oil refinery in operation, were required to obtain an authorization from the Office of Domestic Trade within the Ministry of Commerce. Delivery could be taken from either of Siconiger's

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<sup>26</sup>Actual figures were not provided to the Team. This report estimates import levels of close to 20,000 metric tons per year.

two outlets, in Niamey or at the refinery in Maradi. This system was criticized as showing favoritism to some merchants in prices offered and quantities guaranteed, while other merchants were sold smaller quantities than requested, or none at all. The distribution system has now been changed. As of July, any merchant is allowed to purchase any quantity of oil up to a limit of five 200-liter drums per day. It remains to be seen if this new system will work more effectively.

### C. Potential Impact of PL 480 Vegetable Oil Program

From the foregoing analysis, it is clear there is ample demand in Niger for vegetable oil. Large wholesalers are eager to sell American vegetable oil if profit margins are right.

This Section examines the potential effects of PL 480 vegetable oil on possible changes in taste preferences and consumption patterns as well as on the production and marketing of peanut oil and vegetable oil in Niger. Without firm data on consumption of peanut oil and vegetable oil or a clear breakdown of the sources of vegetable oil supply (whether domestic or imported), disincentive effects are difficult to assess.

#### 1. Impact on Consumption Patterns

Peanut oil, the traditional edible oil, remains the first choice among consumers. Peanut oil is preferred for its taste and smell. It appears that consumers will purchase some amount of peanut oil regardless of price.

based on relative supply ratios, it is logical to assume that consumers vary their consumption patterns, buying domestic peanut oil for special occasions while buying vegetable oil for everyday use. One practice becoming more common among wholesalers is to mix imported

vegetable oil from Nigeria with domestic peanut oil from Siconiger. This hybrid oil, actually, represents more of a taste change than pure vegetable oil which has been available for a long time.

In view of the strong, traditional preference for peanut oil, a supply increase in vegetable oil should not shift taste preference away from peanut oil. Rather it would begin to fill what appears to be a large unmet demand for vegetable oil.

## 2. Impact on Production of Peanut Oil and Vegetable Oil

Given that Niger's peanut crop will not increase dramatically over the short run, domestic demand will continue to be met by increased imports of both peanut oil and vegetable oil.

Increased vegetable oil imports should not have a disincentive effect on the production of domestic peanut oil. As long as the UN encourages the recovery of the peanut sector, peanut oil production should strengthen, not weaken. Until the peanut sector recovers, however, or until Siconiger can obtain a larger peanut supply, Siconiger will continue to operate below capacity. As its share of the peanut oil market is so minor already, Siconiger is unlikely to be adversely affected by more imports of vegetable oil.

As discussed earlier, artisanal peanut oil production appears to generate low profits. One possible use of the local currency proceeds from a PL 480 vegetable oil program would be to investigate more profitable means of producing artisanal peanut oil. USAID/Niger has indicated its interest in programming a portion of the PL 480 sales revenues for activities to improve research, production, distribution and processing of Niger's peanut crop.

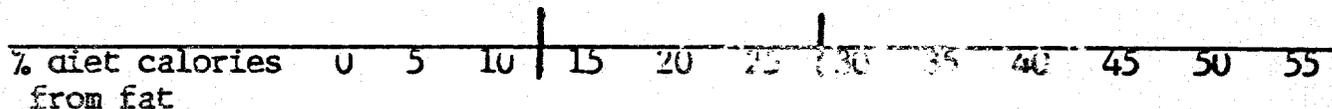
One alternative system exists in Nigeria where itinerant merchants travel the countryside crushing peanuts for local consumption. If this type of "minor crop" operation were encouraged in Niger, more peanut oil could become available throughout rural areas evenly.

Niger produces very small quantities of vegetable oil at present (cotton seed and rape seed oil). While the effects of PL 480 vegetable oil imports on domestic processing of vegetable oil cannot be predicted with certainty, it appears that increasing supplies will not cause domestic prices to fall. The characteristics of oil are such that demand appears to expand with expanding supply. As demonstrated in the continuum below, the demand for fat calories varies greatly.

Rural Nigerien Diets

Rural American Diets

Optimal  
Range



### 3. Impact on Marketing of Peanut and Vegetable Oil

Indicators point to distinctly different preference curves for different edible oils. At a given price, consumers exhibit a clear preference for peanut oil over vegetable oils. Moreover, peanut oil and other edible oils are not subject to the same price pressures.

Siconiger has difficulty selling its peanut oil even when the GON restricts vegetable oil imports. This suggests an uncompetitive price. If, as Siconiger proposes, rising imports of all edible oils will destroy its market, then more vegetable oil may contribute to that result.

Given Nigerien preference for peanut oil, however, Siconiger should be able to sell its peanut oil. An "infant industry" protection case does not seem warranted. Rather than restricting imports of substitute edible oils, Siconiger's problems can more appropriately be corrected by increasing its efficiency and reducing its production costs.

It is likely that if trade restrictions were lifted, more vegetable oil would enter Niger and vegetable oil prices would settle at some new, probably lower, equilibrium. However, PL 480 vegetable oil should be priced at cost avoiding direct or indirect consumer price subsidies.

#### D. Financial Viability of PL 480 Vegetable Oil

Initial estimates of commodity prices and shipping costs indicate that U.S. vegetable oil would be financially viable on Nigerien markets. Informal market surveys have produced no shortage of commercants willing to sell it for a reasonable profit. To date, most imports have been made through trade networks with Nigeria. Until the recent rupture of trade resulting in short supplies and high prices, few wholesalers sought other sources of supply. However, the current price and supply situation in the United States is uncertain. Is a PL 480 vegetable oil program financially viable?

Two variables will affect financial viability: 1) the price of vegetable oil in the United States and 2) the dollar-franc exchange rate. The official retail price of vegetable oil can be adjusted by GON authorities to bring the domestic price in line with world market prices.

