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This report is a result of a request by USAID/Niamey to conduct a rapid appraisal of the marketing system for cowpeas in Niger under the Agricultural Marketing Improvement Strategies (AMIS) Project. It is intended to provide an overview of the organization and functioning of the market and to identify systems constraints and opportunities. A major objective of the study is to analyze marketing, regulatory and fiscal policies and their effects on market performance, especially with regard to exports. The first phase of the study was carried out in May/June 1988, and a second phase was conducted in November/December 1988. Most of the field work was carried out in Niger, although visits were also made to Nigeria and Benin to explore market channels for Niger cowpeas.

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**A RAPID APPRAISAL OF THE
MARKETING OF NIGER COWPEAS**

MAY 1989

**A RAPID APPRAISAL
OF THE MARKETING OF NIGER COWPEAS**

Submitted to:

U.S. Agency for International Development

Niamey, Niger

Under PIO/T 698-0510-83-3

By:

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Strategies Project (AMIS)**

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MAY 1989

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GLOSSARY OF ACRONYMS

APS	Agricultural Production Support Project.
ASDG	Agricultural Sector Development Grant.
BIAO	Banque Internationale de l'Afrique Occidentale.
CA	Centrale d'approvisionnement.
CLUSA	Cooperative League of the USA (still known by this name in Niger, though now officially re-named National Cooperative Business Association).
CNCA	Caisse nationale de crédit agricole.
CNCE	Centre nigérien du commerce extérieur
CNUT	Conseil national des utilisateurs des transports à Niamey.
CRSP	Collaborative Research Support Program (e.g., Bean and Cowpea CRSP)
DEPSA	Direction des études et de la programmation des statistiques agricoles.
GM	Groupeements mutualistes villageois.
GON	Government of Niger
ICRISAT	International Center for Crop Research in the Semi-Arid Tropics.
IFPRI	International Food Policy Research Institute.
IITA	International Institute of Tropical Agriculture (Ibadan, Nigeria).
ILP	Integrated Livestock Project.
INRAN	Institut national de recherche agricole du Niger.
NAMCO	Nigerian Agricultural Marketing Company
RA	Rapid appraisal.
SNTN	Société nationale des transports nigériens.
SONARA	Société nigérienne de l'arachide.
SOTRAMIL	Société de transformation du mil.

UNC	Union nationale de cooperatives.
URC	Union régionale de coopératives.
USAID	United States Agency for International Development.

- Notes:**
- (1) Due to possible confusion over the terms "Nigerien" and "Nigerian", the country names "Niger" and "Nigeria" are used in place of their adjective forms in some passages.
 - (2) Monetary units of cfa francs (West and Central African francs) are abbreviated as "cfa" in this report.

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Bechir Rassas and Millie Gadbois, agricultural economists and independent consultants, participated in both phases of the RA field work, carried out in May-June and November-December 1988, and drafted most sections of the Report. Rassas drafted the original executive summary, part one, most of part two, the sections on cowpea consumption and prices in part three, sections of the original part four, and several annexes. Gadbois drafted the section on cowpea production in Niger in part two, the sections on the production and marketing systems in Nigeria in part three, and other sections in parts two and four. Dr. R. Dixon Phillips, a food technologist at the University of Georgia Experiment Station and participant in the USAID funded Bean and Cowpea CRSP, accompanied Rassas and Gadbois to Niger in late November-December 1988 to participate in the second phase RA field work, and drafted sections of the report on cowpea processing and storage in Niger and on cowpea utilization in Nigeria. Dr. John S. Holtzman, senior agricultural economist and research director of the AMIS Project, edited the report, making substantial revisions of some of the original sections, finalized the executive summary and part four of the report, participated in the drafting of the section on cowpea price and storage analysis, drafted the section on the cowpea consumption gap in Nigeria, and prepared several annexes. Richard Abbott, AMIS agritusiness advisor, provided research management and direction to the RA team (especially Rassas and Gadbois), and coordinated the organization, editing and production of the Phase I and II reports. Since all five individuals were heavily involved in production of the final report at various stages, authorship is shared. Collaboration in the field work in Niger and Nigeria by Hararou Djibo of USAID/Niger and Idrissa Seydou of the Ministère du Commerce is also gratefully acknowledged.

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cooperation and participation of public officials and researchers and private entrepreneurs in both Niger and Nigeria in carrying out the field work, many of whom are listed in Annex 2. AMIS is, of course, responsible for any errors, omissions or misinterpretations in the final document.

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EXECUTIVE SUMMARY

This report is a result of a request by USAID/Niamey to conduct a rapid appraisal of the marketing system for cowpeas in Niger under the Agricultural Marketing Improvement Strategies (AMIS) Project. It is intended to provide an overview of the organization and functioning of the market and to identify systems constraints and opportunities. A major objective of the study is to analyze marketing, regulatory and fiscal policies and their effects on market performance, especially with regard to exports. The first phase of the study was carried out in May/June 1988, and a second phase was conducted in November/December 1988. Most of the field work was carried out in Niger, although visits were also made to Nigeria and Benin to explore market channels for Niger cowpeas.

Organization and Functioning of the Cowpea Subsector

Expansion in Cowpea Production. Cowpeas comprise nearly 90 percent of area cultivated to cash crops in Niger, and their importance in total area cultivated is second only to millet. With only a small portion of the crop consumed by farmers and with exports exceeding two-thirds of production, cowpeas have played an increasingly dominant role in the Niger rural economy and in the agricultural export sector. Since the 1960s and early 1970s, farmers have shifted out of peanuts and into cowpea production. Cowpea area and production expanded at annual average rates of 5.3% and 7.4% respectively from 1960 to 1986. In contrast, peanut area and production declined at average annual rates of -5.1% and -8.0% over the 1960-1988 period.

Low Levels of Cowpea Consumption in Niger. Cowpea consumption in Niger is estimated to be less than 40,000 tons, or only an average of 16 percent of total production over the 1976-1987 period. Per capita consumption is estimated at 3 kg. per year in urban areas, 7 kg. in rural areas and 6.2 kg. for the country as a whole. Campaigns to promote the nutritive benefits of cowpea consumption in Niger have remained largely ineffective owing to the slow process of changing food consumption habits, the status of cowpeas as the major cash and export crop, and their high price relative to other food crops.

The insignificance of cowpeas in the local diet in Niger and their low share in total household expenditure suggest a low price elasticity of demand. Urban and rural consumption patterns also indicate that cowpea consumption may be negatively correlated with income. These results demonstrate that domestic demand for this crop is unlikely to increase significantly in the near future and that exports must continue to

play a vital role in the Niger cowpea market. Improved cowpea storage and processing technologies might cut storage losses, reduce labor allocated to processing, improve the quality of cowpeas, and increase cowpea consumption at the margin, however.

Cowpea Exports to Nigeria: Predominance of the Unofficial Trade. Cowpea exports averaged more than 160,000 tons between 1976 and 1987, representing approximately 69 percent of total production (allowing 15% for seeds and losses leaves 16% for local consumption.) The Société Nigérienne de l'Arachide (SONARA), the parastatal which had a legal monopoly on cowpea exports between 1976 and 1984, actually marketed on average less than 12 percent of total estimated exports. The bulk of cowpea exports have been channeled through unofficial or unrecorded trade. The pervasiveness of unofficial trade is partly due to the proximity of the Nigerian border to farm families for whom reporting to customs officials, often located far from their villages, would result in higher transport and other costs. Other constraints to participation in the formal trade are costly regulations and high transactions costs.

Many large to medium-sized traders once active in the cowpea export market ceased any exporting after 1976 when SONARA's monopoly was established. Only a limited number of politically influential large-scale traders were able to obtain export authorizations from local officials. Even though cowpea exports have been liberalized since 1984, the new policy was not properly publicized. At the time of the first phase field work, many farmers and traders were unaware that they could export freely. Hence, SONARA continued to possess a de facto monopoly over the formal sector. In recent months, however, the Centre National du Commerce Extérieur (CNCE) of the Ministry of Commerce has, together with the regional Chambers of Commerce, publicized the recent government measures liberalizing the cowpea market. During the second phase of the study it was clear that traders and farmers had a heightened awareness of their ability to freely market or export cowpeas.

Demand for Cowpeas in Nigeria. Estimates of the income elasticity of demand in Nigeria indicate that cowpeas have the lowest income elasticity among major food items. Holding prices as well as tastes and preferences constant, projection estimates show that cowpea consumption is likely to grow by slightly more than three percent per annum, at a rate slightly higher than projected population growth. These estimates run counter to the widespread belief in Niger that the market in Nigeria has unlimited potential for Niger cowpea exporters. A more significant expansion in consumption of cowpeas in Nigeria would, however, occur through (1) a fall in the price ratio of cowpeas relative to other food commodities, (2) technological progress in storage

and processing that reduces storage losses and labor-intensity of processing, and improves the storability and quality of cowpea products, and (3) increased consumer awareness of the nutritive value of cowpeas.

Even if demand for cowpeas in Nigeria expands at only 3-4% per annum, holding all other factors constant, a cowpea consumption gap could emerge by 1992 and deeper by 1997 if cowpea production does not expand in Nigeria and if it grows at a slow pace in Niger. Opportunities for Niger to expand exports will depend in large part on the extent to which cowpea production increases in Nigeria. Short of Nigerian government investment in cowpea research and extension and improved input distribution, price incentives will play a key role in the short run. As the naira depreciates relative to the cfa, the pressure will clearly be on Niger producers to increase their productivity and lower costs per unit of output and on marketing agents to assemble, store, transport and exchange cowpeas as efficiently as possible. Decision-makers in Niger can stimulate exports through research, extension and policy measures aimed at raising farmers' productivity and lowering marketing costs.

Study Findings and Policy Implications

A key study finding is that export taxes, restrictive licensing and export permit practices, and Nigerian import regulations add costs to cowpea marketing and limit entry and competitiveness, particularly in the formal sector. Reducing the costs of participating in the formal sector and eliminating barriers to entry will likely increase formal sector participation. A disadvantage of formal sector participation by Niger traders is the requirement of using formal sector financial institutions and hence carrying out transactions at the overvalued official exchange rate (naira to cfa). In addition, the Nigerian government restricts formal imports to two organizations, which likely confers considerable market power.

Removing the Export Tax. A central conclusion of the first-phase study was that the costs of the 20 cfa/kg. export tax on cowpeas greatly outweighed its benefits. Tax receipts from cowpea exports averaged less than 400 million cfa per year or approximately 0.6 percent of total GON tax revenue. These limited benefits were insignificant in comparison with the numerous costs incurred by producers and traders as a result of the tax, as well as Niger's reduced competitiveness in the Nigeria market.

The export tax raised the cost of cowpea trade in both the official and parallel markets. Its share in total marketing costs was estimated to be 20 percent for Niger traders exporting from Zinder to Kano in February 1988. Marketing costs incurred by

unofficial traders were also higher with than without the tax, the differential being equal (in principle) to the costs of eluding the tax. Removal of the export tax in October 1988 was a critical first step in increasing Niger's competitiveness in the Nigeria cowpea market. It will facilitate entry into the cowpea trade and the ability of traders to increase scale and achieve scale economies. Removing the export tax should also help to maintain Niger's market share in Nigeria's cowpea market. Although Niger is a key supplier, it is likely a price-taker in the Nigeria market. Hence, lowering marketing costs is imperative to maintaining Niger's competitiveness in Nigeria, especially as the devaluation of the Naira puts upward pressure on the naira prices of Niger cowpeas and is likely to squeeze returns to producing and marketing Niger cowpeas. Cutting marketing costs of Niger cowpeas will provide less of a stimulus to Nigeria producers to expand import-substituting production of cowpeas. Niger's market share in the Nigeria cowpea market is less likely to deteriorate.

The GON deserves to be commended for removing the export tax. This policy reform is consistent with the GON's long-run development strategy, which aims to remove market imperfections and promote exports in line with Niger's comparative advantage. Eliminating the export tax will likely prove, however, to be a necessary but not sufficient condition for promoting Niger cowpea production and exports.

Other Policy and Regulatory Reforms. Measures to facilitate entry into the cowpea trade and greater competition are especially important. Requesting permission to export cowpeas through official channels is a lengthy, transaction cost-laden process that favors urban, literate and generally larger-scale traders. The procedure is also an invitation to rent-seeking, opportunistic behavior on the part of government officials involved in approving export permits. Participation in the official export channel also requires payment of a sizeable patente or export license (483,000 CFA), which discourages small to medium scale traders from becoming legitimate, official participants and hence legal exporters.

Increasing Cowpea Productivity. INRAN/ICRISAT is developing improved cowpea varieties, which are more pest resistant and produce higher yields. By reducing in-field and post-harvest losses due to pests and by increasing yields, the potentially marketable output of cowpeas will expand and prices of Niger cowpeas in Nigerian markets will fall, ceteris paribus, making Niger cowpeas more competitive in Nigeria. Development of improved cultivars and agronomic practices is a high priority for increasing farmer productivity. In selecting cultivars, relatively more attention could be paid to consumer tastes and preferences. Since Nigeria is the main market for Niger

cowpeas, some market tests may need to be done in Nigeria. IITA could perhaps assist in such an effort.

Input Supply. Other than farmers residing in border villages with access to cheap Nigeria fertilizer, many farmers in Niger are not able to procure the full complement of improved production inputs. A low percentage of farmers use animal traction. It is interesting to note that INRAN-ICRISAT calculations of the farm-level economic viability of using improved cowpea varieties, fertilizer and pesticide assume that farmers have access to animal traction, which appears to be atypical. Furthermore, GON agencies responsible for input distribution, particularly the Centrale d'approvisionnement (CA), have performed poorly during the 1980s and their roles are being currently debated. A key strategic issue is the willingness of the GON to rely on cheap, subsidized Nigeria inputs. Given the proximity of most cowpea production zones to Nigeria and the porosity of the border, the GON's input supply policies and programs will need to reflect current and likely future cross-border realities. GON subsidization of high-cost, high-price input distribution does not appear to be a viable long-run strategy as long as Nigeria inputs are far cheaper and readily available. An important issue beyond the scope of this report is how widely available are Nigeria cowpea production inputs in Niger. This could best be answered by on-going surveys of rural households and markets in selected cowpea production zones. In the short-run, a rethinking of GON input distribution programs and policies is desirable. Policy consultations with the government of Nigeria may also be required to improve coordination of input supply between Niger and Nigeria.

Improved Cowpea Processing. Cowpea processing is an under-researched, little-understood area of investigation in Niger. The University of Nigeria at Nsukka, in collaboration with the USAID-supported Bean and Cowpea CRSP, has carried out applied research on cowpea processing in southern Nigeria for over five years. Experimental dehullers have been successfully introduced in several villages. Mechanically dehulled and ground cowpeas have been tested by consumers and judged acceptable. Whether this technology could be adapted to Niger is open to question. AMIS research on coarse grain processing in Senegal has shown that most mechanical dehullers and mills, particularly those installed in rural areas, are too oversized and underutilized for entrepreneurs to recover investment costs, and in many cases to even pay for replacement parts when breakdowns occur. Economically viable mechanized processing requires high levels of throughput and high utilization rates, adequate spare parts, fuel and repair services and distribution networks, consumer willingness and ability to pay for mechanized processing,

and sufficient local demand for cowpea products. Funding research on cowpea consumption patterns and preferences and current processing methods and costs would help USAID and the GON to better assess the potential viability of mechanized processing.

