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AN ASSESSMENT OF THE SUPPLY AND MARKETING SITUATION
FOR AGRICULTURAL COMMODITIES IN THE MANDARA MOUNTAINS
INTEGRATED DEVELOPMENT PROJECT REGION

By

John Holtzman
Specialist

Michael Weber
Assistant Professor

Department of
Agricultural Economics

MICHIGAN STATE
UNIVERSITY

East Lansing

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FOREWORD

Margui-Wandala Department and Meri Arrondissement in Northern Cameroon constitute the area to be covered by a proposed Mandara Mountain Integrated Rural Development Project. In February, 1980, a team of researchers from Michigan State University initiated a series of studies relating to farming systems, livestock production, land use and human nutrition which were to provide data for the design and eventual evaluation of the project. During the months of April and May, 1980, MSU researchers, including John Holtzman, carried out an extensive survey of farm households randomly selected from throughout these two administrative units. That survey included information on agricultural production and marketing in the proposed project area.

Following the extensive survey John Holtzman continued to gather data on agricultural markets and the commodities which flow through them. During the month of August, 1980 Michael Weber, who has had extensive experience studying agricultural markets in developing countries spent two weeks in Margui-Wandala/Meri working with John in analyzing data gathered to date. This report, the sixth in a series of publications pertaining to the Mandara Mountains, details their findings.

Tom Zalla
Research Coordinator
Mandara Mountain Project

I. SIZE, LOCATION, SPACING AND IMPORTANCE OF MARKETS

A. Population Size and Distribution

The Department of Margui-Wandala has an estimated 1980 population of 496,310. Given the current rates of birth, death and permanent outmigration, this population is estimated to be growing at the rate of 2.5 percent per year. At this growth rate, the total population of the Department will reach an estimated size of 635,319 in 10 years and 813,262 in 20 years. This represents an aggregate population increase of 28% in 10 years and some 63% in twenty years. Such growth rates are obviously subject to significant changes depending upon the ability of the region to expand employment opportunities and the production of basic needs of food, clothing, shelter, etc. The potential for employment outside the region will also influence the rate of permanent out-migration.

Notwithstanding the fact that the growth rate of the population of the Margui-Wandala Department could change, it is virtually certain that significant increases in population will occur and to just maintain existing levels of living will require significant increases in food production and/or increases in income generating opportunities.

The population of the Department is primarily rural, although there are some four rural towns which are taking on the characteristics of urban areas, and serve as centers for important economic and social services for the rural population. We have labeled these as important regional market towns. Characteristics of these four larger rural towns are shown in Table 1. Mokolo is clearly the most important urban place in the Department with Mora, Koza and Mémé as other towns in which the urban population ranges from 3000 to 6000. The primary market influence area of Mokolo is significantly larger than that of the other three market towns shown in the Table:

TABLE 1. Estimated Important Regional Market Town Population
Margui-Wandala Department

Major Rural Town	Estimated Town Population	Estimated Population Within Primary Area of Market Influence
Mokolo	8000	115,850 ¹
Mora	6000	43,095 ²
Koza	5000	70,000 ³
Mémé	4000	16,992 ⁴

¹Includes the 1980 estimated population of the Cantons of Mokolo and Matakam-Sud.

²Includes the 1980 estimated population of the Cantons of Mora, Podoko Sud, Centre and Nord, Mora-Massif, Kourgui, and Warba.

³Includes the 1980 estimated population of the Cantons of Koza, Mozogo, Moskota and Gaboua.

⁴Includes the 1980 estimated population of the Cantons of Mémé, Palbara, Mada, Makilingai, and Wada.

There is another category of smaller rural towns which vary in size from 1000 to 3000. These can be generally characterized as being rural although selected urban infrastructures and services are available in them. There are some 10 to 15 of these towns and most have more localized, secondary market sheds which draw the town and immediate surrounding population.

Finally there are a very large number of rural villages in the Department which vary in their settlement pattern according to ethnic and religious characteristics. In the moslem areas of the plains the villages are nucliated, and in the non-moslem mountain and plateau areas there is generally a dispersed population settlement pattern.

B. Key Factors Affecting Market Importance

An important factor affecting the size of a market is the population of the town where the market is held and the surrounding area. Mokolo, Mora, Koza and Mémé have relatively large populations and hence considerable urban demand. Moreover, the population density in the Mountains and lowlands around Mokolo, Koza and, in particular,

Mora are quite high, contributing further to the level of demand and marketed produce.

A second factor influencing the location and size of markets is the juxtaposition of ecologically distinct zones. One would predict, for example, that Koza would be an important market, since it is situated in the Plains at the foot of the mountain chain north of Mokolo. The Mafa of the Mountains descend to this plains market to buy grain, onions and fruit from Mandara and Kanouri traders and to sell the peanuts, pois vouandzou, small stock, and spices and condiments they produce in the Mountains. The two regions complement each other from the standpoint of production and exchange, and Koza is ideally located to capture this complementarity.

Mora is very similar in that it is located at the base of the Mora and Podoko massifs, where peanuts, cowpeas, pois vouandzou, and other legumes are cultivated. Grain and onions produced in the Plains are exchanged for these commodities. These interactions between farmers in the Mountains around Mora and Tokonbéré and the Plains are described in greater detail by Antoinette Hallaire in a monograph entitled "Marchés et Commerce au Nord des Monts Mandara (1972)." Mokolo, situated at the foot of the Mountains on the northern edge of the Plateau that sweeps southward toward the Benoue, is also a natural point of exchange for products of the two regions.

A third and very important factor affecting market location and importance is the proximity of heavily-populated wealthy Nigeria. Markets such as Kerawa, Banki and Boukoula have acquired an additional importance because of their border location. Cloth, shoes, batteries, radios, flashlights, pots and pans, cooking utensils and many other manufactured goods are available in abundance at these markets, as are grain and processed agricultural products like sugar, canned fish

sweets, biscuits and vegetable oil. The price differentials between Nigeria and northern Cameroun strongly influence commodity flows. Groundnuts and cattle typically flow out of Cameroun and into Nigeria in exchange for grain and consumer goods. This past year has been atypical in that few groundnuts have left Cameroun. The 1979-80 harvest was poor. Consequently, there was little surplus available for export.

C. Classification of Markets

The marketing system in the project area is diverse and regionally differentiated. Despite this diversity, it is possible to distinguish between the five following types of markets:

1. Large regional markets having multi-commodity market sheds extending far beyond the immediately surrounding areas. These markets are located in towns with relatively large populations. Bulking and de-bulking of a wide range of commodities take place at these markets.
2. Localized, secondary markets serving the rural population in the immediately surrounding area. These are generally located in the smaller rural towns of 1 to 3 thousand in population. Most buyers and sellers come to these markets on foot or by donkey or bicycle. These markets attract buyers and sellers of special commodities from substantial distances while they also serve a local market shed of limited size. It is important to note that these secondary markets vary widely in size and importance.
3. Tertiary village markets that serve small populations mainly as social gathering points. We did not focus our research efforts on these markets.
4. Markets bordering on Nigeria that have assumed greater importance since the early 1970's with the increased

Nigerian income and demand for agricultural produce and the increased capability of Nigeria to supply Cameroun with consumer goods.

5. Cattle markets that are held weekly in conjunction with foodstuff markets. These are discussed in the report on livestock marketing.