### 1. U.S. Soybean Oil Prices

Almost all of the vegetable oil shipped under PL 480 is soybean oil. Its price, therefore, is closely correlated with soybean crop levels in the United States. According to USDA estimates, the 1983 soybean harvest will be down by about one-third from last year's level as a result of drought and acreage set aside by farmers participating in the Payment-In-Kind (PIK) program.<sup>27</sup> Futures prices for soybeans and soybean oil have doubled within the past several months. Unofficial price projections for FY 1984 PL 480 Title II vegetable oil, as of mid-September 1983, jumped 38.1 percent over the official price estimate made in mid-May 1983.<sup>28</sup>

Calculating program costs now is premature. The November 1983 crop report will give a more accurate reading of the worldwide supply and demand situation for edible oils, based on actual soybean harvest figures in the U.S. and other major exporters, such as Brazil and Argentina, as well as Malaysia, the major producer of palm oil, a close substitute for soybean oil.

### 2. The Dollar-Franc Exchange Rate

The dollar remains strong against the French franc and, hence, against the CFA franc which is pegged against the French franc at a rate of 1 FrF = 50 CFA francs. As a result of one devaluation and continued depreciation of the franc, the exchange rate which stood at approximately

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<sup>27</sup>Crop Production, USDA Statistical Reporting Service (November 10, 1983).

<sup>28</sup>The projected FY 1984 price in May 1983 stood at \$0.3150/lb or about \$694.45/MT, compared with about \$0.4350/lb or \$959.01/MT in September 1983. See Table XIX.

\$1.00 = 340 CFA francs in March 1983 stood at over 400 CFA francs by the end of August. Future rates are speculative. Despite the perception that the dollar may be over-valued against most major currencies, some financial analysts believe that this does not include the French franc and that the dollar and French franc are, in fact, in "proper" equilibrium. Thus, the exchange rate can be expected to remain at its current level at least for the short term.

### 3. Cost Estimates for PL 480 Vegetable Oil in FY 1984

Table XIX presents cost estimates. The combination of the sharp increase in vegetable oil prices in the United States and the continuing strength of the dollar against the French franc means that PL 480 vegetable oil will be all the more expensive in Niger.

If priced at cost (full value-added), PL 480 vegetable oil would considerably exceed the official retail price in (Table XIX) Scenarios C and D (which do not even take OPVN's handling and storage costs into consideration).

One obvious solution to mitigate financial loss would be to raise the domestic sales price of vegetable oil to reflect major price trends in world markets (assuming that the GON will continue its practice of setting official retail prices). The GON will probably use this official price as the basis for the value it will deposit into the FFD Account. Adjusting the official sales price of vegetable oil upward, therefore, could be one means of avoiding financial loss on the transaction. The official sales price for vegetable oil, 350 CFA/liter, was last set in February 1983 and all factors should be studied to determine whether a new price is in order.

Table XIX. Cost Estimates of PL-480 Title II Vegetable Oil in FY 1984

	<u>Scenario A</u>	<u>Scenario B</u>	<u>Scenario C</u>	
<u>Scenario D</u>				
Commodity price/MT, FAS (55 gallon drums)	\$760.00	\$694.45	\$959.01	\$826.73
Ocean Freight/MT	90.00	90.00	90.00	90.00
Inland transport/MT	<u>71.50</u>	<u>71.50</u>	<u>71.50</u>	<u>71.50</u>
Total "landed" cost/MT	\$921.50	\$855.95	\$1,120.515	\$988.23
Conversion to CFA francs/MT	313,310 CFA	303,862 CFA	448,204 CFA	395,292 CFA
Equivalent cost/liter	281	273	403	355
Official consumer price/liter	350	350	350	350
Difference/liter	69 CFA	77 CFA	-53 CFA	-5 CFA

Notes:

1. Official vegetable oil price estimate for FY 1984 for Scenario A from USDA/FAS/EC/PAD as of November 17, 1982; Scenario B from subsequent USDA price estimate of May 20, 1983; Scenario C from unofficial USDA estimates as of mid-September 1983 and Scenario D from unofficial USDA price projections as of mid-November 1983.
2. Based on actual delivery costs, July 1983.
3. Estimate derived from delivery costs of FY 1982 Title II sorghum from Cotonou, Benin to Dosso, Niger, plus 10 percent inflation factor.
4. Total landed costs do not include any duties or port storage costs.
5. Conversion rates used: Scenario A (\$1.00 = 340 CFA francs); Scenario B (\$1.00 = 340 CFA francs); Scenarios C and D (\$1.00 = 400 CFA francs).
6. Based on 1,113.5 liters of vegetable oil = 1 metric ton (MT).
7. Official GON retail price as of March 1983.
8. This difference cannot be considered a profit or loss margin as it does not include OPVN's storage and handling costs, an unknown factor.

In theory, the GON should be making periodic adjustments in its official prices anyway to reflect: 1) variations in the structure of supply and demand; 2) sources of supply (weighted by domestic production, commercial imports and food aid); 3) the premium placed on using scarce foreign exchange (weighted by foreign commodity price and exchange rate) and 4) overall handling and storage costs.

USAID/Niger would like GON agreement to deposit the full delivered value of PL 480 vegetable oil into the FFD Account. Barring a depreciation of the dollar against the franc or a drop in U.S. vegetable oil prices, however, it is clear that such a deposit formula would be financially untenable to OPVN or the GON — at least for FY 1984 and probably FY 1985. There is considerable middle ground for USAID to negotiate an intermediate deposit formula which a) meets USG guidance for Title II, Section 206 and b) generates "extra" funds for development activities above the required minimum. The ability of the GON to meet the agreed-upon deposit formula will be facilitated by the extent to which the GON raises its official retail price for vegetable oil.<sup>29</sup>

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<sup>29</sup>Section III-F presents an indicative price regime for PL 480 vegetable oil over the four year period, 1984-87, which avoids financial loss.

### III: Recommendations for a PL 480 Food for Development Program

#### A. Selection of Commodities and Import Levels

- o The Team recommends that the Food for Development Program be based on PL 480 vegetable oil.