Other issues which critically affect the economic viability of mechanical processing are the incidence of import taxes on processing equipment, spare parts, fuel, and tools/materials used in the local manufacture of processing units. Value-added taxes on locally fabricated units can also raise equipment acquisition costs to prohibitive levels.

Over the long run, one way in which improved processing might make the cowpea trade more progressive would be in lowering export marketing costs by decreasing cowpea transport costs to distant Nigeria coastal markets. Further research on the shelf life of mechanically dehulled and ground cowpeas and storage/packaging requirements is needed to establish whether long distance transport of processed cowpeas is technically feasible, economically viable, and acceptable to Nigerian buyers.

Recommendations to USAID

Promoting the development of the cowpea subsector over the longer-term will require carefully sequenced policy reforms, institutional innovations and technology experiments and development. In the short term, USAID efforts will be best directed to encouraging policy and regulatory reform that promotes freer entry into the cowpea trade and competition in exporting cowpeas. Reviewing the current practices and performance of GON input distribution agencies and programs is also a high priority. Such an assessment will help better define a more feasible and productive role for these agencies.

While the GON continues to liberalize the cowpea trade through regulatory reform, the government and USAID should strongly consider funding further applied research on cowpea marketing, storage, processing and consumption. This research could and should be done in coordination with on-going INRAN/ICRISAT, INRAN/IFPRI, ASDG and other programs. USAID might also fund marketing system innovations, such as mechanized processing of cowpeas. Such an innovation might help to increase cowpea consumption in Niger at the margin and could make the cowpea export trade more progressive and Niger cowpeas more competitive in Nigerian markets by decreasing transport costs.

I. INTRODUCTION

1.1 Background

This rapid appraisal of cowpea marketing was prepared for USAID/Niamey by Abt Associates under the Agricultural Marketing Improvement Strategies (AMIS) Project. The work was carried out in two phases in Niger, Nigeria and Benin by a team of two agricultural economists, the first phase between April 27 and June 2, 1988 and the second between November 27 and December 21, 1988 during the marketing season. During the second phase, the team was joined by a food technologist who investigated the processing of cowpeas. This report incorporates the findings of both phases.

During the first phase, the study team spent five weeks examining the cowpea marketing system from the production zones in Niger to the export destinations in Benin and Northern Nigeria. Contacts with Niger officials and staff members of several development projects, as well as documentary and statistical review, were undertaken in Niamey during the first week of the study. Interviews with producers, cooperatives, traders and local officials were conducted in the departments of Maradi and Zinder during the second week. Investigation of the marketing systems in Benin* and Nigeria and their relevance to the Niger cowpea export market was undertaken in two separate visits to Cotonou and Northern Nigeria. During the second phase, follow-up visits were made to Niamey, Maradi, Zinder and Northern Nigeria. Four days were also spent in Lagos and Ibadan. The follow-up study provided further analysis of the cowpea marketing system in Niger and Nigeria and the constraints to, as well as the potential for, increasing exports to major consumption areas in Northern Nigeria and Lagos.

Cowpeas were selected for study by the USAID Mission in Niamey because of their importance in the rural economy of Niger and its agricultural export sector. The agricultural sector represents 50 percent of Gross Domestic Product and employs 90 percent of the population. Cultivable land in Niger represents only three percent of total land area. The southern belt, with a higher rainfall and a higher population density, accounts for much of the livestock production and nearly all production of agricultural crops. According to official GON statistics, cowpeas occupy more than 90 percent of total area allocated to cash crops in a given year and their importance in total area cultivated is second only to millet. With estimated exports exceeding two-thirds of

* The findings for Benin, which were negative as regards market potential for Niger cowpeas, appear in Annex I and in the first phase report, Rapid Appraisal of Cowpea Marketing in Niger: Phase I Report, AMIS Project, June, 1988.

production, cowpeas have played an increasingly dominant role in the rural economy and the agricultural export sector of Niger.

1.2 Study Objectives and Focus

The scope of work prepared by USAID/Niger calls for the preparation of a rapid reconnaissance study of the marketing of Niger cowpeas, which is to include an analysis of the economic impact of GON regulatory and fiscal policies on the export of cowpeas, and an assessment of the marketing potential for cowpeas in two neighboring countries: Nigeria and Benin. As such, the focus of the study is on marketing issues. The section on production does not go into detail on technical aspects of the growing of cowpeas, nor does it examine the role of cowpeas in farming systems. On the other hand, a section has been added on the processing potential for Niger cowpeas, a subject deserving of further study.

It should be noted that one of the key issues addressed in the Phase I report, completed in June 1988, was the export tax and its deleterious effect on the export of cowpeas. Subsequently, in October 1988, the Government of Niger removed the export tax. Investigation for this Phase II final report revealed that other fees and regulations remain as obstacles to free entry of smaller traders into the formal sector. Accordingly this report discusses these issues; the rationale for removal of the export tax is found in Appendix G.

1.3 Methodology

The AMIS Rapid Appraisal (RA) methodology was used in preparing the study. Rapid Appraisal may be defined as a broad overview of the organization and performance of the marketing system for a given commodity, designed to identify, under time and resource constraints, major system limitations and opportunities. It provides a cost-effective tool to generate knowledge about commodity marketing systems that may be used to improve system efficiency as well as to take advantage of unexploited or under-exploited opportunities. RA may also be used to identify knowledge gaps and further areas of applied research likely to have a high payoff.

The Rapid Appraisal approach becomes attractive when limited analytical information is available, since the alternative may be the initiation of a lengthy and costly data collection process. This was the state of affairs for the Niger cowpea sub-sector. Little hard data were available to describe such a large and vibrant economic activity, and the accuracy of what was available was questionable. To develop an overall understanding of the cowpea marketing system, the RA team first conducted interviews

with knowledgeable individuals. Informal questionnaires were then designed for cowpea traders and producers. Copies of these questionnaires (in French) are included as Appendix J.

During the field work, conducted in two phases, the RA team carried out interviews using the questionnaires with four cooperatives, forty traders, and twenty farmers. Marketing activities were also observed at every stage of the marketing chain. Field trips to Northern and Southern Nigeria and to Benin supplemented data gathering in Niger.

1.4 Organization of the Report

The report is organized into four parts plus appendices. Following the introductory material in this section, a review of all aspects of the Niger cowpea marketing system is presented in Part 2. Part 3 covers cowpea marketing and consumption in Nigeria, which is the major outlet for Niger cowpeas. Recommendations for future research are presented in Part 4. Appendices contain supplementary data on cowpea production, prices and nutritional value.

2. THE NIGER COWPEA MARKETING SYSTEM

2.1 Cowpea Characteristics

2.1.1 Nutritional Value

Due to its ecological adaptability, the cowpea is one of the most important food legumes in West Africa. Its contribution to the nutritional status of the population in this region is substantial (see Appendix D). The seeds are an important source of protein, calories and vitamins. Of these nutrients, protein has been most heavily emphasized. Cowpeas contain two to three times the protein of staple cereal grains and possess an amino acid profile which complements cereal protein. That is, cowpeas are rich in lysine, the essential amino acid most lacking in cereals, while cereals contain a slight excess of sulfur amino acids which are limiting in legumes. Cowpeas are also rich in the vitamins thiamin, riboflavin and niacin, as well as contributing to energy intake via their carbohydrate content. Cowpeas contain relatively less of the antinutritional factors common to legumes than do other species. This is illustrated by research which has shown that rats will grow slowly when consuming raw cowpeas, but will die within one to two weeks when given a diet of raw kidney or lima beans. Apart from heat-labile lectins and enzyme inhibitors, the stored protein and starch of cowpeas are relatively poorly digested in the raw seed, but become much more available when properly cooked.

In contrast with most West African countries where it is highly favored by the local population, cowpeas are produced in Niger primarily as a cash crop. Although its importance as a food crop is rather limited, a variety of cowpea recipes can be found. Cowpeas are used as rehydrated beans, fresh vegetables and cooked greens. The residual plant material is an important dry-season livestock feed.

2.1.2 Cowpea Varieties

Local varieties most widely used in Niger are: the danchiana, a small black-eyed white pea; the olaka, a chocolate color medium-large size pea; the dan-illa, a large white pea; the dantiada, a medium-sized white pea; and the bartatahi, a large red bean.

The danchiana, although widely produced and valued by producers for its early maturity and high yielding characteristics, is a less preferred variety due to its rather bitter taste. The dan-illa is valued for its sweet taste (thus making it easy to market) and its ability to produce hay for livestock feed.

Local names for cowpeas in some West African countries are listed in Appendix E.

2.1.3 Home Preparation

The dried seeds are consumed in two main forms. When used as a rehydrated cooked dry bean, the process necessarily involves soaking the dry seeds in water. Some consumers prefer a light-colored bean free of black specks, or "black eyes". After soaking, decortication is done by manual rubbing and floating off the seed coats from cowpea cotyledons. Coated or uncoated seeds are boiled and eaten alone or in combination with rice or cassava paste. They are often seasoned with peanut oil, butter or milk as well as local spices.

Cowpeas are also ground into flour. The flour is used to make wanan waké, a cowpea bread popular in Eastern Niger, particularly during the month of Ramadan. Pieces of cowpea dough are steamed and then seasoned with a local sauce (dan waké). The paste may be mixed with chopped onions and spices and made into deep-fried cakes (kékéna). The latter product is commonly sold by street vendors (see discussion below).

The fresh immature seeds are sometimes eaten as a vegetable, particularly in rural areas. These seeds are eaten boiled (doungouri fouloulanté), or ground and mixed with salt, pepper and a peanut paste (doungouri kadawa). The young shoots and tender leaves are sometimes boiled and eaten as a green vegetable accompanying millet cous-cous, a staple food dish.

The residual plant material is sun-dried and used as a hay in the dry season, particularly in more densely-populated rural or urban areas. Dried bundles of cowpea hay are readily purchased in urban markets.

2.1.4 Processing Potential

There is essentially no industrial-scale processing of cowpeas in Niger. At one time, the factory owned by the Société de transformation du mil (SOTRAMIL) in Zinder attempted to produce a cowpea flour for the market. According to the company's director, this product failed because it was made from undecorticated seed and lacked the desired functional and sensory characteristics for making food products. It might be noted here that the company's attempts to make fermented millet flour suitable for the production of the staple toah also failed, apparently due to poor product quality. The millet was over-fermented at one point, then became dark when dried in a diesel-fired dryer. The lack of expertise in food processing technology in Niger (there are no academic departments of food science, home economics or nutrition in the University) is a serious constraint on the development of any kind of food processing industry in the country. There is a Food Technology Section at INRAN, but it is apparently not addressing cowpeas at present.

In contrast to industrial processing, small-scale commercial processing of cowpeas is an important activity in towns and villages. By far the most commonly found product is the deep-fat fried cowpea paste product called akara in southern Nigeria, kosai in the Hausa regions of northern Nigeria and Niger and kékéna in western Niger. This product is mostly commonly produced by women who sell it to passersby in the marketplace and along the streets. It is also an important factor in the family diet of these vendors. This product is made by (1) soaking dry cowpeas and removing the seed-coats and eyes either by manual rubbing or pounding in a mortar, (2) grinding the hydrated cotyledons to a stiff paste either in a mortar, or a manual or mechanized mill, (3) diluting this paste with water, whipping to incorporate air and adding seasonings, and (4) cooking by frying in deep, hot oil. It is usually sold and consumed immediately after cooking. This product is especially popular for breakfast and as an afternoon snack, especially for school children.

2.2 Production Analysis

2.2.1 Role of Cowpeas in the Agriculture of Niger

The vast majority of Niger agriculture is rainfed. Irrigated agricultural production has, however, been extended to more than 10,000 hectares in the 1980's. In spite of an increased surface area placed in production during the last decade, only three percent of the total land area is under cultivation in a given year. Crop production, including cowpeas, is concentrated in the southern portion of the country, as can be seen on the map in Figure 1.

Cowpea production is particularly suited to the dry climate and the predominantly sandy loam soil found in the southern portion of Niger. Cowpeas are traditionally intercropped with either millet or sorghum, the principal food crops of Niger, although cowpea producers in Niger are increasingly realizing the higher yields obtainable from sole cropping.

Cowpeas are grown primarily as a cash crop, with an average of ten to fifteen percent of the total crop retained for family consumption. Some farmers indicate that they would market all of their crop if given the opportunity. Cowpea hay is an important joint product which is used for dry season fodder. In the Niamey Department, it is estimated that financial returns from hay sales exceed those from cowpea bean sales.

In recent years cowpeas have replaced peanuts (and to a lesser extent cotton) as the principal cash crop, becoming an important source of revenue for farmers. As indicated in Table 1, cowpea production had surpassed that of peanuts by 1975. From 1961 to 1965 area cultivated to cowpeas never surpassed peanut area by more than 50%. By 1983 over five times as much area was cultivated to cowpeas as to peanuts. More detailed information on these trends appears in Appendix F.

Table 1
Comparison of Cowpea and Peanut Production
(000 tons)

	<u>1960</u>	<u>1965</u>	<u>1970</u>	<u>1975</u>	<u>1980</u>	<u>1985</u>	<u>1986</u>
Cowpeas	43,685	47,320	75,710	218,500	268,735	115,332	292,935
Peanuts	150,313	278,060	203,460	41,700	126,125	8,478	N.A.