In the following pages we have classified the principal foodstuff markets in the project area. The day the market meets and the major commodities that are bought and sold are noted for each market. In addition, each market can be seen on either Maps One or Two. (The first map shows the large regional markets as well as the principal border markets. The second map shows the secondary markets in the project area. The classification of foodstuff markets in the area is based upon direct observation of the numbers of buyers and sellers, the numbers and types of vehicles, and the volume of commodities offered for sale and flowing in and out of the markets. In addition, market masters and traders were asked about seasonal variation in market activity and commodity flows.

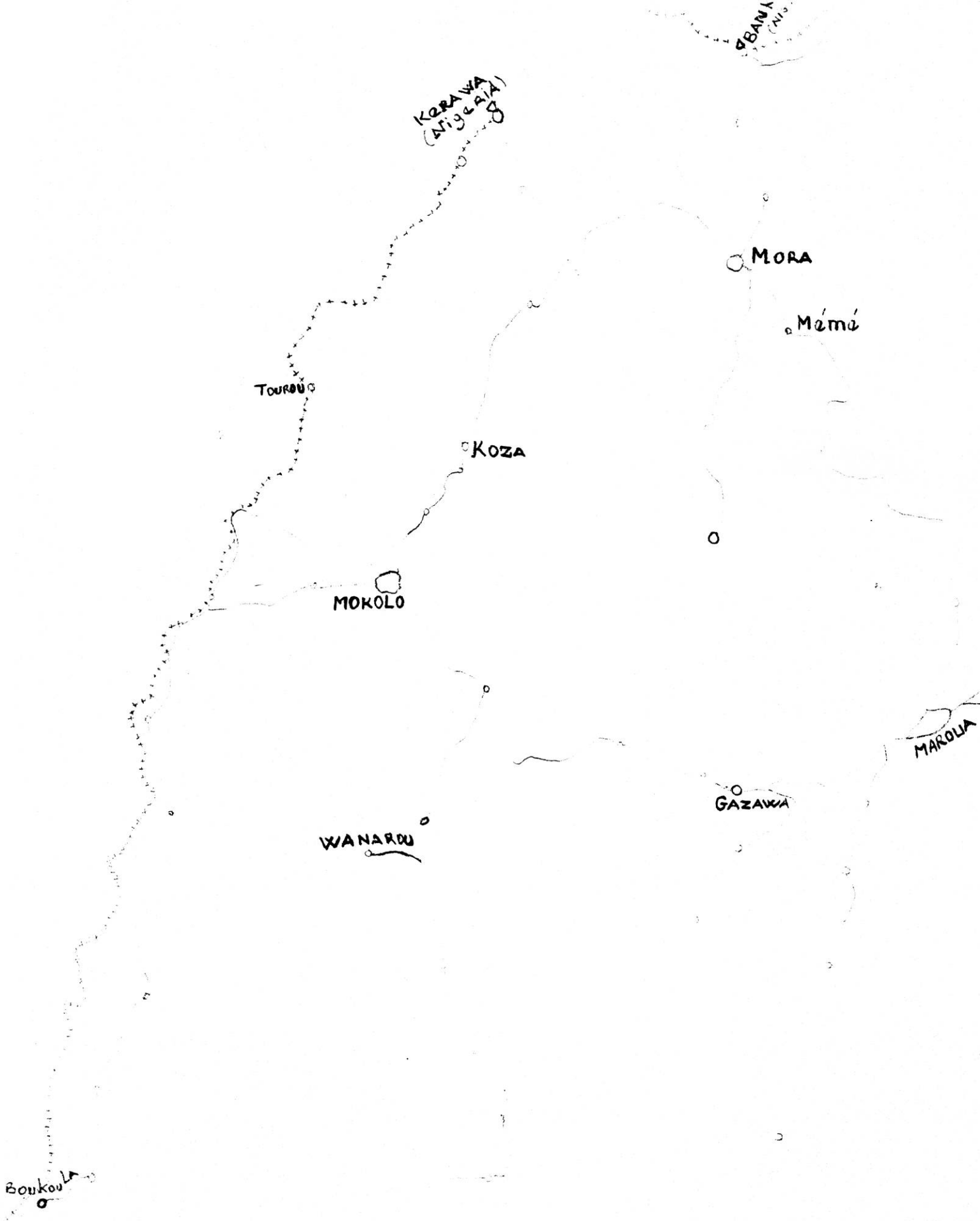
Large Regional Markets of the Project Area

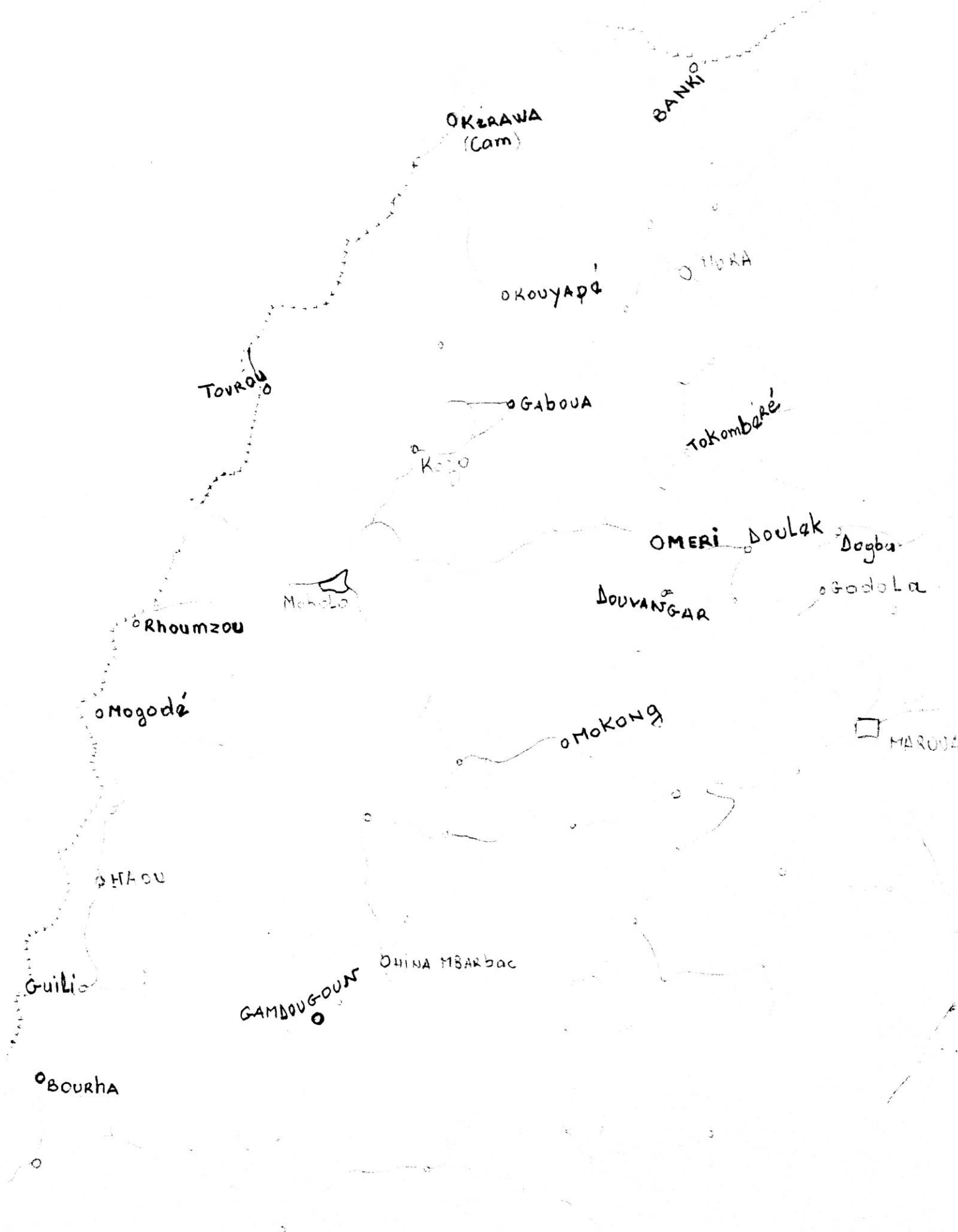
- MOKOLO - daily, big market on Wednesday; grain, cowpeas, pois voandzou, onions, vegetables, fruit, fish, beef, small stock, manufactured goods, etc.
- MORA - Sunday; grain, onions, pois vouandzou, cowpeas, peanuts, small stock, fish, beef, fruit, manufactured goods
- KOZA - Sunday; grain, small stock, onions, fruit, manufactured goods
- MEME - Friday; cattle, small stock, chickens, grain
- WANAROU - Tuesday; grain, peanuts, manufactured goods (mostly smuggled), cowpeas, pois vouandzou, small stock, wine
(Wanarou is exceptional in that it is not a large town. It is a large assembly market for agricultural commodities produced by the large rural population in the surrounding area and for smuggled goods imported from Nigeria.)