Determining the size of the food aid program (in dollar or tonnage terms) represents a convergence of considerations: First, the absolute size of the particular food gap influences what constitutes a "reasonable" portion of food aid for the U.S. to contribute. Second, the budget of the development projects determines how much food aid is necessary to generate sufficient revenues to finance the projects. Third, the donor makes a political calculation of the volume of food aid required to leverage the recipient government into accepting and pursuing the desired food sector policy reforms.

- o The Team recommends an annual import level of 4,000 metric tons of PL 480 vegetable oil.

This volume represents roughly 20 percent of Niger's present consumption after netting out other food aid vegetable oil. At this recommended level, Niger will still be able to meet its usual marketing requirement (UNR, or normal commercial import level) for vegetable oil. Although Niger holds sufficient grain stocks to meet the country's needs through 1984, this picture could change suddenly and drastically, depending primarily on weather patterns.

- o Therefore, the Team recommends that the FFD program be structured flexibly to allow the import of up to 4,000 MT of PL 480 sorghum annually starting in FY 1985, if needed.

B. Title

- o The Team recommends that the FFD program be implemented under terms of Title II, Section 206. Title II is more appropriate than Title III for the Niger Food for Development program.

Considerations which led to this decision are discussed below.

1. The Economic and Financial Situation

Niger cannot afford to import its residual food requirements on commercial terms. The decline in uranium export earnings since 1981 has caused a serious deterioration in the country's financial situation. Terms of trade have also deteriorated by more than 30 percent because of the rapid increase in import prices and practically no change in Niger's export prices, of which the price of uranium exports is weighted as at least 70 percent of the export price index.

Recent macro-economic indicators reflect Niger's weakened financial position. The percentage contribution of uranium revenues to the national budget dropped from a high of 43 percent in 1979 to 12 percent in 1982. The national budget for FY 1983 was reduced by the GON by 13.4 percent in nominal terms and by more than 20 percent in real terms, reflecting an anticipated decrease in overall government revenues. Actual receipts for 1982 fell short of projected receipts by about 15-18 billion CFA francs. The overall fiscal deficit for the first six months of 1982/83 exceeded its target by about 55 percent. The Government hopes to reduce its overall deficit in 1983/84 by a new package of tax measures. The possibility of widening the revenue base in real terms, however, is determined more by the overall level of activity in the economy. Economic growth in 1981 slowed to about 1 percent. Real GDP has probably declined since then at an annual rate of 1 percent.

The overall balance of payments deficit in 1982 was estimated to be 29.4 billion CFA francs. It reflects an increase in external public debt servicing to 23 percent of export earnings and net capital inflows, up from 19 percent in 1982. Even with access to an IMF stand-by agreement and compensatory financing facilities, Niger is seeking debt relief through the Paris Club and the rescheduling of its public loans.

The GON, therefore, has been forced to drastically reduce investment expenditures and reassess its near term development strategies. An interim development plan for 1984-85 calls for a period of "pause and consolidation." In the face of tight budgetary resources, the GON has explicitly recognized the need for structural reforms and policy change. Among them are the stimulation of agricultural production, including cash crops which have fallen off in recent years, increased promotion of livestock and vegetable exports, and reconsideration of all subsidy policies.

## 2. Implications for a Food for Development Program

Although the severity of the current economic and financial situation has been eased to some extent by record-high external aid flows, this brief analysis suggests that the short-to-medium term priority be placed on economic and financial stabilization. This requires that the multiyear PL 480 Food for Development Program meet the following conditions.

a) The food aid program should not entail net additional outlays of foreign exchange. This condition eliminates Title I from consideration due to its dollar repayment terms and cost of commodity delivery borne by the recipient country. The appropriateness of Title III is questionable under this criterion. Even assuming dollar loan

forgiveness, the recipient country pays the cost of commodity delivery. For Niger, this would entail a foreign exchange cost it is not presently paying for other donor food aid programs.<sup>30</sup> (Although Section 304(d) authorizes the Commodity Credit Corporation to pay the cost of delivery of Title III commodities for the relatively least developed countries, such as Niger, this has never been done. USAID/Niger's interest in the Title III option would heighten considerably if there were reasonable assurances that the USG would, in fact, pay this delivery cost for Niger.)

b) The terms of a PL 480 Food for Development program should be no less concessional than food aid presently arriving from other donors. Discussion with all bilateral and multilateral food donors to Niger indicates a basic uniformity of terms: the food aid is a grant for sales or direct distribution and the donor pays the cost of delivery. Like all PL 480 food aid up to now, other donor food aid has been granted to meet emergency needs.

c) The food aid program should not engender consumer subsidies in food pricing but progressively help eliminate them. Food aid commodities should be sold at a price which is based on commodity value, delivery costs and handling and distribution charges. To do otherwise would simply add to OPVN's already sizeable debt burden or require a GON subsidy. PL 480 wheat, for example, could not be sold within the official price structure without an implicit consumer price subsidy.

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<sup>30</sup>It is understood that this criterion does not apply to local currencies generated from the sale of PL 480 commodities which may be converted to foreign exchange in conjunction with an approved Food for Development activity.

The price structure for PL 480 rice may not fully cover OPVN's operational costs and should be re-examined yearly. On the other hand, PL 480 vegetable oil, sorghum and wheat flour would be financially viable commodities and not engender price subsidies.

### 3. Characteristics of the Recipient Country

Food for Development programs under either Title III and Title II, Section 206 have identical objectives: to promote food self-reliance, food security and economic growth.<sup>31</sup>

The following characteristics should be examined to determine which of these types of PL 480 Food for Development program is more suitable for Niger:

#### a) Economic Status

i) Title III: The recipient country is a low income country, LDC (per capita income of \$795 or less in 1981).

ii) Section 206: The recipient country is a relatively least developed country, RLDC (per capita income of \$405 or less in 1981), or exhibits most of the characteristics of an RLDC.

#### b) Nature of the Food Problem

i) Title III: Country experiences lagging food and agricultural production due to structural problems calling for policy reforms and development program adjustments leading to food self-reliance and food security.