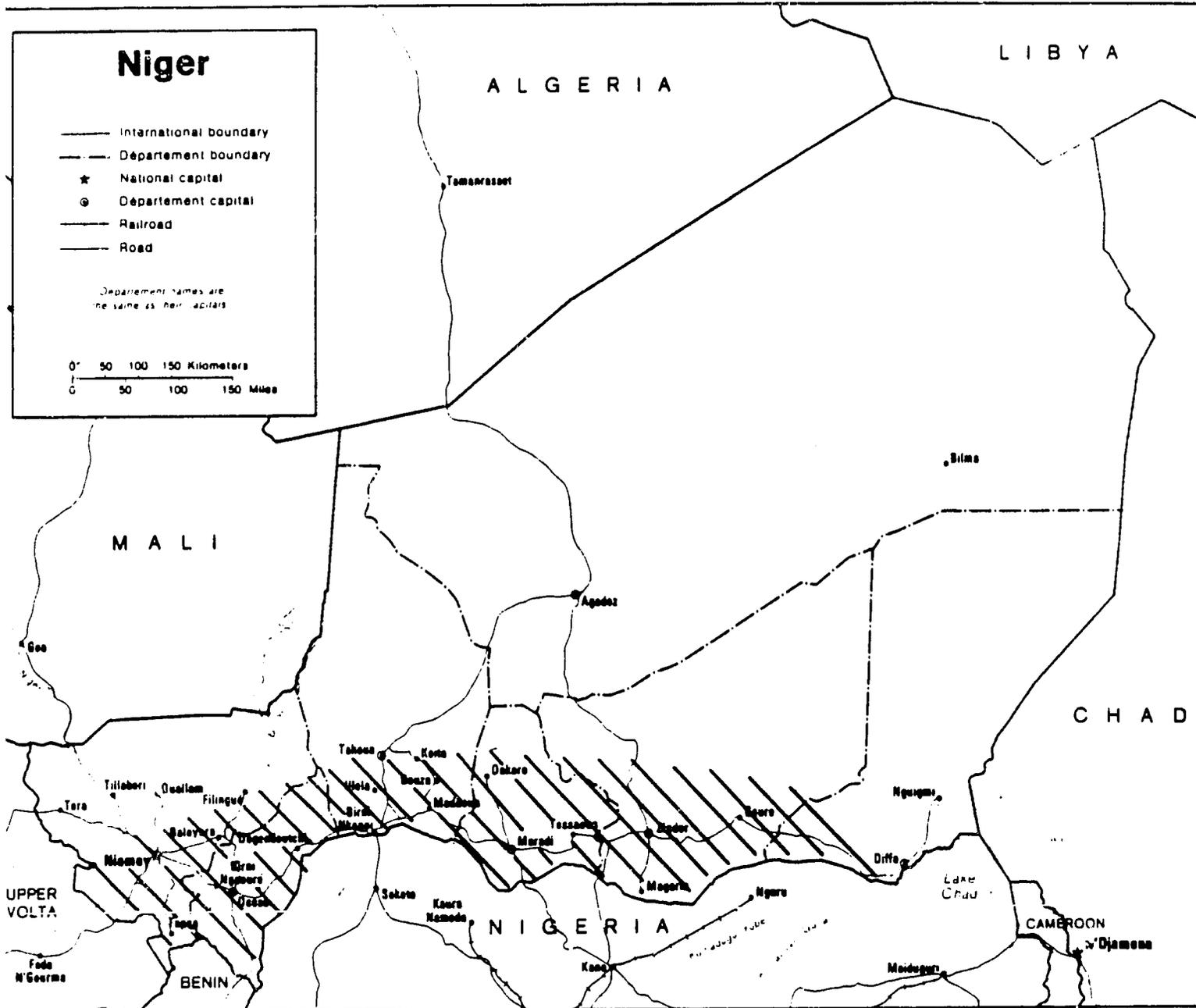
Source: Rapports annuels statistiques agricoles, années 1960-1985. République du Niger, Ministère de l'Agriculture, Direction des études, de la programmation et des statistiques.

The reversal in the status of peanuts and cowpeas as cash crops is vividly illustrated in the Maradi Department, which traditionally has accounted for more than fifty percent of total peanut production. In 1988 peanut production had dwindled to 2,431 tons, while in the late 1960's it had averaged over 100,000 tons. (See Appendix C for areas, yields, and production of major crops in the Maradi Department from 1968 to 1986.) By contrast, cowpea production benefitted from the increased export demand in Nigeria and an increase in cowpea prices relative to millet prices in recent years. Using unweighted average annual retail prices for Niamey, the cowpea/millet price ratio rose from 1.22 for the 1961-71 period to 1.54 for 1972-83.

There are several factors that have contributed to this shift. On the supply side, a downtrend in rainfall since the 1960s may have induced farmers to plant larger areas to cowpeas, a highly drought-tolerant crop. On the demand side, world prices for peanuts and peanut oil have generally declined since the 1960s. As a landlocked country facing very high transport costs, Niger became uncompetitive on the world oilseed market. At the same time, neighboring Nigeria's population has grown steadily since the 1960s, at an estimated 2.5% per annum between 1965 and 1980, and at 3.3% from 1980 to 1985 attaining the level of 99.7 million in 1985 (World Development Report, 1987). Per

Figure 1

Map Showing Cowpea Production Zones in Niger



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capita income also increased at an average annual rate of 2.2% from 1965 to 1985. Both population and income increases in Nigeria have expanded and will continue to expand market opportunities for Niger cowpeas. By comparison, the Niger market of 7.25 million offers less potential for growth of cowpea consumption.¹

2.2.2 Cowpea Production

Official GON statistics reported in Table 2 show that cowpeas rank second in area planted, exceeded only by millet. They are also third in overall production after millet and sorghum. Since 1975 total production of cowpeas has averaged over 250,000 tons in years of adequate rainfall, falling to less than 200,000 tons in years of low or poorly distributed rainfall. Although cowpea production more than tripled during the 1970's, reaching the level of 304,000 metric tons in 1979, production has stagnated during the 1980's, with the exception of an estimated record crop of 343,000 metric tons in 1988. (See Appendix A for total cowpea production in Niger, 1960-1987.)

Table 2

Area, Production and Yields of Major Food Crops

	<u>Millet</u>			<u>Cowpeas</u>			<u>Sorghum</u>		
	<u>000ha</u>	<u>000tons</u>	<u>Yield/ha</u>	<u>000ha</u>	<u>000tons</u>	<u>Yield/ha</u>	<u>000ha</u>	<u>000tons</u>	<u>Yield/ha</u>
1980	3,072	1,363	333	1,105	269	243	768	368	479
1981	3,038	1,314	432	1,198	282	235	982	322	328
1982	3,084	1,293	419	1,428	282	197	1,135	359	316
1983	3,136	1,298	414	1,609	271	168	1,107	355	321
1984	3,026	771	255	1,513	195	129	1,098	236	215
1985	3,169	1,450	458	1,566	115	73	1,142	329	288
1986	3,239	1,383	427	1,591	293	184	1,109	360	325

Source: Rapports annuels statistiques agricoles, 1986 and other years.

The Departments of Maradi, Zinder, Dosso and Niamey account for more than three-quarters of total cowpea production. Table 3 presents production by department together with percentages of total Niger production for each department for the years

1. The 1988 GON census revealed a population of 7.25 million, of which 6.139 million (or 84.7%) is rural and 1.11 million (15.3%) is urban.

1980-1987. The figures indicate a very large increase in production in Dosso in 1986/87, surpassing production in Zinder. Production data published by the Ministry of Agriculture vary widely from year to year and are of doubtful quality due to small sample size, missing data, and multiple reporting errors. Certain anomalies appear in the data: why, for instance, does cowpea production decrease significantly in 1985/86 in Dosso, Maradi, Niamey and Tahoua? Rainfall levels increased from 1984 to 1988 in all the concerned regions, save Tahoua, thus providing no clue. The statistical division of the Ministry of Agriculture could provide no reasons except sampling error. The methodology employed to estimate areas cultivated and yields per hectare tends to overstate production levels as agricultural agents often choose farmers close to large towns and on major roads, introducing a large degree of sampling bias. USDA/ERS claims that Niger grain area and production figures are overestimated and out of line with official grain production data reported by other Sahelian countries. Cowpea area and production may also be overestimated.

Field measurements are often undertaken without compasses and measuring tapes and are thus very rough estimates of area planted. Indeed when the degree of error is extrapolated to a regional or national level, it can become immense. Furthermore, figures for area planted, yield and production on a national level are obtained by extrapolating the sample data, using population data. There has been no national census in Niger since independence in 1960; data on population and farm size are therefore highly suspect.

As noted above, aggregate cowpea area and production have stagnated in recent years. It should be noted, however, that early estimates of 1988 production indicate a very large crop. The overall stagnation during the 1980s could be due to a variety of factors, including the softening of demand for Niger cowpeas in Nigeria. Oil revenues have decreased significantly since the late 1970s and early 1980s. Devaluations of the Naira have made Niger cowpeas more expensive in local currency terms relative to locally produced staple foods. On the supply side, farmers in Niger may have reached the practical limits of substitutability by the 1980s. That is, farmers could no longer shift land out of other crop production, notably grain and peanuts, to cowpea production. This assumes that most farmers are likely to be grain deficit and that they attempt to produce as much of their own grain as possible to satisfy household food security requirements.

Table 3
Cowpea Production by Department,
1980-1987

<u>Department</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>
<u>AGADEV</u>							
Production, MT	--	--	--	--	--	--	118
% of total production in Niger	--	--	--	--	--	--	--
<u>DIFFA</u>							
Production, MT	2,800	1,835	6,335	4,015	782	5,540	11,564
% of total	1	--	2	9	3	4	4
<u>DOSSO</u>							
Production, MT	35,050	45,738	20,895	34,530	44,260	18,055	99,552
% of total	13	16	7	13	23	16	34
<u>MARADI</u>							
Production, MT	106,470	131,773	92,607	73,400	61,352	6,827*	39,060
% of total	40	47	33	27	31	6	13
<u>NIAMEY</u>							
Production, MT	37,290	49,710	47,030	40,775	24,678	8,073	42,300
% of total	14	18	17	15	13	7	14
<u>TAHOVA</u>							
Production, MT	17,910	22,185	64,907	64,255	32,776	10,790	25,708
% of total	7	8	25	24	17	9	9
<u>ZINDER</u>							
Production, MT	69,215	30,376	49,970	54,374	30,995	66,047	74,633
% of total	26	11	18	20	16	57	25
TOTAL (ALL DEPARTMENTS)	268,735	281,617	281,744	271,349	194,843	115,332	292,935

Source: Rapports annuels statistiques agricoles, op. cit., as interpreted by the team.

* Possible recording error.

An analysis of rural households' decision-making, food security constraints, and cash needs is beyond the scope of this study, but examining the interaction of these factors is important for understanding farmer production incentives and cowpea supply response. Farmers' supply response in the aggregate (across all crops) may also be limited, because of an increasing scarcity of arable land and low levels of mechanization (i.e., animal traction), making it difficult to expand area under cultivation. Other factors that may have negatively affected cowpea production were SONARA's statutory monopoly from 1975 to 1984 and the inability of the undercapitalized informal sector to move a greater volume of exports.

2.2.3 Production Systems: Major Characteristics and Constraints

Present cowpea production is a land-intensive system characterized by low yields, which can largely be attributed to the use of minimal amounts of fertilizers and insecticides/pesticides, unimproved seed varieties, random plant spacing, and low plant densities.

Cowpeas are usually planted after millet and sorghum and typically intercropped with them or (less frequently) with manioc and corn. Dry-season cowpea production on plains near riverbanks, in low-lying areas (bas-fonds), and on irrigated perimeters is becoming increasingly important. Dry season production is less susceptible to attacks by insects and diseases. Cultivation is essentially done manually with the short-handled hoe, the daba, and the hiler, a long-handled weeder. Animal traction is rare.

High labor requirements at planting, weeding, and harvesting necessitate the hiring of wage labor. Farmers indicated the need to hire additional labor for periods of up to ten days each during planting, weeding, and harvesting periods. Some of the revenues earned from cowpea production are used to pay for wage labor during these peak periods. Harvesting can take up to eleven days for a typical plot of 1-5 hectares. After the pods are harvested, the plants are bundled and stored or sold as hay for animal feed during the long, harsh dry season.

The widely varying annual rainfall and rainfall distribution patterns during the agricultural season are major determining factors which render cowpea production -- and all dryland agriculture in the Sahelian Zone -- a risky venture. The development of drought resistant varieties has helped to reduce farmers' risks.

Twenty cowpea producers were interviewed during the two phases of the study. Farmers interviewed had considerable experience with growing cowpeas, averag-

ing more than ten years' experience. All farmers interviewed expressed a desire to increase production. Producers interviewed cultivated between one to four hectares of cowpeas, with yields ranging between 125 to 267 kgs. per hectare and averaging 188 kgs. per hectare.

Table 4 summarizes the major characteristics of the farming systems encountered.

Table 4

Characteristics of Present Cowpea Production Systems in the 1980s

Average Total Production:	248,000 tons (1980's mean) 115,000 - 343,000 range
Planting Dates:	Rainy season: After millet and sorghum Dry season: February
Intercropped:	With millet, sorghum and (rarely) corn, + manioc, although many cowpea producers are increasingly cultivating cowpeas as a sole crop.
Area Cultivated:	1.43 million ha. (1980's average); second in importance after millet.
Yields:	182 kgs./ha (1980's mean); range = 74-243 Kgs./ha.
Major Production Areas:	1. Zinder 2. Maradi 3. Dosso 4. Niamey (mostly fodder production) 5. Tahoua
Storage:	Minimal, most producers sell immediately after the harvest to meet family cash needs.
Use of Cowpea Revenues:	Primarily to purchase cereals, but also clothing; revenues also used to pay wage labor.

Source: Rapports annuels statistiques agricoles, and Rapid Appraisal Survey.

Mixed and Solo Cropping

As discussed above, cowpeas have traditionally been intercropped with millet or sorghum. The farmers feel that intercropping reduces risk; if one crop or area of a field does not receive enough rain or suffers from insect or disease attacks, perhaps another part of the field will succeed. Further, they believe that intercropping of cowpeas maximizes land use and returns to labor invested in land preparation, and provides

beneficial effects to subsequent millet and sorghum crops through nitrogen fixation by cowpea plants.

Studies¹ have shown that intercropping is relatively advantageous in terms of profit maximization and risk aversion when traditional practices are used, that is, unimproved varieties and minimal amounts of fertilizer and insecticide. Nonetheless, farmers are increasingly experimenting with sole cropping of cowpeas. More than one-third of the farmers interviewed were sole-cropping cowpeas due to the increased yields obtainable.

Input Use

Low use of inputs, such as improved seeds, fertilizer, insecticides, pesticides and agricultural equipment is due in part to the disorganization of the input supply system. Credit for agricultural inputs has not been available to farmers since the disappearance of the National Agricultural Credit Agency (CNCA) in the early 1980's. The future of the Centrale d'approvisionnement (CA), the parastatal currently responsible for importing and distributing agricultural inputs for sale throughout the country, is highly uncertain. Possible options under discussion are for the CA to supply inputs only to irrigated zones, or for the CA only to handle donor-supplied inputs. There has been much discussion concerning the transfer of the CA to the National Cooperative Union (UNC) but this would not improve distribution as the UNC has neither the funds nor the expertise to undertake a national input supply distribution system. SONARA, the parastatal which had a legal monopoly on cowpea marketing and export until the mid-1980's, never provided improved seeds, fertilizer, insecticides, or other inputs to farmers.

A fundamental constraint to development of parapublic input distribution in Niger is the ready availability of inexpensive Nigeria supplies in border areas. As long as these subsidized inputs are available in Niger, GON efforts to supply similar products are likely to be cost ineffective and unnecessary.

Seeds

Much seed research has been undertaken in the last twenty years in West Africa by the International Institute of Tropical Agriculture (IITA) and the International Center for Crop Research in the Semi-Arid Tropics (ICRISAT) on developing high yielding, drought and pest-resistant cowpea varieties. IITA's research concentrated initially

1. David W. Norman, An Economic Survey of Three Villages in Zaria Province, Samaru Misc. Paper #37, Ahmadou Bello University, Zaria, Nigeria, 1972.

on germ-plasma collection, evaluation and maintenance, and breeding for insect resistance. More recently, IITA has emphasized developing early maturing, improved plant types with desired seed quality.