Secondary Markets of the Project Area

Larger Secondary Markets

- BOURHA - Friday; grain, peanuts, manufactured goods





DCGBA (Méri) - Sunday; grain, peanuts, cowpeas, pois vouandzou
 DOULEK (Méri) - Thursday; grain, peanuts, cowpeas
 GABOUA (Koza) - Thursday; peanuts, cowpeas, pois vouandzou
 GANDOUGOUM (Hina) - Thursday; especially during the dry season; peanuts
 GODOLA (Méri) - Saturday; peanuts cowpeas, grain, small stock
 GUILI - Saturday; grain, peanuts
 KOUYAPE - Friday; cattle, small stock, donkeys, grain
 MERI - Friday; grain, cowpeas, peanuts, small stock
 MOGODE - Monday; sweet potatoes, peanuts, grain
 MOKONG - Sunday; grain small stock
 ROUMZOU - Sunday; peanuts, sweet potatoes, potatoes, wine
 TOKONBERE - Tuesday; grain, small stock
 TOUROU - Thursday; virtually all transactions in Naira; grain, cowpeas, pois vouandzou, small stock, cattle, skins and hides

Smaller Secondary Markets

BANKI (Cameroun) - Tuesday	KOURGUI - Saturday
DJEBE (Meri) - Tuesday	MAGDEME - Tuesday
DOUVANGAR (Meri) - Wednesday	RHUMSIKI - Sunday
HAOU (Guili) - Tuesday	ROUA - Tuesday
HOULOUM (Meri) - Tuesday	SOULEDE - Saturday
KERAWA (Cameroun) - Thursday	ZAMAI - Monday

Principal Border Markets

BANKI - Wednesday; grain, cattle, small stock
 (Nigeria)
 BOUKOULA - Tuesday; grain, small stock, onions, fruit, manufactured goods
 KERAWA - Saturday; grain, manufactured goods, cowpeas, cattle,
 (Nigeria) small stock

Major Markets Outside the Project Area that Affect Trade Within the Project Area

MAROUA (Diamaré) - Monday; cattle, all major commodities, especially manufactured goods
 MUBI (Nigeria) - Wednesday; grain, livestock, manufactured goods
 GAZAWA (Diamaré) - Friday; cattle, small stock, grain, cloth, cowpeas, pois voandzou
 BOGO (Diamaré) - Thursday; cattle

II. CHANGE IN THE PRODUCTION AND MARKETING SITUATION

A. Expanding Inter-regional Trade - Increased Exports of Selected Cash Crops and Imports of Basic Food Crops

Our research results show that the Margui-Wandala Department (and the Project Area of Méri in the Diamaré Department) has experienced significant increases in inter-regional trade flows over the past decade. These flows involve a generalized increase in imports of basic food grains, livestock for slaughter, and an increase in exports of selected crops sold for cash, like peanuts, cotton, cowpeas, and other legumes, and tubers.

This conclusion is made from the results of the formal extensive and intensive surveys, and from informal surveys with selected merchants, farmers, transporting and public officials. The analysis also involves tests of clarity and internal consistency made on information gained in our surveys and with that gained from the official production statistics of the Margui-Wandala Delegation of Agriculture.

In some cases the official production statistics clearly support the evidence gained from the informal and formal studies carried out. In other cases, there is significant disagreement between the official statistics and the results from the survey work completed. We have tried to reconcile these conflicts but recognizing that considerable debate and additional information is required to make strong conclusions. To facilitate discussion of our results and comparison with official statistics, the data in Tables 2 and 3 are presented. Table 2 shows a comparison of our extensive survey results of per household crop production figures with figures developed from the official statistics on production and population from the Margui-Wandala, Delegation of Agriculture (Shown in Table 3). Information in these tables will be discussed in the last section of this report where specific commodity situations are examined.

Table 2. A Comparison of Extensive Survey Per Household Crop Production Figures with Delegation of Agriculture Per Household Crop Production Figures (in kg.)

CROP	Extensive Survey ¹	Delegation of Agriculture ²
SORGHUM R/S	337(36) ⁵	916
SORGHUM D/S	77(23)	143
MILLET	73(18)	220
MAIZE	16(7)	7
TOTAL CEREALS ³	503(45)	1286
COMPEAS	69(9)	35
SWEET POTATOES	127(43)	57
PEANUTS ⁴	72(15)	177
COTTON	200(50)	162

¹For the Survey Area

²For the Margui-Wandala

³The sum of sorghum, millet and maize

⁴The weights are for unshelled peanuts

⁵The numbers in parentheses are the standard errors of the estimates

Table 3. Selected Crop Production Statistics for the Margui-Mandala Department of Northern Cameroun, 1972 - 1979 (in tons) ¹

CROPS	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81
Millet and Sorghum R/S	74,000	70,500	110,716	91,480	91,600	74,249	95,825	96,666	-
Sorghum D/S	13,403	6,540	17,290	19,819	20,446	11,937	13,355	12,192	
Groundnuts - Oil	14,180	13,652	11,890	14,994	14,523	17,234	19,573	19,093	
Groundnut	52	183	209	176	146	-	-	-	
White Potato	82	210	800	840	1,170	1,923	1,105	1,200	
Garlic	-	18	130	4	-	-	-	-	
Onion	1,890	2,800	-	1,549	-	-	-	-	
Maize	213	270	380	205	253	274	482	637	
Sweet Potato	3,700	3,970	7,110	7,734	8,640	8,299	3,386	4,865	
Manioc	680	1,300	2,520	2,720	3,336	4,561	2,185	2,274	
Cotton	-	2,766	4,057	8,478	9,304	7,500	7,902	13,787	
Rice	91	65	140	-	289	229	249	210	
Sugar Cane	1,750	900	-	4,169	3,198	3,023	-	-	
Beans	1,530	448	552	683	1,016	3,080	2,143	3,013	
Vouandzou	826	225	212	270	318	782	137	802	

¹Crop years are from to .