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<sup>31</sup>Food self-reliance refers to a country's ability to meet its own food needs (at acceptable levels of nutrition) through a combination of production and trade with the context of comparative advantage. Food self-reliance, therefore, is distinct from food self-sufficiency, which is defined as meeting all food needs from domestic production alone.

ii) Section 206: Country may be experiencing either 1) lagging food production due to structural problems, or 2) more erratic and severe food deficits, often closely correlated with poor weather conditions, which require chronic recourse to emergency food aid.

c) Physical Infrastructure

i) Title III: Country has minimum essential physical infrastructure permitting access to and development of main food and agricultural producing areas, as well as food delivery to deficit areas.

ii) Section 206: Country's poor physical infrastructure seriously impedes access to and realization of production potential in key agricultural areas and hampers food delivery to deficit areas.

d) Financial Capacity

i) Title III: Country is capable of financing foreign exchange costs of transporting PL 480 commodities (net of U.S. flagship freight differential) to point/port of entry.

ii) Section 206: Country is unable to finance the foreign exchange costs of transportation to point/port of entry.

e) Institutional and Technical Capacity

i) Title III: Country has minimum institutional and technical capacity to support development programs; causes of lagging food production are understood by key policy makers willing to pursue long-term efforts to improve performance.

ii) Section 206: Country has minimum to severely limited institutional and technical capacity to support policy changes or implement development programs in the absence of close collaboration with AID mission; capacity to analyze causes of poor food and agricultural is extremely weak as is the capability to plan and implement a responsive food/agricultural sector strategy.

f) Administrative Capacity

i) Title III: Country has administrative capacity and experience to negotiate and contract commodity procurement with American grain companies and arrange for delivery; country can usually field a contracting team to the U.S. or use their Embassy commercial officers in the U.S. for this purpose.

ii) Section 206: Country must use the USG as an intermediary to perform contracting and shipping functions.

All factors taken into account, USAID/Niger is willing to consider either Title II, Section 206 or Title III as appropriate for a Food for Development program for Niger. Based on the analysis of the country characteristics above and barring the unlikelihood that the USG would finance the cost of commodity delivery to Niger under Title III, however, the Team believes that a Food for Development program be implemented under the terms of Title II, Section 206.

### C. Policy Reforms

- o The Team recommends a series of food sector/grain marketing policy reforms for phased implementation over the life of the FFD program. These reforms entail: 1) improving the management and cost-effectiveness of OPVN operations; 2) modifying certain pricing policies; 3) determining the optimum level of OPVN market activities required to stabilize grain supplies and prices; 4) redefining OPVN's mandate, where appropriate; and 5) granting OPVN greater operational autonomy within the framework of its revised mandate.

Food sector analysis will point to opportunities to enlist food aid resources as leverage to reduce or remove constraints to domestic food production, marketing and consumption. The exact content of the policy reform and phasing of its implementation will depend on several factors, including: 1) the degree to which the recipient country is able to meet its own food needs (at acceptable levels of nutrition) through production and trade; 2) the nature and magnitude of the food deficit; 3) the relative importance of PL 480 food aid to all food imports (commercial and concessional); 4) the relative importance of PL 480 food aid to all other food aid received; 5) the relative size of the US bilateral assistance program; and lastly, 6) the overall tenor of US - Nigerian bilateral relations.

The approved USAID development strategy for Niger is to assist the GON to remove the broad constraints to increased productivity in agriculture and livestock and attain food self-reliance. This entails making more efficient use of available public sector resources and strengthening existing investments in key rural development institutions.

These suggested policy reforms follow directly from the Team's evaluation of the successes and shortcomings of the 1982/83 grain marketing campaign. They emphasize the management of official grain marketing operation in Niger in order to avoid the financial and storage problems encountered by OPVN this year. These reforms will require 1) divestiture by OPVN of inappropriate interventionist roles in grain marketing and 2) the continued removal of obstacles to market oriented operations.<sup>32</sup>

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<sup>32</sup> In this sense, the PL 480 program will be closely linked to other non-project assistance, such as the Niger Agricultural Sector Grant (683-0246 and 683-0247). The GON has agreed to make the following policy adjustments for the first tranche (FY 1983) of the Grant: (a) further reduction in Government subsidies to agricultural inputs; b) further freeing up by the Government of controls on the prices paid to farmers for sale of farm products; c) continued opening-up to the private sector and individual cooperatives, the ability to produce and distribute farm equipment, animal traction and other agricultural inputs; d) improvement in the management and policy of agricultural credit systems; and e) further review of the policy governing livestock and grain trade with Nigeria. Specific recommendations on these policies will follow studies conducted under the Rural Sector Development Grant and the Joint Program Assessment, a collaborative effort with the GON to look into economic policy questions.

This selection of grain marketing as the policy focus of the FFD program poses a problem: whether USAID/Niger can expect to lever changes in GON grain marketing policy through the FFD program if the principal food aid commodity is not grain but vegetable oil. While SONARA handles commercial imports of vegetable oil, OPVN still handles all donor food aid, including vegetable oil. Therefore, it should be possible to establish this linkage with OPVN and make use of vegetable oil for policy leverage.

This report proposes the following food sector/grain marketing reforms for phased implementation over the life of the multi-year Food for Development program. These reforms could take the form of annually incremental self-help measures or other binding agreement within the PL 480 Transfer Authorization.

1. Immediate-term

1) The OPVN should take the following supply and demand factors into consideration when setting official (OPVN) producer and consumer prices: a) the year-long open market price data on various grains as collected and submitted by department-level OPVN chefs d'agence; b) crop production estimates and updates of the MDK's Service Statistique; and c) the expected grain harvest levels in northern Nigeria, official and market price data, and official and unofficial Naira - CFA franc exchange rates. The OPVN should also consult field agents throughout process of determining official price levels.

2) In order not to exceed grain purchase (campagne d'achat) targets and to avoid costly surplus storage, OPVN should improve its accounting and reporting systems, maintain close contact with its field agents on volume purchased and cut off purchases immediately once the purchase target is reached.

Discussion: These first two recommendations are not being followed by the OPVN at present time. Better management of Government resources and data available to OPVN plus official acknowledgement of the potential influence of northern Nigeria's agricultural sector would greatly facilitate OPVN operations and decision-making. In some instances, having an accurate idea of how much grain has been purchased, for example, management can be improved simply by better communication between field staff and headquarters.