The high yielding and disease resistant varieties developed by IITA in the 1970's had smooth seed coats and brown seeds, which were not accepted by farmers who preferred large white seeds with rough testa.¹

In the 1980's IITA, in conjunction with INRAN, the National Agricultural Research Institute in Niger, developed some early maturing seed varieties (60 days) with high yield potential and resistance to insects and diseases. These varieties are currently being extended to farmers. One of the varieties (TVX-3236) being tested at IITA and ICRISAT fulfills the above stated criteria. The leaves are lost at maturity, however. Hence no fodder is available for animal feed, making it most undesirable to local farmers.

TN88-63, is a 70-day variety suitable for areas with annual rainfall of 300-400 millimeters. It has been often criticized for its failure to produce large quantities of hay, and for its less desirable taste. TN36-64 is a 70-day variety for areas with an annual rainfall of 400 to 500 millimeters while TN4-69 is a 90-day variety recommended for areas with an annual rainfall of 400-500 mm. TN98-63, a 90-150 day spreading variety, is recommended only for higher rainfall zones. CB-5, widely introduced in Niger in 1987-88, proved unsuccessful as the California-developed variety was not drought resistant and proved highly susceptible to pests and insects (see R. J. Bingen et al., 1988, for a discussion of the CB-5 experience in Senegal).

Among new varieties currently being tested by ICRISAT are the TN578, which is a dual-purpose red bean variety providing good fodder and bean production, provided farmers follow recommended production techniques with respect to proper crop density, plant spacing, and adequate fertilizer and insecticide doses. Farmers like TN578 because they claim it is more insect-resistant during storage. The newly developed varieties, which have been made available to farmers in Niger, have not yet proven superior to local varieties, with the exception of TN578 in some production zones.

Fertilizer

Cowpeas, like all other leguminous plants, are nitrogen-fixing. Cowpeas have large phosphorous and potash requirements, however. Given the low level of these

1. The testa is the hard external coating or integument of a seed.

minerals in Niger soils, fertilization is needed in order to obtain good yields. It is estimated that applications of 30 to 40 kg. of phosphorous (P_2O_2) and 25 to 30 kg. of potassium (K_2O) are required per hectare to ensure good crop growth.¹

Among farmers informally interviewed during the RA survey, approximately one-third use no fertilizer on cowpeas. Among those who do use fertilizer, applications ranged from 30 to 200 kilograms per hectare, with mean use of about 50 kilograms. Phosphorous and supersphosphate are the most widely used fertilizers, purchased from the CA, URC, cooperatives, fertilizer banks or local traders. The amount of fertilizer sold by the CA has diminished due to price increases which followed the reduction and/or removal of government subsidies. Farmers complained about the high cost of this non-subsidized fertilizer (prices cited varied between 35 and 65 cfa/kg.). Villages far from major towns reported higher prices.

Sales of cheaper subsidized fertilizer imported from Nigeria by private traders appear to have increased in 1988. At the time of the study it cost 14 to 16 Naira per 50 kg. bag (14-16 cfa/kg.), but farmers stated that it is only available in those zones close to the border. The sale of fertilizers by cooperatives has increased substantially, although farmers prefer to buy in Nigeria or from private traders selling cheaper Nigerian fertilizer, if possible, as the cooperatives charge a 15 cfa per kg. mark-up. Some fertilizer prices at the time of the survey are shown in Table 5.

Table 5
Fertilizer Prices in
Maradi and Zinder, May 1988

<u>Source</u>	<u>Price Per kg. (in cfa)^a</u>
Credit (UNC)	60
Private Traders	45-65
CA	35
Obtained from Nigeria	14-16

Insecticides and Other Inputs

Cowpeas are especially vulnerable to insect attacks, which can reduce yields up to 80 percent. The cowpea plant is vulnerable to pests from the seedling to the

1. B. B. Singh, et al., General Guide for Cowpea Cultivation and Seed Production, IITA, not dated.

a. Prices cited by cowpea producers in six villages in Maradi and Zinder Departments.

harvest stage, as well as in storage. Major insect pests are aphids, flower bud thrips, and storage bruchids. Other bacterial, viral, and fungal diseases may also infect the plant at various stages. Insect attacks can be greatly diminished through treatments of insecticide at the flowering and pod development stages.

Farmers regard the unavailability of agricultural chemicals as a major constraint on cowpea production. They state that they use small amounts of insecticides and fungicides, other than those provided by the Agricultural Service spraying program, and that such spraying is neither sufficient nor timely. Some producers purchase insecticides from Nigeria at 16 CFA per kilogram, although most complain of the general unavailability of insecticides.

Importance of Cowpea Hay

Cowpea hay is important as livestock feed. The hay is an important input for livestock feeding (embouche bovine) in the Niamey area and is used to feed small ruminants in urban areas. Cowpea hay is transported from the farmgate by camels to Niamey from within a forty mile radius. Camels can carry 70 to 80 bundles. (The bundles are approximately five feet by two feet in size, although they vary widely in volume and weight.) The individual leading the camel usually makes one trip per day during the dry season. During the rainy season, hay is scarce and most hay traders work as farmers during that period. The purchase price of hay varies from 125 CFA per bundle after the harvest to 500 CFA during the rainy season. Traders usually gain a margin of 25 to 100 CFA per bundle, with the higher margin applying during the rainy season (May-September).

In the cowpea producing zones surrounding Niamey, cowpeas are grown more for sale as hay than for the peas themselves. In the major producing zones elsewhere in the country, cowpea hay is of no commercial importance as a cash crop. Most farmers do not sell hay but use it to feed their own livestock. Some farmers leave the cowpea straw in the field for animals to graze on, which serves the dual purpose of feeding the livestock and providing organic fertilizer for the field.

Production Constraints

Major constraints to expanding cowpea production have been discussed above and may be summarized as follows:

1. the susceptibility of cowpea plants to insects and diseases;
2. the lack of improved seed varieties appropriate to local conditions;

3. the unavailability of modern inputs in zones distant from Nigeria;
4. the high labor requirements at peak periods during the growing season;
5. failure to follow recommended cultural practices (proper plant density and spacing); and
6. lack of proper storage techniques (see Section 2.7.2).

2.2.4 Adoption of New Techniques

Researchers and extension experts maintain that farmers would be willing to adopt new techniques and improved farming practices if these were shown to be cost effective under farm conditions. If farmers are certain that a market is available for their cowpeas, they will be willing to invest in increased input use (and perhaps animal traction) if these practices produce positive net revenues.

Improved technologies in cowpea production are presently being tested in Niger by INRAN (Farming Systems Research Division), the USAID-funded Agricultural Production Support Project (APS), and ICRISAT. On-farm tests are being conducted by both ICRISAT and the APS Project. APS results indicate that farmers achieve higher economic returns in fields intercropped with millet. Higher yields and increased returns are observed in fields monocropped with cowpeas, through introduction of new varieties (TN578), prescribed doses of fertilizer and two treatments of insecticides, and proper plant densities and crop spacing. ICRISAT is currently conducting tests using two-year crop rotations. During the first year an improved cowpea variety (TVX-3236) is planted with recommended fertilizer and insecticide doses, and using improved practices and increased plant densities; millet is planted during the second year.

It is expected that millet will benefit from the residual nitrogen fixed by the previous cowpea crop. If properly managed, on-farm cowpea yields range from 600 to 1000 kg./ha. (On-station yields range from 1.0 to 1.5 tons per hectare.) The ICRISAT experiments are cost-effective only if animal traction is used (AMIS emphasis).¹

2.2.5 Use of Cowpea Revenues

Cowpeas are an important source of revenue for Niger farmers. For many farmers cowpeas and livestock are the principal sources of cash income. Other sources of income are agricultural wage labor payments, sales of gathered wood and hauled water, and remittances from urban areas. Income from cowpeas is important in meeting

1. Personal communication, Dr. R. Bonny N'tare, cowpea breeder, IITA/ICRISAT.

rural households' grain requirements. In years of good cereals production, cowpea revenue can be used to invest in livestock, purchase clothes and other "luxury" items, pay taxes, and fund weddings and social ceremonies.

By most reports, the vast majority of cowpea production is sold. Farmers retain a sufficient amount as the next season's seed. A small quantity, if any, is reserved for household consumption.

The extent to which cowpea revenue is reinvested in agriculture is not known, but this is an important issue for further research. It is likely that most purchases of agricultural implements and chemical inputs are funded from cowpea sales, even though the use of improved farm equipment, notably animal traction, fertilizer and pesticides is limited. If cowpea yields and farmer sales of cowpeas increased, farmers might buy more and better agricultural inputs. This would depend in part on farmers' expenditure patterns and investment preference structure, however. Other pressing cash needs might take priority.

2.3 Demand Analysis

2.3.1 Domestic Consumption

In contrast to information on production and prices, data on consumption of cowpeas in Niger are almost nonexistent.¹ Two methods are generally used to estimate domestic consumption. It can be obtained by subtracting exports from production and allowing a percentage for retained seeds and handling losses. However, in the absence of quantitative information on exports (see next section), this method could not be utilized. Another alternative is to extrapolate from results provided by household surveys. Unfortunately, only three such surveys were found. The first two surveys cover the city of Niamey and the third the Department of Diffa. Qualitative information revealed that while the Niamey surveys were reasonably representative of urban areas, cowpea consumption in Diffa did not reflect observed consumption patterns prevalent among the rural population. Consumption characteristics in rural areas were, therefore, investigated on a qualitative basis from interviews with a limited number of farmers, rural women, and knowledgeable individuals in the Departments of Zinder, Maradi, Dosso and Niamey. The results of this investigation are summarized in Table 6.

1. Although variable, consumption of legumes is generally higher in Africa than in the industrialized countries. An extensive compilation of 97 surveys in 50 areas of Africa in 1964 found that consumption was 0-10g/day for 25 percent of the population, 10-50g/day for 50 percent, 50-150g/day for 23 percent and more than 150g/day for 2 percent. (Akroyd and Doughty, 1964.)

2.3.2 Consumption Patterns

Based on the above estimates and on team observations, yet without access to detailed food expenditure and income data disaggregated by income group, cowpea consumption in Niger is likely to be characterized by low demand, low price elasticity, and low income elasticity of demand.

Table 6

Cowpea Consumption in Niger

	<u>Rural</u>	<u>Urban</u>	<u>Total</u>
Production (000 Tons) ^a			240
Population (000) ^b	6.139	1,111	7,250
Consumption as % of Total Production ^c	15	1.2	16.2
Per Capita Consumption (kg./year) ^d	7	3	6.2
Quantity Consumed (000 tons) ^e	43	3.3	46.3
Percent of Total Consumption	93	7	100

a Average for 1980-1987 period, calculated from data in Rapports annuels des statistiques, Ministère de l'Agriculture, Niamey.

b Calculated from data in World Development Report, World Bank, 1986.

c For rural areas: present survey.

For urban areas: urban population x per capita consumption of 3 kg. from Etude sur la consommation des céréales dans la ville de Niamey, Mariama Gamatié, June 1987. Per capita consumption in Niamey was also estimated at 0.059 kg./week or 3 kg./year in a survey carried out by La Instituto Italo Africano in July-August, 1988. The survey was based on the consumption patterns of 776 families during a one-week period (Source: personal communication, Vincenzo Caputo, Instituto Italo Africano.)

d For rural areas: 15% of total production divided by rural population.

e 15% and 1.2% of total production for rural and urban areas respectively.

Low Demand

At 6.2 kg. per capita, cowpea consumption is less than 3% of the official estimate for cereal consumption of 200 to 240 kg. per capita. Demand for cowpeas is low in both rural and urban areas. Consumption in rural areas, where demand is higher, is estimated to be only 15% of production. Owing to the high prices of cowpeas relative to other food crops, resulting from high demand in neighboring countries, farmers are

inclined to sell most of the harvest to satisfy their cash obligations. Millet, sorghum and maize are consumed in preference to cowpeas, and also because coarse grains are generally a cheaper source of calories for rural households. Given low levels of rural income in Niger, it is quite likely that many rural households produce cowpeas to benefit from favorable cowpea/grain arbitrage.

Urban areas account for only an estimated 7% of all cowpeas consumed in Niger. This reflects both the low per capita consumption -- less than half that in rural areas -- and the low level of urbanization in Niger. Rice and millet are the preferred cereals for most urban dwellers.

The low consumption level for cowpeas has led the government of Niger through the Association des femmes nigériennes (AFN), or Nigerien Women's Association, to organize food competitions and awareness campaigns throughout the country to expand the various utilizations of cowpeas. These campaigns have also aimed at explaining the functional roles of cowpea starch and protein and their contribution to improved nutritional status. These efforts are, however, unlikely to succeed in any major way given the difficulty of changing consumption habits, the status of cowpeas as a primary cash crop, and their high prices relative to other food crops.

Likely Low Price Elasticity and Negative Income Elasticity of Demand

Price elasticity of demand for food in Niger is estimated at 0.7.¹ This elasticity is most likely lower for cowpeas given their insignificance in the local diet and their low share in total household expenditure. Comparison of urban and rural consumption patterns also indicates that cowpea consumption may be negatively correlated with income. Cowpeas' status as an inferior good² and their low price elasticity suggest that domestic demand for this crop is unlikely to increase significantly in the near future.³ This result indicates that exports must continue to play a vital role in the Niger cowpea market.

1. Source: SEDES, Enquête budget de consommation au Niger, 1962.

2. A good is normal or inferior as its income elasticity is positive or negative.

3. It should be emphasized, however, that inferiority and normality and, therefore, income elasticity vary over different ranges of income. Cowpeas may be an inferior good for one family over a particular range of incomes. It may be a normal good over still another range of incomes. Furthermore, the classification of goods as inferior or normal depends upon the price ratio. At one price ratio, a good may have a substantially different income elasticity from the income elasticity of another price ratio. Therefore, it is well to remember that inferiority and normality are not inherent properties of the good themselves, for income elasticities depend upon consumers' preference patterns, the price ratio and the range of incomes.

2.3.3 Exports

Estimates of cowpea exports from Niger are detailed in Table 7. Since 1976, total annual exports have averaged 164,000 metric tons and have amounted to more than two-thirds of total production. It is striking to note that the Société nigérienne de l'arachide (SONARA), the parastatal which monopolized the export market for cowpeas in Niger between 1975 and 1984, marketed on average less than 12 percent of estimated total exports in the 1976 to 1987 period. In 1980 and 1981 only one percent of total cowpea production was marketed by SONARA.

Almost 90 percent of the cowpea trade has remained unrecorded due to false invoicing and smuggling. Smuggling has been facilitated by the overwhelmingly long and porous borders with neighboring countries, particularly with Nigeria, the principal destination of Niger cowpea exports. Much of the unrecorded trade is also due to the proximity of the Nigerian border to farm families for whom reporting to customs officials, often located far from their villages, would result in higher transport and transaction costs.

Official records show that Nigeria is the sole importer of Niger cowpeas. Field work conducted by the study team in Niger, Northern Nigeria and Cotonou, Benin indicates that unofficial exports are also channeled almost exclusively to Nigeria. The cowpea market in Nigeria is examined in Part 3 of this report. The export tax in force on Niger cowpeas until October 1988 had a major effect on export trade. An analysis of this subject appears in Appendix G. An analysis of the cowpea market in Benin is found in Appendix I.