Source: Ministère d'Agriculture; Délégation Provinciale du Nord, Délégation Departementale du Margui-Mandala - Selected Annual Reports.

B. Expanding International Trade

Trade with Nigeria has expanded greatly in the last decade, as population has increased steadily and incomes have increased rapidly with the inflow of oil revenues. The Nigerians have improved their road system, particularly in former backwaters like Bornu and Gongola States, which border on Margui-Wandala, and the productive capacity of the Nigerian consumer goods industries has increased, enabling Nigeria to supply its neighbors. One has only to cross the border at market towns like Boukoula, Kerawa and Banki to get a sense of the dynamic, although somewhat disorderly, development that is taking place in Nigeria. Gasoline is only 50CFA (25 Kobo) a liter, as compared to 150 a liter in Mokolo, and fleets of large trucks and smaller passenger vehicles can be seen transporting large quantities of goods and large numbers of people to and from the major urban centers of Bama, Maiduguri and Mubi. Even in a town as far from the border as Mora, the impact of the expanding trade with Nigeria is evident, as ample supplies of 100CFA a liter smuggled gasoline and dozens of Nigerian passenger vehicles attest.

A good deal of the trade between northern Cameroun and Nigeria is clandestine. The two countries share miles of common border, most of which is sparsely inhabited. Although the Government of Cameroun has invested considerable resources in trying to control the Nigerian-Cameroon trade, smuggling is relatively easy and carried out by large numbers of merchants. The illegal export of thousands of head of cattle has pushed up cattle and beef prices throughout northern Cameroun. This is a cause for concern in the Project Area, where protein consumption is low and in many instances inadequate. At the same time, the expanding cattle trade has created production and marketing opportunities for livestock raisers. Strong demand for beef in Nigeria gives Northern Cameroun, including the Project Area, a comparative advantage in livestock production.

C. Geographic Relocation of Markets

A number of markets, most notably Koza, Rhoumzou, Tourou, and Guili, have been relocated from mountain sites to larger, more accessible sites on the Plateau and in the Plains. This movement has taken place over the last 50 years in response to the local population moving out of the Mountains and into the lowlands, and to the need for accessible sites required by the increasing commercialization of once isolated communities. The relocations are further evidence of the increasing integration of former insular ethnic groups into the expanding commerce of the region.

1. Case Study of the Evolving Market in Wanarou.

Wanarou is located about ten kilometers west of Mayo Laddé, which is a town on the main road from Zamai to Hina. The access road as well as the main artery, are traversable only with great difficulty in the rainy season, which makes Wanarou a far more important dry season than rainy season market. Although the market was created only 16 years ago, it has become one of the largest markets in the Project Area. As many as 30 vehicles, including ten large trucks, come to the market on any given dry season market day from Nokolo, Gazawa, Maroua and Guider (Benoué). Wanarou is a small village, but the population in the surrounding area, which is mainly Kapsiki, Gawar, and Fulbé, is sizeable. This rural population produces peanuts, sweet potatoes, grain, pois youandzou, and cowpeas in large quantities, much of which is assembled at Wanarou for export out of the region. According to the market chief, the Wanarou market has become a major assembly market only in the past five years. During the first decade of its existence, the market was primarily a local foodstuffs and social market.

The goods that are bought and sold at Wanarou are not only agricultural commodities. A wide array of Nigerian consumer goods,

processed foodstuffs, and luxury goods is also available. Most of these goods are smuggled. Wanarou is somewhat remote and inaccessible and less likely to be supervised closely by gendarmes and customs officials. Most of the traders bringing Nigerian goods to the market are small-scale operators who transport their wares on donkeys.

Wanarou market is an example of an excellent potential contact point between increased rural development efforts and the rural population. It is a heavily attended market with an immediate market shed of at least 20 kilometers. Most of the farmers who attend the market produce cash crops like peanuts and sweet potatoes, and they would probably be receptive to any efforts to develop an improved agricultural package, including fertilizer use, and extension that might be constructively offered.

2. Case Study of the Evolving Market in Rhoumzou

The Rhoumzou market has been held along the main Mokolo-Garoua road since 1974. It was previously held at a mountain site about one kilometer away from the present location. Before 1974, the market was primarily a local foodstuff and social market where lots of wine-drinking and quarreling took place.

During the last six years the Rhoumzou market has become increasingly important as a peanut, cowpea and Irish potato assembly market. According to the market chief, the relocation of the market occurred at the same time as the first potato production in the Rhoumzou area. These Irish potatoes are sold exclusively in the marketplace. Local farmers have also cultivated sweet potatoes for many more years, and exports from the area began to take place 18 years ago. Local Kapsiki entrepreneurs have always dominated the sweet potato trade, buying up truckloads at the farmgate in order to sell in Kousseri and Garoua. These merchants rent seven-ton trucks for 50-60,000 CFA per round trip from transporters in Nigeria, Mokolo, Garoua and Kousseri. In contrast to the sweet potato trade, merchants from Mokolo and Garoua dominate the

the Irish potato commerce.

There are a lot of progressive farmers in the Rhoumzou area who have been quick to specialize in production of lucrative cash crops. Like Wanarou, the Rhoumzou market has potential as a contact point between farmers and efforts by the Agricultural Service. Production inputs could be easily marketed by private merchants or a public agency at the market, particularly in the late dry season when the market is well-attended. Some farmers in Rhoumzou are already procuring storage chemicals from Nigeria.

III. SUPPLY AND MARKETING SITUATION FOR PRINCIPAL AGRICULTURAL COMMODITIES

A. Millet Sorghum, and Maize

1. Supply and Import Situation

Flows of grain into the Project Area have increased in the last few years according to traders and farmers. Grain is imported into the region from Nigeria and the Diamaré plains. This year the volume of grain imports from Nigeria is especially large as farmers in the region claim that last year's harvest in the Diamaré Plains was poorer than usual. Last year the volume of grain imported from the Diamaré Plains was greater than the volume of grain imported from Nigeria, as it has been in most previous years, according to the informal interviews.

The official cereals production statistics collected by the Agricultural Service, which are shown in Table 4, do not strongly confirm that production shortfalls have made greater imports necessary. When population growth is taken into account, per capita cereal production does not appear to be trending downward. In fact, the data do not show that last year was particularly bad for cereal production. Yet in the interviews, farmers and traders insisted that last year's harvest was especially poor and that grain imports into the Project Area this year are unusually large. And during the 1980 rainy season, there was general agreement among all interviewed that 1) there was more grain for sale in the markets, and 2) this grain came largely from Nigeria.

Data on per household crop production from the extensive survey shown earlier in Table 2 are not in agreement with the official data. These show household cereal production to be 503 kg or 85.7 kg per person in the average size household. The extensive survey results ~~thus~~ indicate 1979 household production of cereals to be approximately 60% less than the official estimate of approximately 226 kg per

Table 4. Cereal Grain Production, Population and Per Capita Cereal Production for the Margui-Wandala Department 1972-1979

	1972	1973	1974	1975	1976	1977	1978	1979
Cereal Production ¹ (in tons)	87,613	77,310	128,386	111,504	112,209	86,460	109,662	109,495
Population ²	404,616	414,991	425,632	436,546	447,740	459,220	470,995	483,902
Per Capita Production	217	186	301	255	250	188	233	226

¹Sum of millet and both rainy and dry season sorghum, and maize

²Assumes a 1980 population of 496,310 and an approximate growth of 2.5% per year, from 1972 to 1979.