3) In order to give priority of crop purchase to farmer cooperatives (through the UNCC), the OPVN should limit grain purchases to sales from cooperatives during the first three weeks of the buying campaign, after which it should open up for crop purchases from anyone.

Discussion: Cooperatives should be given first opportunity to sell their crops to OPVN because it is GON policy to strengthen farmer cooperatives. Due to a late harvest in 1982/83 and initially slow sales from cooperatives, the buying campaign was opened to grain dealers. As a result, OPVN purchased the bulk of its first 40,000 tons from dealers. Had there been a lower grain purchase target this past year obliging OPVN to cut off purchases at an earlier date, cooperatives would have been effectively cut out.

## 2. Medium-term:

4) The MDR should carry out a comprehensive study of sorghum and millet production and marketing costs, differentiated by region, for OPVN use in determining remunerative producer price levels.

5) OPVN should carry out a comprehensive study of its transport and storage costs in region by region order to a) realize cost savings where possible, and b) more accurately set its official consumer prices at levels which recoup operational costs.

6) OPVN should consider setting an official producer and consumer price schedule differentiated by regions and seasons, as was the case in Niger until 1972/73.

Discussion: There are potential cost-savings for OPVN in offering differentiated producer prices which recognize the economic cost of production in various regions of the country and remunerate farmers accordingly. This measure should help enhance farm-level production decisions to plant surplus grains.

7) OPVN should develop a formula or model to determine the optimum level of OPVN market intervention to stabilize prices and supply in various situations.

Discussion: Depending on the actual situation, the level of OPVN market intervention required to stabilize grain supplies and prices may be relatively small, a minor portion of all grain marketed. Better knowledge of the variables determining market supplies and prices would help OPVN avoid purchasing too little grain or too much. Variables for consideration by this formula or model include: a) rainfall patterns and

harvest estimates, by producing region; b) crop mix (food crops vs. cash crops); c) actual harvest levels, by region; d) post-harvest estimated levels of farmer-held grain reserves; e) market price series, by region; f) estimates of marketable grain surpluses in Niger; g) estimates of marketable grain surpluses in neighboring countries (including parity price levels); h) volume of GON-owned and managed reserves; i) estimates of unrecorded (unofficial) grain imports and exports; j) officially recorded grain imports (food aid and commercial term) and grain exports (commercial), as well as date of delivery to Niger; and k) actual measurements of per capita grain consumption, by season, for pastoralist, agro-pastoralist and urban population subgroups.

8) The GON should carefully redefine the various functions of OPVN, discarding those incompatible functions or those which OPVN cannot perform on a sound economic and financial basis (unless explicitly acknowledged and supported by central government revenues).

Discussion: The rationale for this recommendation is described in Part III. Clearly defined objectives and responsibilities for OPVN and financial responsibilities of the GON will ensure greater operational efficiency and cost savings.

One model for consideration to redefine the functions of OPVN is the program-contract (contract-plan) now used in Senegal between the Government and its regional development agencies (sociétés du développement rural). The program-contract specifies the medium term objectives to be met by each Agency as well as the respective financial obligations of the GOS and the Agency. Each program-contract contains an

investment plan for the Agency but allows greater financial and operational autonomy to reach the desired goals. The program-contracts signed to date in Senegal have generally reduced the scope of the Agency in question, its budget and staffing, while strengthening its main extension and other productive activities. The remaining staff are being retrained as appropriate. The practical result of similar changes for the OPVN would be a loosening of bureaucratic controls and presumably greater operational efficiency.

### 3. Long-term

9) Once OPVN's role is redefined, the GON should grant OPVN the authority to set producer and consumer prices itself, within the policy framework of its revised mandate.

Discussion: At present, official producer and consumer grain prices are set by an interministerial National Cereals Committee after consultation with OPVN management. These prices are fixed to reflect GON social welfare objectives and do not cover OPVN's handling and storage costs. (As discussed previously, not even OPVN has a precise idea of its operational costs. A precondition for this reform is a careful study of OPVN's operational costs region by region (Recommendation 5) to provide the basis for setting grain prices.) This recommendation follows logically from Recommendations 4, 5 and 6. Once OPVN has a better grasp of grain production, marketing and other operational costs, it should be authorized to set its own price levels within its redefined mandate.

This is only an indicative list of the type of policy reforms which, if fully carried out, would have far-reaching consequences for OPVN and Niger's food self-reliance and food security. Achieving these policy reforms will require a considerable commitment of resources in terms of time and personnel. A Food for Development proposal linking these reforms should be attempted only when the GON and USAID are fully committed to a long-term policy dialogue.

D. Projects for PL 480 Local Currency Financing

Proceeds from the sale of PL 480 commodities will be channelled back into food and agricultural sector activities.

- o The Team recommends that the development projects selected for funding should relate as closely as possible to the proposed policy reforms above or to activities which ensure steady growth of and improved seasonal access to the key foods such as oil, whole milk, groundnuts, other oil seeds, and their by-products.

USAID/Niger might consider the following types of projects:

- 1) Small and large ruminant production for small-holder sedentary farmers who do not own livestock..
- 2) Dry-season forage production on fallow fields.
- 3) Research on or extension of productive varieties of several oil seeds.
- 4) Improvements in medium-scale oil-seed processing.
- 5) Improved marketing of oil seeds, especially toward a pastoralist consumer.
- 6) Development of the northern towns that often trade with pastoralists, so that they can provide more goods and services to this population.

The ultimate mix of development projects will have to be mutually agreed upon by the GON and USAID.

- o The Team recommends that the budget of the FFD program be structured so that all activities will be fully financed from proceeds from the sale of PL 480 vegetable oil, but with flexibility to expand and/or accelerate the scope of activities if additional funds are available from the sale of PL 480 sorghum.

E. Administrative and Managerial Arrangements

- o The Team recommends that administrative and managerial arrangements for the Food for Development program be set up along the following lines:

1. Government of Niger

- o The Team recommends that OPVN be responsible for receiving, storing, distributing and marketing the PL 480 vegetable oil through normal commercial channels, assisted by SONARA, if necessary.