Table 7
Estimated Cowpea Exports from Niger, 1976 to 1987
 (000 metric tons)

<u>Year</u>	<u>Production^a</u>	<u>Official Exports^b</u>	<u>Consumption^c</u>	<u>Estimated Total Exports^d</u>	<u>Estimated Unofficial Exports^e</u>
	(000 tons)				
1976	216	19	35	149	130
1977	207	49	33	143	94
1978	271	4	44	186	182
1979	304	19	49	209	190
1980	266	49	43	183	134
1981	275	4	44	190	186
1982	272	4	44	187	183
1983	271	15	44	186	171
1984	195	12	32	134	122
1985	115	0	19	79	79
1986	293	31	47	202	171
1987	209	37	34	144	107
Average	239	19	39	164	145

a Ministère de l'agriculture et de l'environnement, Rapport annuel des statistiques agricoles, 1987.

b Information provided by the Ministère du commerce, Département du commerce extérieur. These figures represent mainly SONARA's exports.

c 16.2 percent of total production (see Table 6).

d Total production minus 15 percent allowance for seeds and losses minus consumption.

e Total exports minus official exports.

2.4 Price Analysis

Prices play an important role in agricultural development in signaling to farmers where gross returns in production are likely to be highest and to traders periods for which storage is likely to be most profitable. This section will examine price behavior and trends for Niger cowpeas, using limited available data (primarily a Niamey retail price series). Some attempt will be made to relate Niger cowpea price seasonality to price seasonality in Nigeria, a market which appears very well-integrated with Niger cowpea production zones and assembly/redistribution markets.

2.4.1 Changes in Real and Relative Prices

Real cowpea retail prices in Niamey increased 45.1% between 1970-72 and 1981-83. This was a much larger increase than for millet (14.4%), but comparable to the increase for sorghum (42.7%). (See Appendix B for selected price data on Niger cowpeas).

Nominal retail cowpea prices in Niamey ranged from 22% higher on average than millet prices from 1961 to 1972, to 54% higher from 1973 to 1983, and to 111% higher on average from 1984 to 1987. This upward shift in relative prices was driven primarily by increased demand for Niger cowpeas in Nigeria and shorter supplies on local Niger markets. Cowpea area and production expanded more rapidly over the 1961 to 1986 period than millet area and production. Hence, the cowpea supply curve shifted out farther than the millet supply curve during this period. The significant outward shift in cowpea demand, stimulated primarily by increased export demand for cowpeas in Nigeria, appears to have been greater than the outward shift in cowpea supply, contributing to the rise in cowpea prices relative to millet prices.

2.4.2 Relationship Between Official and Market Cowpea Prices

Berg compares official cowpea purchase prices, as decreed by the GON from 1970 to 1984, with estimated open market prices (see Berg, 1986). From 1975 to 1984 the official prices represented SONARA offer prices. After 1984 pricing of cowpeas became market determined, although SONARA continued to offer a fixed, pan-seasonal producer price. The open market producer prices are calculated as 65% of the Niamey retail price. As a percentage of the estimated open market prices, official prices varied from a low of 36% in 1980 to a high of 89% in 1970. The mean percentage was 64%. Given the disparity between official and open market prices, it is no surprise that SONARA was unable to procure any more than an estimated 34% of total estimated cowpea exports in even its best year. Paradoxically, SONARA's highest levels of exports,

49,000 metric tons in 1977 and 1980, came during the years when the relationship of the official price to the open market price was least favorable (43% and 36%). Berg offers no explanation for this anomaly.

2.4.3 Cowpea Price Seasonality in Niger and Nigeria

Food crop prices typically follow a seasonal pattern, falling to seasonally low levels shortly after the harvest and rising steadily to the next harvest. In semi-arid West Africa, where there is little irrigation and one relatively short rainy season followed by a long dry season, one would expect the seasonal pattern to be pronounced. The expected seasonality for cowpeas is one of seasonally lowest prices in November-December, immediately after the harvest, and seasonally highest prices during the soudure months of July-September, just before the next harvest.

Using the "Seasons" subroutine of the MSTAT software program, we have generated the grand seasonal index (GSI) for Niamey retail cowpea prices, as shown in Table 8 and plotted in Figure 2.¹ The GSI is constructed using the ratio-to-moving average technique with 25 years of monthly retail price data. The market year is defined as beginning in November and ending in October. The GSI shows, on average, the months during which cowpea prices are seasonally highest and lowest. The index is constructed so that the sum of the monthly price indices equals 1200 (12 months x 100).

Since the GSI uses moving averages to calculate the monthly indices, it is important to emphasize that there is considerable variability in price behavior across years. The magnitude of that variability is indicated for particular months by the corrected standard error (CSE). The CSE represents a confidence interval around the index figure reported for each month. The range of prices, expressed in terms of the GSI, is depicted graphically in Figure 3. As an illustration of the concept of a price range, the monthly index for August is 119.1, suggesting that cowpea prices are on average 19.1% above the mean across all months during the market year. But the CSE of 31.0% shows that the value (price) for August can vary by as much as thirty-one percentage points. The August value lies within plus or minus 31 percentage points of its mean value in 7 out of 10 years.

1. MSTAT is a microcomputer program for the design, management and analysis of agronomic research experiments which contains benefit-cost and price seasonality subprograms. MSTAT was developed by Michigan State University in collaboration with the Agricultural University of Norway.

Table 8
Grand Seasonal Index
 For
Niamey Retail Cowpea Prices

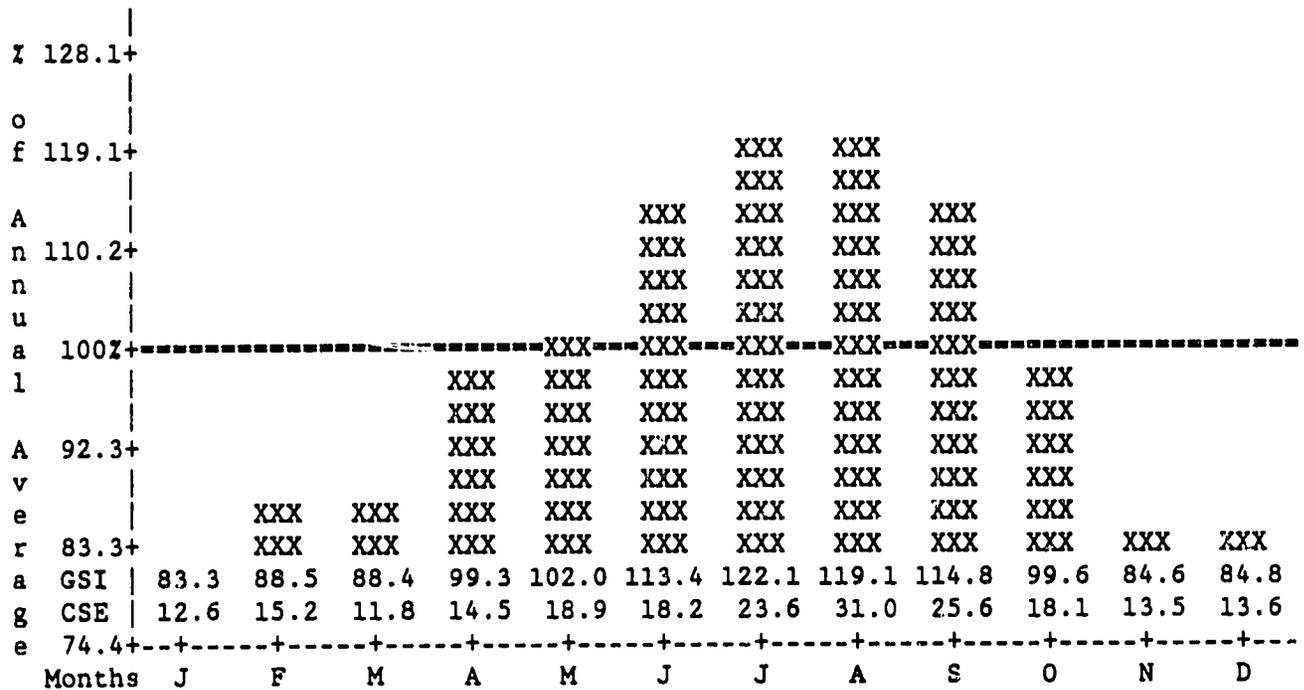
<u>Month</u>	<u>Average Seasonal Index</u>	<u>Standard Error</u>	<u>Grand Seasonal Index</u>	<u>Corrected Standard Error</u>	<u>GSI + CSE</u>	<u>GSI - CSE</u>
JAN	82.92	12.48	83.31	12.60	95.91	70.71
FEB	88.13	15.07	88.55	15.21	103.76	73.33
MAR	88.00	11.65	88.41	11.76	100.17	76.66
APR	98.86	14.32	99.33	14.45	113.78	84.87
MAY	101.49	18.68	101.97	18.86	120.83	83.12
JUN	112.82	17.98	113.35	18.15	131.50	95.20
JUL	121.54	23.36	122.11	23.58	145.70	98.53
AUG	118.57	30.68	119.13	30.97	150.11	88.16
SEP	114.30	25.32	114.84	25.56	140.40	89.28
OCT	99.09	17.97	99.56	18.14	117.70	81.42
NOV	84.21	13.36	84.61	13.49	98.09	71.12
DEC	84.43	13.47	84.83	13.60	98.42	71.23

The higher the CSE, of course, the greater the variability of prices in any given month. This is an especially important consideration for cowpea traders, who make storage decisions based on their expectations of seasonal price behavior. If there is a great deal of variability in seasonal price patterns, then average price behavior is likely to be of secondary importance for traders with reasonable levels of risk aversion. If the risks of incurring losses in any given year are too high, then traders will be discouraged from storing cowpeas for long periods. Typically high losses of cowpeas in storage, and irregular availability of phytosanitary products, tend to accentuate the risks of inter-seasonal storage.

As shown in Figure 2, cowpea prices are seasonally highest in Niamey during the June-September period, with the peak falling in July-August. There is a distinctive seasonal trend, stronger than for cowpea prices in the southwestern Nigerian state of Ogun (see Table 9). Cowpea prices are seasonally lowest in the November-January period, and remain seasonally low until March. Seasonally low prices during the five-month period after the cowpea harvest suggest that farmers or traders do store cowpeas for relatively short periods of up to 3-4 months and sell from storage. Storage losses are probably acceptable during the cool dry season post-harvest months in Niger. In April cowpea prices rise significantly (on average); this likely corresponds to a marked

Figure 2

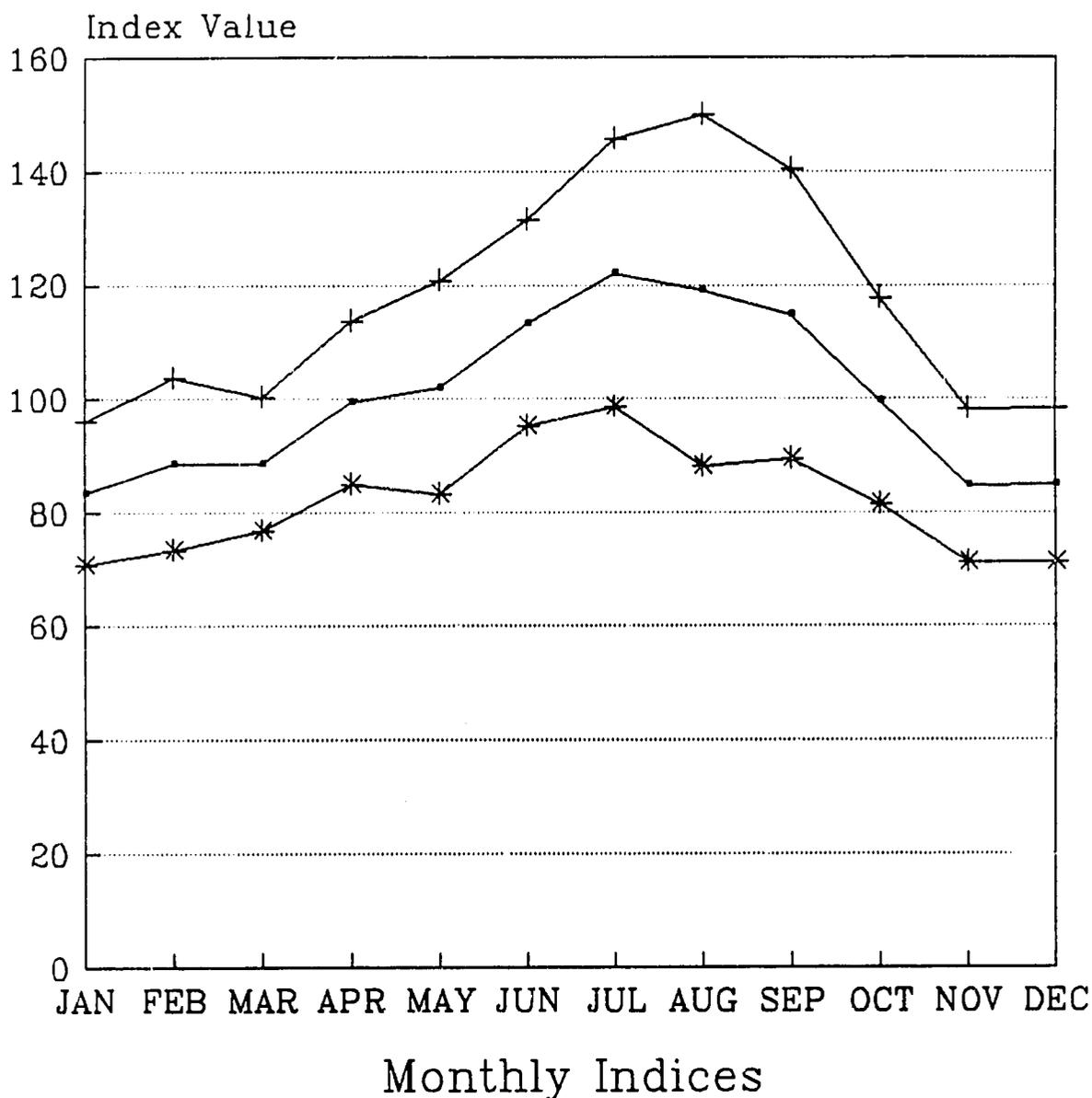
GRAPH OF THE GRAND SEASONAL INDEX
FOR
NIAMEY RETAIL COWPEA PRICES



GSI. IS THE GRAND SEASONAL INDEX
CSE. REPRESENTS THE CORRECTED STANDARD ERROR

THE 100% LINE IN THE BAR CHART REPRESENTS THE AVERAGE OF 90.896 CURRENCY UNITS OVER THE 25 YEAR PERIOD OF ANALYSIS OF COMMODITY PRICE DATA. THE MONTH INDEX VALUE INDICATES BY HOW MANY PERCENTAGE POINTS EACH MONTH'S VALUE LIES ABOVE OR BELOW THE ANNUAL AVERAGE.

Figure 3 Price Variability Associated with GSI for Niamey Retail Cowpea Prices



—•— GSI —+— GSI + CSE —*— GSI - CSE

GSI means grand seasonal index.
CSE means corrected standard error.

dropping off in farmer and perhaps trader sales from storage. The hot dry season begins in late February or early March in Niger, which tends to exacerbate storage problems. By April it is likely that most, if not all of Niger's marketed surplus of cowpeas has been shipped to urban markets or exported to Nigeria.