Source: Margui-Wandala Agricultural Delegation Statistics.

person.¹ It is difficult to reconcile these two estimates and choose one over the other as being more realistic due to the difficulty of estimating crop production. Estimates of standard minimum subsistence cereal needs of West Africa, however, are 200 kg per person. While we feel it is sure that 1979 was a below average year, it is not plausible for production to have been as low as 85 kg per person or some 40 percent of minimum subsistence requirements. A shortfall of only 80% of these minimum requirements would demand some 20,000 metric tons of imports into the region. This would represent over an 8 month period some 310 truck loads (8 ton capacity) per month, and there clearly is not even this much cereal grain moving into the region this year.

In order to systematically organize knowledge learned in the study about the basic cereal grain supply situation, we have developed the following lists of conclusions. The first list contains conclusions we feel can be strongly defended by results from the formal and informal surveys conducted. The second list is of weaker conclusions which require additional analysis.

Strong Conclusions on Cereal Supply Situation

1. There is a high rainfall variability in the region both on a year to year and within year, across region basis.
2. There is a highly variable individual farm and aggregate region crop production pattern, due to rainfall variability and interactions among rainfall, insect attacks and striga weeds.
3. The basic organization of the typical rural household farming system is geared toward planning for the grain shortfall years.

¹The estimates from the extensive survey are for the Project Area, which includes part of the Diamaré Department. Thus extensive survey results are not 100% comparable to official data for the Margui-Wandala Department. However, the area included from the Diamaré Department is quite similar to many areas of Margui-Wandala.

4. The basic farming system of the region is comprised of a complex assortment of crop, livestock, processing and labor selling enterprises.
5. There is considerable cash flow generated in the typical rural household to meet basic food, clothing and other basic needs.
6. Cash purchases of grain by rural households are paid for by rural households selling some or all of the following:
a) labor; b) small ruminants and chickens; c) wine and other processed food items; d) selected cash and food crops.
7. Cereal grains are definitely imported every year into the region. These imports vary considerably due to the marked variability of local production.
8. Cereal grain imports this year into the region are definitely higher than normal, and are considerable.
9. Last year's cereal production was lower than the official estimate, although not at all likely to have been as low as the extensive survey indicated.
10. The region is not self-sufficient in cereal grains, even in a normal production year.

Weaker Conclusions on Cereal Supply Situation

1. Per capita production of cereals is declining.

2. Cereal Marketing

After poor harvests, such as the harvest of 1979-80, imports of cereals are required to compensate for production shortfalls. This year grain merchants from Mokolo north to Mora, Mémé and Tokombéré have been buying up sorghum at the large Nigerian cereals markets of Kerawa and Banki. The Plateau area south of Mokolo tends to be more nearly self-sufficient than the Mountains, but Nigerian grain from Gongola State, much of which is assembled at Lubi, is also being imported into the region. There is a price differential of 500-1500CFA per eighty kilogram sack of sorghum which has made it possible for Cameroonian traders to buy in Nigeria and covers transport and other costs of importing. Transport costs range from 250-750CFA per sack. This opportunity appears unusual, since Northeastern Nigeria is generally considered a grain deficit region.

The grain trade appears to be highly competitive in the Project Area. Aside from a limited number of wholesale traders in Boukoula, Mokolo and Koza, most traders operate on a small-scale, buying directly from producers and selling to consumers. In addition, many of the sellers of grain in secondary rural markets and in larger markets in the Plains are producers who sell surplus stocks. Some traders complained about the depressing effect these sales have on grain prices and hence their profit margins.

Over half of the 31 grain sellers we interviewed accumulate stocks at the end of the harvest and during the dry season from which they sell grain late in the dry season and throughout the rainy season. They store the grain most commonly in dry rooms at their compounds, although some keep the sorghum in granaries protected with insecticides. Six of the sixteen traders who store, reported storage losses since last year, which they attributed mainly to insects and rodents. Roughly of each trader's stock was lost per month.

In some of the larger markets there are covered storage facilities where traders can store their grain for rental rates of 100-150 CFA a month. When asked what they would do if the government granted them loans, eighteen of the 31 traders said they would build better storage facilities and acquire a larger stock of grain.

Grain storage by traders helps smooth out seasonal price fluctuations. Returns to storage appear adequate to motivate merchants to undertake storage as illustrated by the following set of calculations.

Table 5 Last Year's Monthly Acquisition and Sales Prices for Eighty Kilogram Sacks of Rainy Season Sorghum, as reported by traders

	Jan.	Feb.	Mar.	April	Aug.	Sept.	Oct.	Nov.	Dec.
Acquisition	4756	4756	4764	4764					
Sale					6623	6623	6640	6590	6364

Table 5 shows that a sack of rainy season sorghum bought in February at a price of 4756 CFA sold for 6623 CFA in August. The average storage period reported by traders was 6.5 months.

According to the estimates of traders who suffered storage losses, the average loss over the 6.5 month period was 9% of their stock. This is perhaps an overestimate, but it will be used for illustrative purposes. If traders who store but claim they have no storage losses were included in the above calculation, then losses over the half year period would be much lower.

Assuming that losses are 9% of the grain in storage, the value of the grain lost would be 445 CFA per sack. Transport from Nerawa, Nigeria to Nokolo would cost 500 CFA per sack. The cost of carrying the inventory over a half year at an annual interest rate of 20% is 515 CFA. The actual cost of storage as reported by Nokolo grain traders, is about 5 CFA per sack per month or 33 CFA over the course of 6.5 months. The total of the above costs is 1499 CFA. Subtracting

this from the gross return of 1867 yields a net return of 374 CFA per sack, which is 7.9% of the acquisition price. Hence, returns to storage appear adequate and do not appear to be unduly high.

All the Nigerian grain traders that we interviewed who store grain (five) treat the grain chemically. Eight of twelve Cameroonian traders who store grain also use chemical powder, which is probably acquired in Nigeria. Traders are usually quick to respond to innovations such as chemical treatment of stocks, as shown by the Nigerian traders. Making similar inputs available on a wider basis in Cameroonian markets would probably lead farmers to acquire them for their own use.

None of the grain traders that we interviewed owned vehicles which they use for transport. Eleven own donkeys, however, and three own bicycles. Most of the large-scale grain traders, like the two wholesalers in Mokolo, rent trucks to transport their grain. These two are forced to rent Nigerian vehicles, since no trucks are available for rent in Mokolo. Twenty-two of the 31 traders interviewed complained about transport problems, citing the lack of public transport (13), the lack of money with which to buy or rent vehicles (9), and the poor condition of the roads (12) which cause grain and vehicle damage as the principal problems. When the interviewees were asked about the most serious problems affecting their business, twelve spoke of the poor condition of the roads and ten of the lack of public transport.

One way to improve transport opportunities for traders would be to make loans available for individual traders or groups of traders who could then rent or purchase vehicles.

When traders were asked what they would do if the government granted them loans, ten of the thirty replied that they would purchase a vehicle for transporting goods. Although this sort of

loan is anathema to most governments of developing countries, which view traders as parasitic "middlemen" it might promote greater commercialization of the project area. It should be recognized, however, that the major problems of the region are more fundamental than transport opportunities for traders. Yet by making loans available to traders for acquiring means of transportation, the government could indirectly help to resolve some basic agricultural problems by improving farmers' access to needed production inputs. As transportation improves and traders obtain stocks of fertilizer, insecticides and pesticides, production inputs would also become available on a wider basis.