As long as vegetable oil remains to be sold, OPVN will submit a report to USAID/Niger each quarter providing data on arrivals (receipt of vegetable oil under the FFD program); distribution and sales; damaged stocks; and ending stocks. OPVN shall submit revenues from the sale of PL 480 vegetable oil equivalent to the cost of the USG of commodity purchase and delivery (a set value to be determined jointly each year) to a financial institution in Niamey for deposit into the PL 480 Food for Development account. The financial institution will be responsible for the management of the Food and Development account, depositing revenues received and disbursing revenues as authorized to finance implementation of the agreed projects, as well as submitting quarterly financial reports.

The Ministry of Rural Development will be responsible for overall FFD program management and implementation. The appropriate officer of the MDR will ensure that FFD project implementation follows the internal operating procedures of the MDR. Project managers will provide logistical, technical and administrative support between field implementation and Niamey. Field supervisors will direct the job foremen responsible in each project.

## 2. USAID/Niger

- o The Team recommends that USAID/Niger designate a direct-hire staffer as FFD Program Coordinator, with supporting staff as necessary, to assume responsibilities for monitoring, coordinating and evaluating the FFD program.

The Program Coordinator will be the initial point of contact for the GON for all matters concerning the FFD program. USAID staff will be assigned responsibilities to monitor each respective FFD project and offer technical advice to GON project managers where necessary.

The Program Coordinator will be responsible for monitoring the use and management of the Food for Development account, overseeing and facilitating implementation of the program from the USAID perspective, recommending possible program changes, coordinating USAID FFD project monitors, and responding to periodic PL 480 and Food for Development inquiries from AID/W. Another key duty will be working with GON counterparts on the annual evaluation reports on progress achieved in individual project implementation and an accounting of the use of PL 480 generated revenues, advising on report format and content, if necessary.

The Coordinator will be the principal person examining the GON Evaluation Report and primary author of the USAID assessment of the GON Evaluation Report, both of which will be submitted to Washington for USG inter-agency review.

F. The Food for Development Account

The Team recommends that financial and other procedures for the FFD Account be implemented along the following lines:

The PL 480 Food for Development account (the Account) will be set up in an appropriate financial institution in Niamey and administered by the Ministry of Rural Development (MDR). OPVN will be the GON institution responsible for deposit of PL 480 sales proceeds into the Account.

1. Deposits Formula

- o The Team recommends that OPVN deposit into the PL 480 account the full CFA equivalent of the "landed" commodity value — commodity plus delivery costs.<sup>33</sup>

Further, the Team recommends that the consumer sales price in Niger incorporate OPVN's domestic handling and distribution charges. (See Table VII.1. which illustrates these points based on a hypothetical price scenario.

Item 4 represents the "landed" value proposed for deposit by the GON into the Account.)

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<sup>33</sup> This represents the ideal deposits formula for the reasons discussed. It is recognized, however, that rising vegetable oil prices in the U.S. and a continuing unfavorable exchange rate (to Niger) may make PL 480 vegetable oil too expensive in local terms and such a deposits formula prohibitive. In that case, an intermediate deposits formula would have to be developed, somewhere above the minimum deposit requirement but below full cost.

USG guidance for Title II, Section 206 programs requires that the funds to be made available for development purposes be no less than the local currency equivalent of the commodity value in dollars prior to export from the United States.<sup>34</sup> The USG will supply 4,000 tons of the PL 480 vegetable oil annually and pay ocean freight and inland delivery to Dosso, the designated point of entry in Niger.

There are three distinct benefits to this financial arrangement. The first is that the sales price recoups the full cost of the program borne by the United States and makes it all available for development activities, thereby augmenting the FFD program budget by another 20 to 25 percent. Second, OPVN will not incur any financial losses on its PL 480 transactions, an important consideration in view of OPVN's large debts remaining from the 1982/83 buying campaign. Third, the price paid by the Nigerien consumer represents the true value of the commodity in an economic sense and thereby does not pass along any indirect price subsidies which could cause a disincentive to domestic production and marketing of vegetable oil or peanut oil and other substitutes. This last point is especially important. It is essential that potential price distortions associated with a new food aid program be minimized from the outset.

The sales price of PL 480 vegetable oil will be adjusted annually to reflect shifts in commodity cost, delivery cost, domestic handling and exchange rate fluctuations.

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<sup>34</sup>State 170920 of June 29, 1981.

Table XX. Hypothetical Price Scenario for PL 480 Vegetable Oil

	<u>FY 1984</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>
A. U.S. Government Costs				
1. Price of PL 480 vegetable oil/MT <sup>a</sup>	\$694.45	\$727.52	\$771.01	\$815.70
2. Cost of ocean freight to Cotonou or Lome/MT	90.00	99.00	108.90	119.79
3. Cost of inland delivery/MT Cotonou/Lome to Dosso <sup>b</sup>	71.50	78.65	86.52	95.17
4. Subtotal/MT (for deposit into FFD Account)	\$855.95	\$905.17	\$967.03	\$1,030.66
B. Government of Niger Costs				
5. Conversion at \$1.00 = 400 CFA francs	345,380 CFA	362,068 CFA	386,812 CFA	412,263 CFA
6. Conversion in cost/liter at (1 MT vegetable oil = 1,113.5 liters vegetable oil)	307.5	325.2	347.4	370.2
7. OPVN's costs of handling and distribution/liter <sup>c</sup>	60.0	66.0	72.6	76.8
8. Subtotal (economic price of PL 480 vegetable oil/liter)	367.5	391.2	420.0	447.0
9. Official consumer price for vegetable oil/liter <sup>d</sup>	375.0	400.0	425.0	450.0
10. GON margin (9-8)/liter	7.5	8.8	5.0	3.0

<sup>a</sup>Prices of PL 480 vegetable oil are based on USDA estimates (USDA/FAS/EC/PAD) of May 20, 1983.