Using a comparable technique for calculating cowpea price seasonality, Durojaiye and Aihonsu (1988) show that seasonality is less pronounced in Ogun state of southwestern Nigeria. This appears to be indirect evidence of the RA finding that cowpeas are generally not stored for periods of longer than a few months in Niger (but exported in large quantities to Nigeria). The large-scale exportation tends to heighten seasonality of cowpea prices in Niger markets. In contrast, southwestern Nigeria appears to receive a relatively steady flow of cowpea shipments from northern and central Nigeria producing areas and from exporting countries such as Niger, Cameroon and Chad.¹ Cowpeas appear to play a more significant role in the diets of consumers in southern Nigeria than in Sahelian diets, although this finding merits more empirical research. It is also likely, and informal interviews with Nigerian traders appear to confirm this, that significant quantities of Nigerian and imported cowpeas are stored commercially in Nigeria and released later in the market year when prices rise. Commercial storage tends to moderate seasonal price rises in Nigeria, unlike Niger, where there is no evidence of long-term storage by private traders.

Another important factor that limits seasonal increases in cowpea prices in southern Nigeria is the timing of the cowpea harvests in Nigeria. The two principal cowpea crops are an early smaller crop called Danzafi or Wushiki, harvested in August-September, and the major crop called Farin Wake (Hausa for white bean), harvested in November-December, as in Niger. A third, relatively minor cowpea crop, Sa Baba Sata, grown in the Fadamas, comes to market in January and in May.² The spacing of the three cowpea harvests in Nigeria likely dampens seasonal price rises in major Nigerian markets. As shown in Table 9, the price index does not rise to a higher level than 110, compared to 122 in Niamey. Given the seeming weakness of demand for cowpeas in Niger, it is unlikely that there are any significant reversals in cowpea flows between Niger and Nigeria during periods of the year following harvests of secondary cowpea crops in Nigeria. Weak urban demand for cowpeas in Niger, low purchasing power of

1. Cowpeas may also be shipped to Nigeria from Benin and Burkina Faso, although we have no evidence to substantiate this.

2. Fadamas are river banks which retain enough moisture to allow for cultivation of some crops during the dry season, once the river recedes.

Table 9

Seasonal Price Indices for Cowpeas in
Niamey, Niger and Ogun State, Nigeria

<u>Month</u>	<u>Niamey Cowpeas (1961-85)</u>		<u>Ogun State Nigeria (1979-84)</u>			
	<u>Index</u>	<u>CSE</u>	<u>Red/Brown Cowpeas</u>		<u>White Cowpeas</u>	
	<u>Index</u>	<u>CSE</u>	<u>Index</u>	<u>SE</u>	<u>Index</u>	<u>SE</u>
October	99.6	(18.1)	96	(9)	96	(5)
November	84.6	(13.5)	88	(4)	92	(4)
December	84.8	(13.6)	90	(7)	88	(8)
January	83.3	(12.6)	86	(5)	88	(4)
February	88.5	(15.2)	94	(9)	92	(8)
March	88.4	(11.8)	94	(9)	96	(11)
April	99.3	(14.5)	102	(8)	98	(8)
May	102.0	(18.9)	108	(4)	104	(9)
June	113.4	(18.2)	106	(5)	104	(5)
July	122.1	(23.6)	106	(5)	110	(0)
August	119.1	(31.0)	110	(0)	110	(7)
September	114.8	(25.6)	108	(8)	110	(10)

- Notes:**
1. The index is constructed such that the annual mean over the period (1961-1985) is equal to 100.
 2. CSE is corrected standard error. SE is standard error.

Sources: Niamey index: Computed from data in République du Niger, Ministère de l'Agriculture, Direction des Études, de la Programmation et des Statistiques. Rapports annuels des statistiques agricoles, various years.

Nigeria indexes: Reported in Bamidele O. Durojaiye and John O. Y. Aihonsu, "Market Integration and Seasonal Prices of Staple Foodstuffs: A Case Study of Ogun State, Nigeria," Food Policy, November 1988

Niger rural consumers, and high transport costs would tend to discourage reverse flows. Empirical investigation is necessary to verify this, however.

2.4.4 The Magnitude of Cowpea Price Changes Across Seasons

Updating analysis done by Berg (1986), it is clear that the magnitude of changes in nominal cowpea prices between harvest and the hungry season (soudure) vary greatly from year to year in Niger. The harvest price is calculated as a three-month average for October, November and December, while the soudure price is a three-month

average for June, July and August in the following year. Over a 26 year period (1961/62-1986/87), the percentage change from harvest to soudure is broken down as shown in Table 10.

Table 10

Magnitude of Percentage Change in Cowpea Prices,
Soudure Compared to Harvest Season, 1961/62 - 1986/87

<u>Percentage Change</u>	<u>No. Years</u>
100%	4
+50-99%	6
+25-49%	6
+0-24%	5
< 0%	5
Mean Percentage Change	48.4
Standard Deviation of Percentage Change ¹	52.7
Coefficient of Variation of Percentage Change ²	1.1

In comparing the magnitude of harvest to soudure price changes for several key staple crops from 1961/62 to 1983/84, Berg shows that the average percentage change is greatest for cowpeas (49%), second largest for millet (38%), third largest for sorghum (30%) and smallest for rice (7%). Cowpeas also have the greatest number of years of negative change, as shown in the < 0% category. This suggests that long-term storage (eight months) of cowpeas is risky. In 5 of 26 years nominal purchase prices paid by traders were higher than nominal sales prices they received eight months later (negative percentage change). In 5 of 26 years nominal sales prices were less than 25% higher than nominal purchase prices. In these years typically high storage costs and losses for cowpeas would likely lead to negative net returns to traders. In 16 of 26 years returns to storage ranged from slightly positive to attractively high. In the capital-scarce Niger context, it is not surprising that Niger cowpea traders are unwilling to perform the inter-seasonal storage function when the probability of incurring losses in nominal terms is .38 (i.e., in 10 of 26 years). Taking interseasonal inflation into account makes long-term storage even less attractive.

1. The standard deviation is an absolute measure of dispersion around the mean.
2. The coefficient of variation is a relative measure of dispersion equal to the standard deviation divided by the mean.

2.4.5 Estimated Costs and Returns of Cowpea Storage

Table 8 and Figure 2 show that cowpea prices increase by an average of 46.6% between January, when prices are seasonally lowest, to July, when prices are seasonally highest. The 1.47 ratio of pre-harvest to post-harvest prices is below 1.6 (meaning prices rise seasonally by 60%), above which price spreads are considered high.¹

In a competitive and efficient market, the interseasonal price rise is just equal to the costs of storage. These include:

1. the interest charges on, or opportunity cost of, working capital tied up in the form of stored commodities;
2. storage losses, including the costs of shrinkage and quality deterioration during storage;
3. the costs necessary to provide and maintain or rent the physical facilities for storage;
4. normal returns to management and labor; and
5. risk-bearing; e.g., the risk that the price might unexpectedly decline and that the product might have to be sold at a price below its value at the time it was placed in storage plus real storage costs.

Table 11 shows storage costs for eight months under various pairs of storage losses and interest rates (plus other storage costs, which can be added to the monthly interest rate). An examination of this table reveals that the increase in cowpea prices in Niger is quite reasonable. This increase is, for instance, consistent with a monthly interest rate of one percent (an average that has prevailed in Niger in recent years for national private enterprises), five to ten percent storage losses, and a three percent monthly provision for rent on storage facilities, pest control costs, normal returns to management and risk-bearing. Alternatively, the price spread corresponds to storage losses of approximately 15 percent, a monthly interest rate of one percent and other storage costs of two percent per month.

1. See Timmer, et al., Food Policy Analysis, Baltimore: Johns Hopkins University Press, 1983. The authors give an example of a large price spread in the case of maize prices in Ghana. See Southworth et al. (1979) for details.

Table 11
Estimated Cost of Storage for Eight Months at
Various Rates of Interest and Storage Loss

Interest rate per Month	Storage loss (percent)				
	30	20	15	5	None
0	30	20	15	5	0
1	54	35	27	14	8
2	67	46	38	23	17
3	81	58	49	33	27
4	96	71	61	44	37
5	111	85	74	56	46
6	128	99	88	68	59

- Notes:**
1. The cost-of-storage figures in the body of the table are percentages of the purchase value of the amounts left for sale at the end of eight months.
 2. Calculations assume interest is compounded annually.

Source: V. Roy Southworth, "Food Crop Marketing in Atebubu District, Ghana," Ph.D. dissertation, Stanford University, 1981. In Peter Timmer, W. P. Falcon and S.R. Pearson, Food Policy Analysis. Baltimore: the Johns Hopkins University Press, 1983, see pp. 174-176.

Another way to examine potential returns to cowpea storage is to examine changes in nominal prices between month of sale and the month that cowpeas are put in storage, and the effective interest rate of return from storing cowpeas bought at the beginning of the market year (November) and sold from storage during the remaining months of the market year (December-October). Since monthly CPI data for Niamey are not available as a deflator, we examine nominal returns to storage here.

Summary statistics for changes in nominal prices during the market year and calculated interest rates of return are shown in Tables 12 and 13. Since the monthly price index is highest on average for July, the magnitude of the nominal price difference from the beginning of the market year is higher than for all other months. The interest rate of return is also most attractive if cowpeas are sold from storage in July. Note that this calculation does not net out storage costs (and losses). On average, significant and attractive increases in both nominal prices and interest rates of return fall in April, June and July, corresponding to sale from storage after 5, 7 and 8 months respectively. Gross returns to storage decline after July, eight months after the beginning of the market

year (November). Yet storing cowpeas for periods of 5-8 months leads typically to high storage losses, which would cut deeply into net returns to storage.

Since nominal price changes are negative from November, the month we have defined as the beginning of the market year, to December, only slightly positive from November to January, and negative in as many years as positive from November to February, it makes more economic sense to buy cowpeas in the December-February period rather than immediately after harvest. The possible disadvantage of doing this is that the quality of cowpeas on the market may deteriorate steadily after harvest, so that traders buying cowpeas in, say, January or February, might buy infested and degraded cowpeas which would store poorly and result in high physical losses. Clearly, the storage question requires better empirical information and more rigorous analysis before definitive conclusions can be drawn. Nevertheless, the Niamey retail price data suggest that returns to storage are likely to be attractive for Niger traders who have the working capital to tie up for long periods (5-8 months), access to phytosanitary products, and the willingness and ability to risk "playing" the Niger cowpea market. At the same time, it is important to emphasize that the high level of seasonal price variability across years, as indicated by high corrected standard errors, shows that cowpea storage entails significant risks.

Table 12
**RAW STORAGE PRICE CHANGES FOR
 NIAMEY RETAIL COWPEA PRICES**
 (in nominal CFA terms)

YEAR	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
Statistics for 1961-1985												
Mean	0.0	-1.5	1.6	7.0	10.1	21.9	25.5	36.9	55.0	41.5	42.9	23.1
S.D.	0.0	12.1	11.9	20.1	22.4	37.4	45.7	58.8	91.6	60.6	67.6	34.2
Low	0.0	-41.0	-18.0	-17.0	-21.0	-13.0	-7.0	-12.0	-7.0	-8.0	-20.0	-31.0
High	0.0	22.0	39.0	67.0	67.0	124.0	183.0	189.0	303.0	207.0	241.0	111.0
Rises	0.0	11.0	11.0	12.0	14.0	18.0	20.0	21.0	21.0	21.0	21.0	18.0
Falls	0.0	11.0	11.0	12.0	8.0	5.0	3.0	2.0	3.0	3.0	3.0	4.0

Statistics for Last 5 Years												
Mean	0.0	-6.5	16.2	20.0	34.8	70.8	81.0	117.8	195.8	121.4	131.0	56.6
S.D.	0.0	28.7	45.8	57.8	80.9	149.6	174.6	243.1	408.7	243.8	269.9	115.9
Low	0.0	-41.0	5.0	-17.0	-14.0	-13.0	-7.0	-12.0	22.0	-8.0	-2.0	-31.0
High	0.0	14.0	39.0	67.0	67.0	124.0	183.0	189.0	303.0	207.0	241.0	111.0
Rises	0.0	3.0	5.0	3.0	4.0	4.0	4.0	4.0	5.0	4.0	4.0	4.0
Falls	0.0	3.0	0.0	2.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0

Note : The series begins JAN, 1961 and represents a NOV, 1961 to OCT, 1962 market year.

Note : The table categories "Rises" and "Falls" indicate the number of years over the period of analysis during which nominal prices rise or fall from November, defined as the beginning of the market year, to the month in question.

Table 13

Interest Rate of Return from Storage

for

Niamey Retail Cowpea Prices

YEAR	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
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Statistics for 1961-1985

Mean	0.0	1.8	2.7	11.1	12.3	27.2	30.3	51.3	67.5	61.9	55.2	33.5
S.D.	0.0	17.5	21.8	28.3	26.6	32.4	32.6	56.7	71.6	70.1	57.4	42.7
Low	0.0	-29.2	-29.2	-28.6	-26.2	-10.7	-14.3	-28.6	-12.3	-6.3	-35.1	-25.0
High	0.0	36.7	71.4	78.6	64.3	96.0	126.2	207.1	243.7	280.0	180.7	152.0
Rises	0.0	11.0	11.0	12.0	14.0	18.0	20.0	21.0	21.0	21.0	21.0	18.0
Falls	0.0	11.0	11.0	12.0	8.0	5.0	3.0	2.0	3.0	3.0	3.0	4.0

Statistics for Last 5 Years of above Table

Mean	0.0	-1.9	9.7	14.1	24.0	46.4	52.7	78.3	128.4	81.0	89.1	38.5
S.D.	0.0	39.3	55.1	68.2	70.0	90.8	95.6	151.1	227.4	174.5	160.6	103.0
Low	0.0	-16.9	2.3	-7.6	-6.2	-5.8	-3.1	-5.6	10.3	-3.8	-0.9	-14.6
High	0.0	11.8	20.0	34.4	52.1	82.1	126.2	158.8	243.7	173.9	180.7	93.3
Rises	0.0	3.0	5.0	3.0	4.0	4.0	4.0	4.0	5.0	4.0	4.0	4.0
Falls	0.0	3.0	0.0	2.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0

Note : The data series begins JAN, 1961 and represents a NOV, 1961 to OCT, 1962 market year.

Note : The table categories "Rises" and "Falls" indicate the number of years over the period of analysis during which nominal prices rise or fall from November, defined as the beginning of the market year, to the month in question.