B. Cowpeas, "Pois Vouandzou," "Pois Souchet"
and Other Legumes

Table 3 shows that cowpea (bean) and vouandzou production have varied considerably over the last eight years but that the general trend is upward. Cowpea production in particular has increased, nearly doubling between 1972-73 and 1979-80. These legumes are usually intercropped with sorghum and millet. They provide the soil with nitrogen, helping to maintain soil fertility. The extensive survey showed that only 10% of last year's cowpea crop was sold. Farmers grow cowpeas and other legumes as subsistence crops, so they do not ordinarily enter the market. During the course of our marketing research we noted that much smaller quantities of legumes are present in markets in the project area than grain. However, it is very common for producers near the border to sell their cowpeas and pois vouandzou in Nigeria, where prices are reported to be higher.

Cowpeas and other legumes are produced primarily in the Mountains, the Upland Piedmont and the Plateau. Farmers, often women, sell these legumes in small quantities to small-scale traders most of whom are farmers also. These traders transport the legumes

to frontier markets like Boukoula and Kerawa, where they are sold to Nigerian assemblers, and to Gazawa and Haroua, where they are sold to Cameroonian assemblers who ship the legumes south.

There is no time series data for cowpea and legume prices, and prices reported by traders for the period 1979-1980 show no clear pattern. It appears, however, that seasonal price variation is not excessive since cowpeas and other legumes store well and farmers tend to sell out of storage.

When the eleven legume traders interviewed in the course of the marketing research were asked what their principal problems were, they reported that they lacked capital and means of transportation. Only two of the traders have their own means of transport, which are donkeys. Other traders depend on public transport, usually in the form of pick-up trucks. When asked what they would do if the government granted them loans, most of the traders said they would expand their scale of operations, while others claimed they would buy vehicles to transport their goods.

Only one of the six legume traders who store what they buy for any period of time longer than a week treats his products chemically. The others suffered moderate losses due to insect damage. Making storage powders available to traders, perhaps by allowing them to be freely imported from Nigeria, would help reduce these losses.

The project has a potential comparative advantage in producing and trading cowpeas and other legumes. Presently, however, these crops are not produced and sold in large enough quantities to generate much income for farmers. The legumes are intercropped with cereals, because they improve soil fertility and hence keep cereals yields from dropping and because they supplement the grain sorghum-based diet. The beans also provide additional plant protein

in the diet. Farmers sell beans in small lots in order to buy grain and meet other cash needs. When these sales occur, farmers are trading off protein for calories in their diets. This could have a negative nutritional effect depending on existing diets and needs. Yet, increasing legume production and some sales has a potentially high payoff. There appears to be sufficient demand outside the Project Area to justify increased legume sales.

C. Groundnuts

The statistics collected by the Agricultural Service show an upward trend in groundnut production since 1972-73, with production levels being significantly higher in the last three years. Farmers interviewed in the intensive survey have reported, however, that the groundnut harvest was exceptionally poor in 1979-80. According to estimates obtained during the extensive survey, groundnut production averaged 115 kg per cultivating household in the Project Area in 1979-80. Using the Agricultural Service production figures for Margui-Wandala as a base, estimated groundnut production per household (not per cultivating household) reached 226 kilograms.

Despite these discrepancies in production estimates, it is clear that groundnuts are an important cash crop for farmers in the Project Area, particularly for those in the Mountains, the Piedmont and the Plateau. Although only 49% of the harvest had been sold by the time of the extensive survey (May 1980), 32% of the crop was still in storage, as farmers were waiting for higher prices. After normal harvests probably 30-50% of the groundnut crop is sold. It is quite common for a farmer to earn 50,000 CFA from groundnut sales and not unusual for farmers to earn 100,000 CFA.

A large proportion of the groundnut crop trade is controlled by a handful of wealthy buyers based in Lokolo, Maroua and Garoua.

The buyers based in Nkololo, Maroua and Garoua employ agents who purchase groundnuts in rural markets, which are then assembled in the large cities of the North for export to Southern Cameroun. There are at least half a dozen agents in Nlogode, which is in the heart of an important groundnut producing region, who assemble for wealthy patrons based in Maroua and Garoua. There are also imports of Nigerian groundnuts which are assembled on the Plateau south of Guili for export to Southern Cameroun.

There are allegations of concentration and price fixing in the groundnut trade. Most transactions take place in rural markets like Rona, Soulede, Wanarou, Gamdongoua, Rhunzou, Sir and Nlogode, where agents for the large traders buy directly from producers. Most of the agents weigh the groundnuts offered for sale and pay by the kilogram. The government sets an official buying price (75 CFA/kg in 1980), which it infrequently enforces during the Campagne Arachidière (February - April). Groundnut buyers usually offer farmers higher prices, particularly after the official campaign is over. After poor harvests, like the preceding one, the groundnut trade becomes more a seller's market than it is normally. A sack of groundnuts presently sells for 20,000 CFA or 250 per kilogram. After a good national harvest year there is some evidence that excess aggregate supply drives prices down quickly.

Since groundnuts are a lucrative cash crop for most of the farmers in the Project Area (63% in 1979-80), production should be promoted. There is also a strong demand for groundnut leaves for fodder in Southern Cameroun and Nigeria to merit increased production in the region. These would be small relative to national supply. Applied research and extension efforts to discover means of augmenting yields could provide valuable assistance to the

region since groundnuts are the major cropping enterprise that helps generate cash to deal with grain shortfalls. As with cereals and cowpeas, any commercial inputs needed could probably best be distributed by the groundnut traders themselves, for the larger buyers have extensive networks of agents who are in frequent contact with the producers.

D. Onions

Onions are a specialty crop that is produced in the Plains. A high water table that makes irrigation feasible is an important prerequisite. The Mandara, a Plains ethnic group, dominates onion production and trade. Trade flows appear to be limited, although onions are transported from the Plains to larger towns like Mokolo, Koza and Mora. Although the demand for onions is strong in Mokolo, there is limited potential for onion production in the Mountains, where irrigation is generally not feasible.

The main problem with the onion trade is the variability in supplies and hence prices according to the season. Returns to storage are potentially high, but onions do not store well in hot climates, particularly once the rains begin. Most of the onion traders reported that spoilage was a serious problem. Aside from encouraging producers and traders to store their onions in cool dry places, there is little else that can be done to improve storage, without substantial investment costs.

The potential for expanding the onion trade in the Project Area is limited. Perhaps the government can make loans available to producers in villages in the Plains for constructing shallow wells from which irrigation water can be drawn. This would permit extension of the production season to take advantage of inter-seasonal demand. Other than this possibility, no other interventions

are recommended.

E. SWEET POTATOES and Irish Potatoes

Agricultural Service estimates show an upward trend in sweet potato production; although overall production appears to have fallen off in the last two years. The extensive survey showed that sweet potatoes were produced by nearly two-thirds (65%) of the households on the Plateau and by one-fifth of the Households in the Mountains during the year before the survey. According to the survey data, production on the Plateau averaged nearly a ton (975 Kg.) per producing household and somewhat less than a half ton (44 kg.) per household in the Mountains. At a farmgate price of 1200 FCFA per 100 kilogram sack, the average farmer on the Plateau, who sold 84% of his crop, earned 9830 FCFA for his sweet potatoes. The average producing household that was interviewed in the Mountains sold 69% of its crop, earning a considerably lower 3640 FCFA. Informal interviews with producers on the Plateau revealed that it is not uncommon to earn 100,000 FCFA from sweet potato sales. Hence, the extensive survey statistics may underestimate the volume of sales. It is certain, however, that sweet potatoes are an important cash crop for farmers in the Mountains and on the Plateau. These regions have a comparative advantage in sweet potato production.