<sup>b</sup>Delivery costs (ocean freight and inland delivery) are derived from actual costs in 1983 times an annual inflation factor of 10 percent

<sup>c</sup>OPVN's handling costs are hypothetical.

<sup>d</sup>Official consumer price is hypothetical.

## 2. Schedule of Deposits

OPVN shall deposit the CFA franc equivalent of the commodity plus delivery costs into the FFD Account no later than 90 days after it sells the vegetable oil to wholesalers. Deposits shall be made into the FFD Account as soon as possible after the sale of the commodities but not later than six months after the last delivery of vegetable oil in the given PL 480 fiscal year under the agreement.

## 3. Disbursement from the Account

Each activity to be financed by the FFD program will have its own life of program indicative budget. The appropriate officer of the MDR will be responsible for receiving and reviewing the budget requests from the individual GON project managers. The MDR will submit to USAID/Niger annual and quarterly project budget requests with recommendations for approval. A Project Implementation Letter will formally authorize each quarterly transfer of funds from the FFD Account to the separate sub-account established for each activity (upon verification of availability of funds).

Alternatively, a joint GON/USAID Food for Development program Management Committee shall be established for the purpose of reviewing and approving budget requests from the individual GON project managers and authorizing quarterly transfer of funds from the FFD Account (upon verification of availability of funds) to the separate sub-account established for each authorized activity. Membership of the FFD Management Committee shall be comprised of representatives of the MDR (chairman), Ministry of Finance (secretary), Ministry of Plan and the USAID Program Coordinator. If necessary, a small FFD secretariat may be established to aid the Management Committee in day-to-day operations of

the program, such as preparation of periodic and special reports, coordination of quarterly workplans and budget requests, drafting the annual evaluation reports, bringing to the attention of the Management Committee any problems affecting program execution, and carrying out other duties as delegated.

#### 4. Management of Individual Project Sub-Accounts

The project sub-accounts will be managed by the respective GON project manager and monitored by the respective USAID project monitor. The MDR Department of Administrative and Financial Affairs and USAID/Niger controller may provide accounts management advice as required. Project implementation and budget issues which cannot be resolved at the working level will be referred to the Minister of Rural Development and USAID Director for resolution. The (financial institution) will submit to the GON and USAID a quarterly statement on the funds deposited into the FFD Account and disbursed to the project sub-accounts. The FFD Program Coordinator will be the principal person from USAID responsible for monitoring the FDD account and for bringing management concerns, including any recommendations, to the attention of USAID/Niamey.

#### G. Annual Evaluations

The Title II, Section 206 Food for Development agreement requires an annual Evaluation Report, to be written by the recipient government with assistance from the USAID. The GON retains responsibility for the Evaluation Report, including recommendations for changes in future programming of food and development activities.

The following is a generalized scope of work for the annual Evaluation Report which addresses five related issues, plus recommendations, as follows:

For the GON:

- a) Policy issues. Evaluate the contribution of the FFD program to the GON's economic, agricultural and food policy objectives, including progress on self-help measures to date.
- b) Commodity issues. Evaluate the continued acceptability of PL 480 vegetable oil and its impact on domestic production and marketing of substitute products as well as the regularity of its availability to pastoralists and agro-pastoralists during their respective hardship seasons.
- c) FFD Account. Discuss GON procedures for management of the Account and availability of funds to implement the FFD program. Provide an accounting of funds generated by sales, funds disbursed, and end-of-year balances.
- d) Management issues. Examine the respective roles and degree of support of cooperating GON agencies in fulfilling the terms of the agreement at the program and project levels and the adequacy of monitoring by USAID.
- e) Program implementation. Evaluate the implementation status and impact of specific projects and compare achievements to original benchmarks, analyzing reasons for any delays.
- f) Recommendations. Present recommendations to increase the effectiveness of the FFD program.

For USAID/Niger:

- 1) Assess the overall adequacy of the GON Evaluation Report and its coverage of the main issues above, highlighting major areas of agreement or differences.
- 2) Assess the feasibility of any program changes recommended by the GON, including the timetable and assignment of responsibility for each action.
- 3) .Submit own recommendations for changes in program or project objectives, project mix, type and volume of commodities, accounting and management, where necessary.

both documents, the GON's Evaluation Report and the USAID's assessment, will be reviewed in Washington.

1. Calendar of Events

The GON's first Evaluation Report is due in USAID/Niger fourteen months after the beginning of implementation of the FFD program. The USAID will submit the Evaluation Report, along with its review and assessment, to AID/W within one month after receipt of the report from the GON.

Six months prior to the due date, USAID/Niger should discuss the schedule and content of the evaluation with the GON. Generally, the Evaluation Report should cover the topics outlined in the scope of work. The section on recommendations should indicate what government agency would be required to implement each recommendation. Decisions should be made at this time on the degree of participation by USAID staff and outside technicians.

The Evaluation Report and USAID assessment will be reviewed in Washington by the Niger FFD Project Committee according to Title II,

Section 206 guidelines. The USG inter-agency Food Aid Subcommittee of the Development Coordination Committee has ultimate decision authority on continuation and changes in the program.

USAID/Niger may want to send a representative to Washington to present its review and assessment of the Evaluation Report to the Africa Bureau as well as the country Working Group. GON staff may participate in this presentation, if desired.

#### IV. Guidance for the Food For Development PID

Terms of Reference: Title II, Section 206 Food For Development Program  
PID Design

##### A. Analysis of Food and Agricultural Sector

1. Analyze present food and agricultural sector and its relationship to the current economic and financial situation in Niger and the GON's development strategy

a. in the context of Niger's economic resources, production potential, employment structure and sources of national income;

b. in the context of the GON budget structure, international trade, balance of payments, external debt and debt servicing;

c. in the context of GON agricultural and rural development policies approved by the Zinder Conference (November 1982) concerning the roles of 1) agricultural research, 2) extension, 3) cooperatives, 4) pricing, 5) marketing, 6) food security reserves and 7) food aid; and

d. in the context of variety and quantity of grain and all non grain foods available to the rural population during various seasons of the year;

e. in the context of the USAID development strategy for Niger (approved UDSS) and other donor assistance in strengthening the food and agricultural sector.