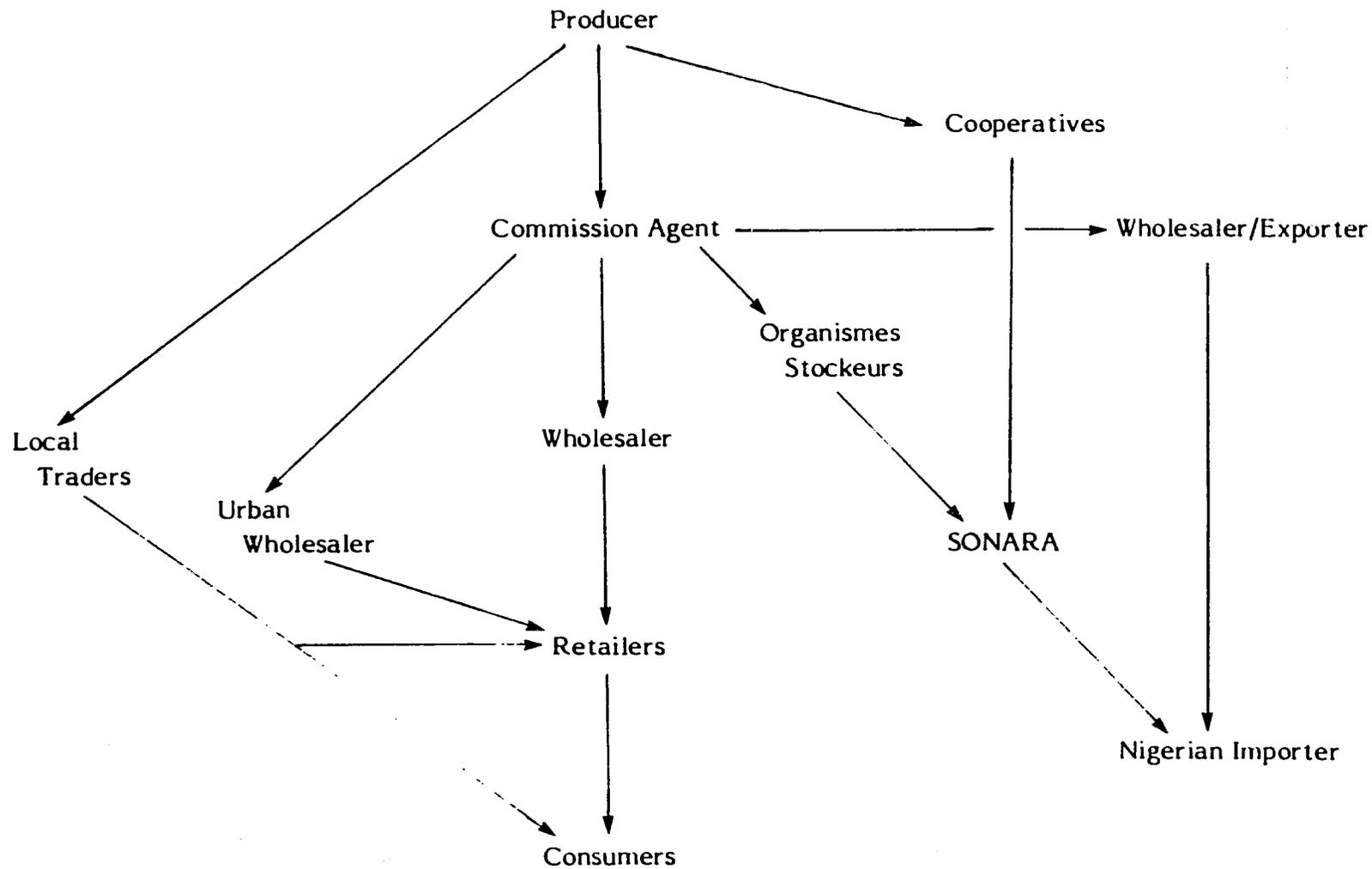
2.5 System Organization

The Niger cowpea market is characterized by a multiplicity of actors, including producers, local traders and/or commission agents, wholesalers and/or exporters, cooperatives, the parastatal marketing organization SONARA, organismes stockeurs (primary purchasers for SONARA), retailers and consumers. The four marketing channels for cowpeas are comprised of the local market channel, the internal market channel, the "SONARA" market channel and the private (predominantly informal) market channel (Figure 4).

The local channel concerns cowpea production which is sold at village markets by producers to local traders, then to consumers. In the internal market channel, cowpeas are sold through commission agents to wholesalers who market them through retailers or to other wholesalers in urban areas (mainly Niamey) for internal consumption. The SONARA channel sends cowpeas either through cooperatives which act as agents for SONARA, or through commission agents who assemble the product in villages for wholesalers who in turn act as assembly agents (organismes stockeurs) for SONARA. SONARA then exports the cowpeas to Nigeria. The most important channel in terms of volume handled is the private export channel which includes private traders in both the small formal and larger informal sectors. Here producers sell either directly or through commission agents to wholesaler/exporters, usually in small quantities. These wholesaler/exporters, who may be either from Niger or Nigeria, then arrange export of the cowpeas to Nigeria. The SONARA channel may be considered the major official export marketing channel, whereas the vast majority of exports pass through the informal or unofficial export channel, in which cowpeas are exported by Niger wholesaler/exporters or by wholesaler/importers from Nigeria.

Figure 4

Market Distribution Channels for Niger Cowpeas



2.5.1 Producers

Producers are the most numerous participants in the cowpea subsector. Many farmers seek to market most, if not all, of their production. Farmers interviewed sold to cooperatives, local traders, SONARA and to local women who use the cowpeas to make flat cakes (gallettes), which they retail locally. Producers in towns close to the Nigeria border sell to Nigerian traders who attend local markets. Some producers transport their cowpeas to sell in local markets using donkey carts or by carrying cowpeas in head loads if the quantity is small.

2.5.2 Village Intermediaries: Local Traders/Commission Agents

Local traders reside year round in the production zones and buy in small quantities from farmers in their own villages and surrounding areas. The crop is in some cases purchased, in cash or in kind, well before harvest. The purchased cowpeas are sold in rural markets to rural retailers or other intermediaries. Some village traders sell directly to consumers from their homes or a stand in the local market.

Due to their knowledge of the production area, and their strong ties with producers, local traders are also used by large wholesalers, or by Nigerian importers, to collect cowpeas in villages and local markets. When acting as assemblers, they receive a fixed fee for handling of the product (500 CFA/sack for a 9,000 FCFA sack in December 1988).

2.5.3 Wholesaler/Exporters

The wholesaler/exporter marketing channel handles the great majority of Niger exports to Nigeria. These traders purchase cowpeas either directly from producers or through village assemblers (commission agents or local traders) and are responsible for all costs related to product assembly such as transportation, labor and purchase of sacks. The wholesaler/exporter also provides all of the funds necessary for exporting the cowpeas from Niger to Kano, including assembly, loading, transporting and unloading. If they are in the formal market, they pay all taxes, license fees and other expenses, i.e., road taxes and bribes (cadeaux) incurred en route. The majority of wholesaler/exporters export through the informal market and thereby do not pay taxes or a licensing fee. They have to pay road taxes and bribes, however. There is also a cost associated with the confiscation of their product, and the payment of fines if they are apprehended by customs authorities.

In some cases Nigerian importers travel to Niger to purchase cowpeas in large quantities from wholesalers in Zinder or Maradi or in small quantities directly from

village markets. However, as either an export license or a "special authorization" to export cowpeas is required and granted only to Niger nationals, the title to the commodity is transferred to importers only after crossing the Niger border.

The wholesaler/exporter class includes the large, politically influential Niger traders from Maradi and Zinder who receive authorization from the prefet to export cowpeas during the period of the SONARA monopoly. These large traders were also able to make "arrangements" with proper authorities so that they paid little if any of the export tax. It appears as if these politically important large-scale traders earned oligopolistic profits and not surprisingly, preferred the continued imposition of the export tax, which acted as a barrier to entry to other would-be wholesaler/exporters who do not possess sufficient capital to finance large-scale cowpea exporting. The major constraint faced by the medium-sized and smaller traders is the high initial investment requirement. The elimination of the export tax should permit greater participation by these traders in the market, and reduce the margins earned by the large exporters. However, the high annual cost of fulfilling official requirements to obtain export licenses (483,000 CFA = \$1,610) serves as an additional barrier to entry for medium-sized and small traders.

The informal sector, which exports the great majority of Niger cowpeas, moves only small quantities. Cowpeas are traded across the border on donkeys, camels or carried on heads. The informal sector includes traders from both Niger and Nigeria.

Wholesaler/exporters from Niger purchase agricultural commodities such as millet, sorghum, corn, manioc, and cassava in Nigeria for resale in Niger. By doing this traders avoid transferring the Naira to Niger where it has a low sale value. Goods from Nigeria sold in Niger are reported to bring high net returns.

2.5.4 Wholesalers

Niger wholesalers purchase locally large quantities of cowpeas, and sell to retailers and other wholesalers. Wholesalers, usually based in urban centers of Niger, such as Maradi, Zinder or Niamey, often store cowpeas for four to six months, with attendant costs and risks. To avoid tying up all their available capital in cowpea inventory, traders deal with other commodities for which turnover is quicker. While some wholesalers specialize in cowpeas, most handle other commodities, such as millet, sorghum and maize.

2.5.5 Cooperatives

The Union nationale de coopératives (UNC), formerly the Union nationale de crédit et de la coopération (UNCC), was created in 1962 with the objective of providing administrative support to cooperatives. A cooperative comprises up to ten Groupements mutualistes villageois (GM). Delegates from the cooperatives form the Union Locale de Cooperatives (ULC). Higher levels of the cooperative structure are the Union sous-régionale de coopératives (USRC), the Union régionale de coopératives (URC). UNC field agents have record-keeping responsibility for credit allocation, input delivery and cooperative marketing.

Cooperatives are licensed to collect cowpeas on a commission basis for SONARA. In addition to organizational, socio-cultural and institutional constraints, the lack of working capital has been a serious limitation to cooperative activity. To induce commercial banks to receive a cooperative clientele, USAID has supplied a guarantee deposit at the Banque Internationale pour l'Afrique Occidentale (BIAO) against loans made to the cooperatives participating in the project. Under the Agricultural Sector Development Grant (ASDG), the National Cooperative Business Association (CLUSA) has been responsible for defining amounts and maturities of the loans and selecting cooperative beneficiaries. Unfortunately, the overwhelming majority of cooperatives in Niger do not have the legal status necessary to apply for bank loans, nor do they have the funds necessary to guarantee the loan.

Loans have been primarily used to finance cereal marketing campaigns, although in the 1988-89 marketing season thirty-two CLUSA cooperatives in the Maradi and Zinder Departments received loans, totalling more than 13 million cfa, to purchase and market more than 9,000 tons of cowpeas. Cooperative leaders have visited with Nigerian wholesalers on a recent trip to Kano with the hope of negotiating contracts with the Nigerians during 1989. Once the bank loan is obtained the money is disbursed to the GMs as a function of what each can deliver. Prices are first negotiated with buyers and set at a level which enables the cooperatives to realize a profit. The profit is then used to purchase inputs or set up a cooperative store, or it is deposited at the local bank for future use.

Even though the cooperatives' participation in the cowpea trade has been relatively insignificant;¹ the possibility exists that they will play a larger role in provid-

1. Only 14,000 tons or four percent of total cowpea production has been marketed by the cooperatives in 1988, i.e., from the 1987 harvest. (Source: CLUSA/Niamey).

ing market outlets to members. However, constraints on expanded participation include (1) cooperatives' vulnerability to erratic buying and payment by SONARA, their principal client, and (2) their inability to organize their own export programs or even explore markets outside their immediate area due to lack of physical capital (e.g., trucks and storage facilities) and market expertise. The question also arises whether the cooperatives will be able to sustain their marketing activities once the USAID guarantee deposit program is discontinued.

2.5.6 SONARA

The parastatal SONARA has had a legal monopoly of all secondary cowpea marketing and exporting since 1975. SONARA provides neither inputs (seeds, fertilizer, insecticides) nor any extension services to cowpea producers. In 1984, the cowpea market was liberalized, theoretically allowing private traders and cooperatives to export cowpeas. In spite of the liberalization of the market, SONARA continues to dominate the official export market. As in the past, cooperatives and private traders (organismes stockeurs) licensed to collect cowpea production for SONARA continue to play a preponderant role. Cooperatives and organismes stockeurs purchase cowpeas from producers at a fixed price, and assemble the production for SONARA, for which they receive a commission of 250 CFA per sack.

2.5.7 Retailers

Retailers, usually located in stalls in marketplaces, sell cowpeas by the tiya, a local measure equal to 2.5 kilograms. The retail trade is characterized by a multiplicity of actors due to the small amount of capital required to enter the market and the lack of alternative employment opportunities. As retailers do not maintain large volumes of cowpeas and they turn over their stocks rapidly, their risks are relatively low.

2.6 System Infrastructure

The periodic (usually weekly) markets in Niger are major centers of economic activity, especially in smaller towns and rural areas. It is estimated that there are 2,500 periodic markets in Niger where farmers carry their produce to sell and buy other goods.

2.6.1 The Transport System

Niger's terrain is mostly flat with no major physical barriers. The road network is concentrated along the southern border, where the majority of the population are located and most economic activity takes place. There are approximately 7,000 km of

paved, unpaved and rural roads in Niger. Paved roads cover more than 2,500 kms and provide strong links between major production areas and trade centers.

The transport system is based on an active and diversified trucking industry. The Société nationale des transports nigériens (SNTN) has approximately 500 trucks, of which half are engaged in freight transport. The other half is owned by private traders and small truckers. Rural areas are served by "bush taxi" (taxi-brousse) and light trucks, although some areas remain inaccessible during the rainy season. Nigerian cowpea importers play a significant role in the Niger freight transport system. As cowpea imports are restricted to licensed importers and Nigerian truckers have developed strong ties with customs officials in Nigeria, cowpeas are shipped there almost exclusively on Nigerian trucks. Pedestrian and animal transport is also quite prevalent, serving as the major means for farmers and smaller traders to evade the licensing fees and (prior to October 1988) the export tax.

2.6.2 Storage Facilities

Most researchers working on cowpeas in Niger who were interviewed by the RA team agreed that storage is one of the major problems in the cowpea production and marketing system. The most important storage problem is insect infestation. Early maturing peas harvested before the end of the rainy season may also mold. Insect infestation begins in the field, and continues in storage as the pests are transported along with the cowpeas into storage facilities. Cowpeas needed for household consumption, for seed and for dry-season sales-for-cash are stored on the farm. The amounts reserved vary widely. Farmers in need of cash at harvest time often sell their entire crop. Others may reserve from ten percent to nearly all their production until prices rise before the next rainy season.

Existing village storage techniques range from traditional to modern and depend on whether the village is associated with a cooperative and on the means of the individual farmers. Modern storage facilities are in evidence in villages both adjacent to and distant (by 50 km) from hard-surfaced roads. They consist of concrete buildings in which shelled, bagged cowpeas are stored. Phostoxin (aluminum phosphide, a highly toxic fumigant) tablets were commonly used in the bags at a rate of 1 tablet per 20 tia (50 kg.) of seed (20 tablets/mt). In the U.S., the recommended rate for grain is 60-180 tablets per 1000 bushels (2-7 tablets/mt). It is not certain that the tablets are the same size, but are thought likely to be so by a U.S. retailer who was consulted. Other synthetic insecticides, including orthine (an organosphosphorous compound with relatively low acute toxicity) may be mixed with cowpea seed in the bag.