~~Sweet potatoes are exported from~~ the Plateau and the Mountains to Mokolo and more distant markets like Maroua and Kousseri. Before the 1970s sweet potatoes were shipped to Kouppé (Cameroon) and the Nigerian Markets of Kerawa and Barki. During the last ten years the sweet potatoes have been sold in Cameroonian markets, suggesting that the Nigerians are now able to supply their own needs. There are seven sweet potato traders in the Roumzou area and four in Mogode. There are also four or five buyers from the southern part of the Plateau and three or

four from Maroua. The traders from the project area rent large trucks, usually from Nigeria, to buy directly from farmers in rural areas. A truckload consists of 60 sacks or about five to six tons of sweet potatoes. Assembling and transporting the sweet potatoes to Maroua or Kousseri costs about 50,000 FCFA or 833 FCFA per sack. When asked about their principal problems, the four sweet potato traders that we interviewed complained most about lacking their own means of transport and the poor condition of the roads in the project area, which cause damage to their product. All four traders reported that they would buy trucks if they received loans from the government.

Probably the greatest constraint to expanding the sweet potato trade is spoilage. Farmers are forced to sell the crop immediately after the harvest. By the time of the extensive survey, only 3% of the sweet potato crop produced on the Plateau was in storage and none of it was being stored in the Mountains. Unable to store the crop, the farmers dump it on the market, creating an oversupply situation. The glut of sweet potatoes on the market after the harvest drives the price down in distant markets such as Maroua and Kousseri, where traders are sometimes forced to sell without realizing any profit.

One way to avoid the depressing effect that farmers' present marketing strategies has on prices would be to stagger planting and harvesting schedules. The agricultural extension service could also provide producers with better information about sales opportunities and the overall supply and demand situation. This would improve growers' timing of sales and could increase their return from sweet potato production.

Irish potatoes are also grown on the Plateau around Roumou and by selected amountain households. The trade in Irish potatoes is relatively recent, having begun in the last decade in the Project area. The demand for potatoes is essentially urban-based and hence limited within the project area. Some of the potatoes produced in Roumzou are sold in Mokolo, but the market with the greatest potential in northern Cameroun is Maroua. Three traders based in Mokolo and two in Maroua buy up potatoes on the Plateau for sale in Mokolo and Maroua. Since the population of Maroua is expanding rapidly and incomes are high enough to permit potato consumption, Maroua is an especially promising market.

As production inceases and prices begin to fall, more consumers will be able to afford Irish potatoes, which are presently a luxury. Yet expanding production may lead to surpluses of the potatoes that will lower growers' returns in much the same way that the uncoordinated post-harvest sale of sweet potatoes often lowers sweet potato producers' returns. Additional research should be done to determine the effect greater marketed quantities will have upon potato prices. It appears however that relatively few growers could increase production without significantly lowering returns in the next few years. So, while there are limited opportunities for potato production expansion, these are not wide spread. As with sweet potatoes, greater coordination of planting, harvesting and marketing schedules, so as to avoid temporary oversupply situations, may become necessary as production increases.

F. Fruits and Vegetables

A very limited amount of land with a high water table and the lack of fruit tree nurseries constrain fruit production in the project area. As a result, the supply of fruits like mangoes, guavas, limes and avacados is

limited and prices are accordingly high. Despite the high prices, demand appears to be very strong, especially in urban markets like Mokolo, Mora, Koza and Boukoula, where even non-indigenously produced fruit like bananas and pineapples can often be purchased. Mangoes and guavas are also available in rural markets, where producers have no trouble selling.

Given the strong demand for fruit in the project area, it appears that moderate increase in fruit production will not lead to an oversupply of fruit on the market, at least not in the foreseeable future. Increasing fruit production in areas below new dams and other areas where there is sufficient water would provide some farmers with greater income-earning opportunities. This would not be, however, a broad-based intervention affecting large numbers of farmers in the project area. Many of the beneficiaries would be farmers who already benefit from a superior resource base (high water table, more fertile soils) for agricultural production. Unlike the demand for fruits the demand for vegetables is extremely limited outside urban markets like Mokolo and Mora.

— Whereas guavas and mangoes can be found in most secondary rural markets, vegetables are rarely present. Yet a surprisingly high percent (11) of the male household heads in the Mountains that were interviewed during the extensive survey reported that vegetable production was one their principal income-generating activities. This probably has a lot to do with the fact that five of the eleven extensive survey sites in the Mountains are within walking distance of Mokolo.

The potential for exporting vegetables out of the project area appears to be limited. Vegetables are highly perishable, and they usually get badly bruised when transported for long distances over poor roads. Furthermore, the Maroua market may become saturated as FONADER has begun to grant loans to farmer in Diamare Department for vegetable cultivation.

SUMMARY OF PROBLEMS AND SUGGESTION
FOR IMPROVING COMMODITY MARKETING

A. Problems

1. Marketing Agents and Functions

Inspite of the fact that famers sell a relatively small percentage of their cereals, the marketing system for these basic commodities is very important because of the significant variability in cereal production. Farm households must be able to purchase cereals in markets during their short fall periods. The major problems with cereal marketing encountered during the study relate to the cost of performing the basic functions of transportantion, storage and the pricing(having accurate information regarding aggregate supply and demand conditions) of commodities placed in ~~these~~^{open} markets. Little evidence was found for excessive profits in the grain trading sector, although seasonal price spreads are large in order to cover high costs. ⁴ Farmers may be at more of a disadvantage in bargaining with assemblers who buy cash crop commodities at the farmgate or in isolated rural markets. Farmers sell sweet potatoes and potatoes in large lots to traders at the farmgate shortly after the harvest. They say they are offerred low prices for sweet potatoes, but this is more a function of oversupply at harvest time and the unacceptably low returns that traders would realize if ~~they~~ offerred producers higher prices. Since the groundnut trade is highly concentrated, farmers may not always be able to attain far prices for their peanuts. This year is not a good time to make any kind of judgement regarding the fairness of groundnut prices, however, since the limited supplies following a poor harvest have given producers considerably greater bargaining power than after abundant harvest. In general, however it appears that improved market information for these type crops could improve farmer bargaining power.

2. Transportation Situation

The roads in the project area are in poor condition, particularly during the rainy season. Secondary farm to market roads become impassable. The poor transport system further isolates many areas in the region which are already removed from major markets by distance and rugged terrain. It also leads to considerable product losses when traders do move goods over the roads. In addition, vehicles depreciate very rapidly after a year on roads in the project area. As a result, wealthy individuals are reluctant to invest in trucks and pick-ups that can be used to transport goods. Hence, public transport between major towns and secondary markets is infrequent and irregular. Similarly, few trucks are available for rent.

3. Storage Situation

Farm-level, trader and market storage facilities are generally inadequate. Post-harvest losses for cereals appear to be high, and certain crops, such as onions, sweet potatoes and potatoes are highly perishable under present storage conditions. Products for treating stored commodities are lacking, as are cool and dry storage facilities for minimizing spoilage of more highly perishable crops. Grain storage magazines for traders are virtually non-existent outside of major markets like Mokolo and Mora.