2. On the basis of above analysis, identify and recommend (a) food and agricultural policy reforms and (b) discrete project interventions which would enhance Niger's food security and contribute to the GON's overall development objectives.

B. PL 480 Commodities

1. Analyze the nature of the food problem by region in order to justify the need for PL-480 food assistance.

2. Describe the demand and supply pattern for the major food commodities by region.

a. Analyze the nature of the undernutrition and malnutrition problems and identify its structural causes. (Refer to Africa bureau Nutrition Guidelines for Agriculture and Rural Development)

b. Develop supply and demand data for the PL 480 commodity(ies) to be imported as well as any substitute crops grown in Niger by region.

3. On the basis of the above analysis, select an appropriate PL 480 commodity or mix of commodities for the Niger Food for Development program.

a. Determine the quantity of PL-480 commodities required by region with consideration to optional food consumption pattern; domestic production of grains, minor crops and milk; commercial imports/UMKs; and other food aid).

b. Indicate why other commodities are not appropriate.

4. Describe any possible problems foreseen by importing the selected PL-480 commodity and how they are to be resolved.

a. Determine whether the current or planned commodity price structure allows the GUN to meet its required deposit of the CFA franc equivalent of the PL-480 commodity value into the FFD account.

b. Verify that provision of PL-480 commodities will meet legislative requirements of i) avoidance of production and marketing

disincentives; ii) adequate storage facilities in Niger; and iii) usual market requirements (UMRs).

C. Food for Development Program

1. based on the legislation for Title II Section 206, current USG guidance for Section 206 programs, the GDSS and ABS for Niger as well as other Agency food aid policies, justify Niger's eligibility under Section 206 and indicate how a Section 206 program addresses the causes of the need for food aid and how it furthers the development of the country's food and agricultural sector.

2. On the basis of the analysis of the Food and Agricultural Sector Part A, propose a) possible policy reforms and GON development program adjustments; and b) discrete project interventions which will improve food security and for which a Section 206 program can have a measurable impact.

3. Example of policy reforms and projects are those which would:

a. stimulate additional GON activities aimed at increasing per capita food consumption, improve storage and distribution networks, and support GON initiatives to increase private sector participation in the agricultural sector.

b. be integrated with the USAID development program for Niger.

c. correspond to Niger's physical infrastructure and financial, institutional and technical capacity to implement a Title II, Section 206 Food for Development Program.

3. Develop a multi-year Food for Development program budget denominated in both dollars and CFA francs to finance the selected

activities, including supplementary Development Assistance (D.A.) funding, where feasible.

4. For each project activity above:

- a. describe the background and purpose, implementation plan, inputs, outputs (including progress benchmarks), financial plan and beneficiaries.
- b. indicate the preliminary economic viability of the proposed activity (see Africa Bureau Economic Analysis of Agricultural and Rural Development Projects: an Informal Guide).
- c. identify the respective GON ministry or agency responsible for implementation, its capabilities and limitations.
- d. identify the respective USAID project monitor or monitoring office.

5. Describe FFD program management procedures including:

- a. the composition and responsibilities of a GON/USAID management committee or some other executive decision-making mechanism to resolve program policy, budget or project implementation issues.
- b. a system for ongoing program monitoring and a schedule for annual evaluation.

The PID Design team should be comprised of the USAID program economist, an agricultural economist, nutrition analyst, PL-480 food aid monitor and/or KFRPU (Abidjan) and design officer. Financial management guidance is also essential.

Annex A. Persons Consulted in NigerGovernment of Niger

Mr. Agamou Souna, Director-General of l'Office des Produits Vivriers du Niger (OPVN)  
 Mr. Rene Wright, Director of Operations, OPVN  
 Mr. Hans Raubec, Technical advisor to OPVN for security stocks  
 Mr. Mahmane Gusmane, branch Chief, OPVN, for the department of Zinder  
 Mr. Mahmane Maidagi, Assistant branch Chief, OPVN, Zinder  
 Mr. Ibrahim Mayana, OPVN, Magaria  
 Mr. Mahmane Garba, branch Chief, OPVN, for the department of Maradi  
 Mr. Karl-Heinz Eyrich, Technical advisor to OPVN, Maradi  
 Mr. Iue waqibi, branch Chief, OPVN, for the department of Tahoua  
 Mr. Bomberi, representative of l'Union Nigerienne de Credit et de Cooperation (UNCC) for the department of Zinder  
 Mr. Abdou Galagima, UNCC Representative for the department of Maradi  
 Mr. Assoumane Baoua, Director of Studies and Programs, Ministry of Rural Development  
 Mr. Ilo Katche, Chief of the Agricultural Statistics Section, Ministry of Rural Development  
 Mr. Chaffali Lawal, Director of Evaluations, Ministry of Plan  
 Mr. Louis Segal, Ministry of Plan  
 Mr. Ali Alidou, Director-General, CUPRO-Niger  
 Mr. Moussa Adamou, Commercial Director, SIPRIC  
 Mr. Ali Sabo, Director-General, SONARA  
 Ms. Brigitte Dia, SONARA  
 Mr. Oumarou Kalla, Chief of Production, SOTRAMEL  
 Mr. Georges Poizat, Braniger  
 Mr. Abdoulaye Sabbou Maiga, Ministry of Public Health, Director of Health Education, Sanitation and Nutrition, Niamey, Niger  
 Mrs. Boulama Monique, Ministry of Public Health, Nutrition Section, Niamey, Niger  
 Mr. Garba Ousseini, Director of School of Public Health, Niamey, Niger  
 Mrs. Ramatou Housseini, Director PMI, Direction des Affaires Sociales et de la PMI, Niamey, Niger

USAID and American Embassy

Mr. William Casey, Ambassador of the United States  
 Mr. Michael Southwick, Deputy Chief of Mission  
 Mr. Irving Rosenthal, Director, USAID/Niger  
 Mr. Myron Golden, USAID Program Office  
 Mr. Randall Casey, USAID Program Office  
 Mr. Kurt Ton, USAID Economist  
 Mr. Cam Pippett, USAID Design Office