4. Input Supply Situation

The marketing system has not been able to supply farmers and traders with needed inputs like fertilizer, insecticides and pesticides, first because these inputs are simply not widely available (outside of SODECOTON) in Cameroun. Limited quantities of chemical powder to reduce storage losses are often available in markets bordering Nigeria. Second, however, most farmers do not know about the utility of the use of production inputs, even in areas located close to Nigeria. Part of this is due to the underfinancing of agricultural extension service activities. However, even with an improved extension program, there is relating little that could be extend to farmers. Third, then, the input situation is constrained^{p.r} the very limited focus of post research on developing improved inputs and input management practices for the basic crops found in the farming system of the region.

B. Recommendations for resolving Marketing Problems

1. Possible Transport Interventions

The volume of vehicle traffic over the roads in the project area probably do not justify massive interventions in road construction. However, improvement and better maintenance of existing roads, especially where temporary flooding occurs, could help improve the transport situation. Some investment in secondary roads may also be worthwhile, but these potential investments deserve careful analysis. Aside, from economic reasons for constructing and upgrading secondary roads, there are political and administrative considerations. For example, improving the Mokolo-Tourou road might tie Tourou in more closely with the Cameroonian economy. Presently most transactions require Nigerian money, as the area around Tourou is clearly in the Nigerian economic orbit. Similarly, improving the Mokolo-Souledé-Roua-Meri road might help to involve Meri, which is in Diamaré Department, more deeply in activities taking place in the rest of the project area, which is in the Margui-Wandala Department. Those political and administrative considerations aside, the roads most often cited for upgrading are the Koza-Kerawa, Mokolo-Tourou, Mokolo-Meri, Meri-Tokombere-Warba and the Zamai-Gawar-Hina routes.

Rather than investing all project funds for transport improvements in road construction and maintenance improvement, it may be advisable to allocate part of the resources to a loan program that would enable public transporters and traders to purchase buses, trucks and pick-ups. Along with a program to better maintain roads, this would probably increase passenger and commercial flows in the project area, while it would put the burden of repayment on transporters and traders. By providing loans to public transporters who would move both passengers and freight, more small-scale merchants and farmers could become involved in commodity trade.

2. Improving Storage and Market Coordination

Granting traders licenses to import large quantities of protective storage chemicals from Nigeria would benefit farmers who are presently suffering significant storage losses. Yet it is not clear whether most producers in the project region, are aware that storage losses can be reduced, or for that matter, they appear to be unaware of what the real magnitude of losses are. (Merchants are more aware of this) Thus there appears to be a potentially high pay off from applied research and extension efforts to better understand the nature and cause of storage losses, and to speed up the diffusion of such potential innovations. Some emphasis on the economics storage improvements for onions and potatoes also appears to have a good potential pay off. In addition to working to lower storage losses, more should be done to develop better ways of coordinating planting,

harvesting and marketing of more perishable crops like sweet potatoes, potatoes and onions. As discussed above, producers dump these commodities on the market following the harvest, depressing prices and lowering returns to labor. By better targeting the planting and sales of sweet potatoes, potatoes and onions for selected market periods, it should be possible to better control the overall supply situations that make farmgate prices unattractive to producers. It may also be possible to extend the growing season in certain climatic zones. In addition, producers could be provided with price and marketing opportunity information that would enable them to make better decisions regarding the timing and location of sales.

Finally, market infrastructure for basic grains could be improved, particularly in secondary markets, where storage facilities are nonexistent or inadequate. Some of the money that is collected from traders at weekly markets by the government could be used to construct storage facilities at the markets. Charging traders, weekly or monthly storage fees would help to pay back the construction costs.

2. Production and Distribution of Agricultural Inputs

The Strengthening of applied research and extension efforts within the project area is needed to begin the process of developing realistic and economical improved inputs for the important enterprises of the farming systems. These new inputs will have to be produced on a large scale and put into cost effective distribution systems. One way of making agricultural production inputs available to local farmers would be to grant traders licenses to import selected fertilizer, insecticide and pesticides from Nigeria. It is not clear, however, that the Nigerians would be willing to allow substantial exports of production inputs to Cameroon, which is not a member of ECOWAS. Nigeria has a large rural population that produces agricultural commodities and therefore requires inputs like fertilizer, insecticides and pesticides. These inputs tend to be allocated to cash crop production, and they are probably not available in large quantities for export from Nigeria where cereals' deficits have been a chronic problem.

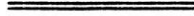
Assuming that private traders were able to acquire stocks of inputs, their involvement could minimize costly government procurement and storage of inputs. Two other ways of distributing production inputs would require a Public Sector project authority to undertake the productions or to procure large quantities of inputs from Nigeria or other sources. Project funds could be earmarked for this purpose. The inputs could then be sold directly or provided on credit to farmers. In the ^{second} case the Public Agency could produce or acquire the inputs, and sell to private traders who would in turn distribute them to farmers.

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- No. 12 Trechter, David. "Nutrition and Health During the Hungry Season in the Mandara Mountains of Cameroon." January, 1981.
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Problems of oversupply and the ensuing low prices for sweet potatoes and potatoes may be able to be resolved by better coordination of production and marketing strategies, grower access to information about marketing opportunities, extension of the growing season and improved storage.



This second alternative would eliminate the government's having to ^{undertake} marketing function, which could probably be performed more timely and cost effectively by the private sector.

3. Producer and Market Price Information

Agricultural Service extension agents attend local foodstuff markets fairly frequently in order to monitor commodity prices and determine whether transactions between traders and farmers are conducted to the latter's disadvantage. Yet they are not producing reliable and accurate price information which could be systematically extended to farmers. A strengthening and partial reorganization of the current efforts could begin a needed program to systematically keep rural producers apprised of price trends in different parts of the project area. SODECOTON is already making radio broadcasts of extension programs, and the Agricultural Service could also use the radio network to outline general price trends of principal commodities. Fulfulde is the Lingua franca of the project area, as well as most of Northern Province, and radio programs are presently broadcast in Fulfulde from Garoua. Weekly fifteen minute broadcasts would probably be sufficient to begin a program of keeping farmers abreast of commodity price trends.

4. Observations on Potential Comparative Advantage of the Region

Under the present set of perishability, storage and transport constraints the project area offers a comparative advantage for the greatest number of farmers in the production of groundnuts, cowpeas and other legumes. The groundnut exports from the project area are substantial in most years, although quite low this year. Cowpeas and other legumes are marketed in low quantities, but there is demand for these commodities in the Koza-Mora and Diamare Plains and in Nigeria. In addition, cowpeas are exported to centers of demand in Southern Cameroun. The special advantage of the above commodities is that they can be stored for long periods of time with minimal spoilage. In addition, they can be transported great distances with little damage.

Promoting the production of these crops, as well as cereals production may require inputs of fertilizer, insecticides and pesticides. Applied research is needed to determine the responsiveness of groundnut and legume production to application of these inputs. It may be that the return from using production inputs does not justify the cost of obtaining them.

Sweet potatoes, potatoes and fruits are other crops that offer a comparative advantage for farmers in certain fertile and well-watered areas in the project zone. Perishability is a major constraint to producing more for the market, however, as farmers are compelled to sell shortly after the harvest.