At the other extreme, traditional storage of cowpeas involves placing unthreshed pods in storage bins made of woven grass or mud, and placing leaves of either neem or a local shrub (gonda) among them. These plants contain a natural insecticide/repellent. Alternatively, the pods may be drenched with water. The insect-detering mechanism of this last method is not clear. One might speculate that (a) the water washes off the insects, (b) that it induces molding of the pods so that either the heat or toxic metabolites drive away pests, or (c) that seed hardening is induced by the increased moisture, discouraging insect damage. However, the effects of seed hardening on insect infestation (if any) is not known.

The magnitude of cowpea losses during storage is difficult to assess. Village farmers who stored seed in the traditional ways generally claimed that losses were small, though some cited losses of up to 100 percent. Cowpea seeds which were examined during this survey showed relatively little insect damage, but it was soon after harvest. It seems probable that the use of insect killing or repelling chemicals (whether natural or synthetic) and improved storage facilities, such as concrete buildings or even improved mud/clay rather than woven grass storage bins, would decrease losses.

Cowpea traders who store seed for an extended period use relatively modern disinfestation techniques. A sizable millet and sorghum milling facility in Zinder, (SOTRAMIL) was at one time involved in cowpea trade. They reportedly used insect repelling/killing candles in storage bin openings to control infestation, although this may have been before the ready availability of phostoxin and other insecticides. In the U.S., Phostoxin retails for about \$0.10 per tablet and the recommended dosage is 60-180 tablets per 1000 bushels of grain, amounting to a cost of \$0.22-\$0.66/mt. The cost in Niger is probably higher due to the cost of importing and the higher rate of application, but the cost is small compared to the value of the crop.

Research on improved storage is taking several forms in Niger and elsewhere in West Africa. Neem trees were introduced into the region from India many years ago and are used for cowpea storage as previously mentioned. There are also efforts underway to assess the practicality of isolating neem oil from the leaves and even the active principle from the oil. Neem apparently has a low degree of human toxicity, as it is used as a dentifrice. Coating cowpea seed with other oils (e.g., peanut) has been shown to reduce infestation by boring insects and is also being recommended (Pereira, 1983). Research on the use of steel drums or other hermetically sealed containers in Senegal has shown that pests soon die due to lack of oxygen in such circumstances. Of course, care must be taken not to reintroduce insects when the containers are opened. Disinfestation

may also be achieved by heat, with the use of solar collecting devices being especially promising (Nakayama et al., 1983). Application of this technique to cowpeas is being investigated in Cameroon under the CRSP program (Murdock et al., 1988) and in Burkina Faso. Finally, efforts to breed insect resistance into cowpeas is underway at IITA, ICRISAT and associated national programs. The mechanism of this resistance is not known with certainty, although increased trypsin inhibitor or seedcoat tannins seem likely candidates. It is important to note that either of these changes may be accomplished without compromising the nutritional quality of the seed. Seed-coat tannins would not interfere with utilization if the seed coat were removed prior to consumption; however, some reduction would be expected in cooked whole seed. Enzyme inhibitors have a desirable amino acid profile (high in sulfur amino acids) and become digestible with sufficient heat treatment during cooking.

2.6.3 Market Information

The flow of price information is facilitated by the frequent movement of trucks between major trade centers in Niger and Northern Nigeria. In rural areas near Nigeria, information moves with the numerous small traders travelling back and forth over the border. Cowpea prices in Nigeria are announced periodically in Hausa on the Nigeria radio network, providing another, though less significant source of information. In rural areas not contiguous to the border, the lack of information about prices and market conditions remains a major problem.

Traders interviewed were well-informed about prices both within Niger and in Nigeria. For example, daily prices in Kano are known in Maradi, Zinder and other trading centers in Niger with only a two to four-hour time lag, corresponding to the range of typical travel times between the central Niger market towns and Kano. For the smaller traders, information is passed by other traders or transporters travelling back and forth while larger traders receive price information regularly by telephone. Producers are less well-informed about cowpea prices, however. This is particularly true in villages which are located some distance from major towns or highways.

The Government of Niger is presently planning to undertake a system of weekly radio broadcasts of market price information at the arrondissement level in Hausa, Djerma, and Peuhl. The system will be financed under the USAID-funded ASDG. Data collection systems for prices were established for livestock and improved for agriculture under the USAID-funded Integrated Livestock Project (ILP) and ASDG respectively. The availability of cowpea price information will reduce uncertainty for farmers and better enable them to make storage or selling decisions.

2.6.4 Credit

Formal credit institutions in Niger have been undergoing a sharp recession since the early 1980's. The share of credit available to the non-government sector has been falling and a large portion of the bank credit to non-government institutions has been allocated to public or semi-public enterprises as opposed to the private sector. As a consequence, informal credit plays a far more important role than institutional credit in facilitating the exchange process and transfer of commodities as they move from producers to consumers.

Traders play a dominant role in the flow of informal finance in both rural and urban areas. Due to the size of their potential collateral in the form of assets and merchandise stock, larger wholesalers secure most of their credit through banks. These funds are transformed into shorter-term lending throughout the marketing channel. In urban areas, wholesalers consign important stocks of merchandise on credit to smaller-size traders, who in turn are the principal source of credit for urban retailers. The liquidity introduced at the wholesale level flows down to the village setting through rural traders and local assemblers.

Even more important than traders and merchants as a source of loans for farmers are relatives, friends and neighbors. The predominant form of informal borrowing is in food crops; transactions in kind are less costly and allow easy circulation of temporary surplus generated in the rural economy. Cash loans are nonetheless significant and, as the primary cash crop, cowpeas provide the basis for most of these transactions.

2.7 Government Regulation and Support

2.7.1 Role of SONARA

In 1975 the government of Niger legislated a marketing monopoly of the cowpea sector. Responsibility was given to an existing parastatal, SONARA. This monopoly was rescinded in 1984, though SONARA still engages in marketing activities.

SONARA's initial functions after its creation in 1962 concerned the marketing of peanuts. But beginning in the early 70's, peanut production and exports declined sharply and by 1975 cowpeas had become the principal export crop. Although SONARA enjoyed a statutory monopoly on cowpea exporting from 1975 to 1984, its share of exports was small. Most exports were channeled through the informal sector, due to

the low prices offered by SONARA. The prevailing open market price for cowpeas between 1976 and 1983 was nearly double the official price offered by SONARA.¹

SONARA was responsible for "secondary" cowpea marketing, buying from collection agents (organismes stockeurs), and cooperatives who were licensed to collect cowpeas in rural areas. SONARA simply did not have the expertise to collect the crop and therefore relied upon these agents who received a commission for their services.

Unlike other parastatals involved in agriculture, such as the Compagnie française de développement des textiles (CFDT) which was involved in cotton marketing, SONARA does not provide technical advice or seeds and other inputs on credit to producers. It is, therefore not surprising to note that cowpea production has stagnated since the creation of the SONARA monopoly.

In 1984, the SONARA monopoly was rescinded by the Niger government (Statute No. 050 MCT/DCI/MDR) to allow private traders and cooperatives to export cowpeas. This change in policy has been little publicized throughout the country. Many farmers and traders have only recently become aware that they can apply for an export license. Official cowpea exporting is still dominated by large, politically influential traders who were able to obtain authorization from the prefet (governor) to export cowpeas to Nigeria during the years of the SONARA monopoly. These export permits were extremely difficult to obtain and were made available only to a few politically influential large-scale traders, located mostly in the Zinder and Maradi Departments. Many medium-sized traders, once active in the cowpea export market, ceased any exporting due to the SONARA monopoly, the export tax, and the high cost of fulfilling the requirements to obtain export licenses (see section 2.7.3).

2.7.2 The Export Tax

The export tax on cowpeas, which formerly acted as a disincentive to export through the formal sector, was abolished in October 1988 -- in part as a result of findings in the first phase of the present study. Prior to its removal, the export tax of 20 cfa/kg. or 2,000 cfa per 100 kg. sack acted as a barrier to entering or re-entering the cowpea export trade as medium-sized and smaller traders did not possess the necessary financial resources. Most of the politically influential large-scale traders who received a special authorization from the prefet to export during the SONARA monopoly years did not pay the full tax. Rather they "arranged" to pay a lower tax, such as 5 cfa/kg. or none at all.

1. Regis Mitjavile, Diagnostic de la SONARA, Etude IDA/OSEM, December 1983.

The maintenance of the export tax therefore suited the larger traders as it restricted the entry of other traders who would increase competition and reduce their profit margins (oligopolistic profits). An analysis of the effect of the export tax on cowpea market appears in Appendix G.

2.7.3 Fiscal and Administrative Procedures

The fiscal and administrative procedures to be completed before obtaining an export license are numerous, time-consuming, and very costly.

Recent reports by David Wilcock (July 1987), Andy Cook (1988), William Grant et al. (January 1988), and Roger Poulin et al. (Feb. 1988), describe in detail the official procedures to be undertaken in order to obtain an export permit. Figure 5 presents the steps and procedures necessary for traders to legally export cowpeas from Niger. It is an adaptation of the tables presented in the Wilcock and Cook reports, incorporating data collected in the first and second phase of the cowpea study.

The total cost for the trader to enter the formal cowpea report market is prohibitively high, reaching 483,000 CFA in preliminary costs before payment of 7,500 CFA for a one-month export license or 3,000 CFA for a special one-time export permit from the prefet. Few traders dispose of these sums. Although simplified in recent years,¹ the process is still quite time-consuming. Nor is it clear from the traders' point of view that there are any incentives to entering the formal sector as so many controls are applied.

In contrast to the formal sector, there are few costs or disincentives associated with exporting through the informal sector. While there is always the possibility of product confiscation by customs agents, the risk is minimal. Given the budgetary and physical limits placed on the customs service, it is impossible to maintain tight controls. It has also been noted (Grant et al., Jan. 1988) that the customs agents themselves do not have a clear understanding of the difference between the formal and informal sectors. There is also a distinction made between the customs offices located in large towns and those located at the border. The formal sector exports through the regional or sub-regional offices located in large towns, as it is necessary to present export permits and other documentation. The informal sector exports via the small border posts where procedures are not strict. According to regulations, these border posts are only allowed to let pass without an export license merchandise of a value less

1. In previous years all elements had to be obtained from Niamey rather than the regional authorities (prefectures).

than 500,000 CFA, although in practice 30 ton truckloads of cowpeas (valued at up to 5 million CFA) usually have no problems in passing. Traders state that the amount of informal payments (cadeaux, or bribes) is the same whether one is following informal or formal channels. Hence, it would appear that traders have little incentive to export via formal channels.

Figure 5

Administrative Steps to Legally Export Cowpeas

<u>Procedural Step</u>	<u>Location</u>	<u>Description of Requirements</u>	<u>Cost (cfa)</u>	<u>Time Needed</u>	<u>Renewal Frequency</u>
1. Preliminary documents	Prefecture (conseil regional de Development) or Ministry of Commerce -- for Non-Nigeriens	Present a file containing: - proof of Nationality (Nigerien) - permission of Prefet/Commerce (non-Nigerien) - proof of solvency from a bank - certificate of non-criminality	--	up to 6 mos.	
2. Registre Commercial	Min. of Justice	possession of preliminary documents	2,500	same day	doesn't need to be renewed
3. Patente Forfetaire*	Contributions Diverses	registration on the Registre Commercial	435,000	same day (minimum)	annually
4. Subscription to the Chamber of Commerce	Chamber of Commerce	payment of the patente	50,000	same day	annually
5. Subscription to CNUT	Conseil National des Utilisateurs des Transport à Niamey	payment of the patente	35,000	3 weeks (done in Niamey)	annually
6. Request for: a. Export licence <u>or</u> b. autorisation speciale	Prefecture/Commerce Prefecture	all previous steps all previous steps (except in exceptional cases**)	7,500 3,000	2-7 days 2-7 days	3 months 2 months

* The patente forfaitaire is 435,000 FCFA in the case of most traders. It consists of a 240,000 FCFA fixed tax and a 195,000 FCFA export patente. The fixed tax is only levied on those traders who have no records of having paid any annual tax or no established book-keeping system. Other traders pay only the 195,000 FCFA export patente.

** Some prefets give "special authorizations" to some powerful or well-placed traders who have not fulfilled all the requirements 1 through 5.

3. THE NIGERIA MARKET FOR NIGER COWPEAS

3.1 Introduction

Nigeria, with a population estimated at approximately 100 million (1985), is the major outlet for cowpea exports from Niger. Although Nigeria produced an average of 660,000 tons of cowpeas per year from 1982 to 1987, the large market demand in southern Nigeria easily absorbs all the cowpea exports from Niger. While Nigeria is a surplus producer of many agricultural crops such as maize, millet, and sorghum, Niger has an advantage in producing cowpeas due to its drier climate and sandier soils.

In recent years Nigeria has increased investment in agriculture. The fall in foreign exchange earnings due to the fall in the world price of oil has revived interest in agriculture in order to increase the degree of food self-sufficiency and decrease the need for costly imports. For this reason, the government has banned the importation of some agricultural goods, including cowpeas, to stimulate domestic production. However, special cowpea import licenses have been granted to two firms, NAMCO and OSCUDA.

The devaluation of the Naira in 1986 and subsequent devaluations have increased the cost of imported goods in local currency terms. Due to the shortages of foreign exchange available to Nigerian businessmen, a system of barter has developed in the cowpea trade. Nigerian traders ship cereals and manufactured goods available in Nigeria to Niger as payment for Niger cowpeas. Niger exporters also exchange cowpeas for cereals and manufactured goods, which they import into Niger and sell for CFA. In this way they avoid the problem of having to liquidate large Naira sums. In cases of barter, cereal/cowpea or manufactured goods/cowpea terms of trade become a more important determinant of incentives to trade than the exchange rate.

Larger formal traders or firms such as SONARA, who export and are paid in hard currency at the official exchange rate through international letters of credit, are penalized in using the official market channel, where transactions take place at overvalued official exchange rates. In the informal market goods are bought and sold at the unofficial or parallel market exchange rate, which is more advantageous to the Niger buyer of Nigerian goods.¹ In contrast, NAMCO and OSCUDA benefit by using the formal channel, bank letters of credit and the official exchange rate which gives them more CFA for their Naira than the parallel market.

1. For example in December 1988, at the parallel exchange rate, 40 CFA = 1 Naira; at the official market rate 55 CFA = 1 Naira.

The vast majority of cowpea imports to Nigeria come from Niger although no statistics are available. While small amounts of cowpeas are said to come from Cameroon and Chad, no evidence of this was found in the markets in Kano or Lagos. Traders interviewed dealt only in cowpeas from Niger. Imports from Cameroon and Chad are likely to be shipped to northeastern Nigerian cities such as Maiduguri and Mubi.

3.2 Cowpea Production in Nigeria

Although cowpeas are produced in nearly every state of Nigeria, the principal producing zones are in the north, especially in Kano, Sokoto, Kaduna, and Bauchi States, where the drier climate is most favorable to production. (See Figure 6 for a map of major producing areas.) As in Niger, cowpeas are intercropped with cereals. In Northern Nigeria cowpeas are the third most important crop in terms of total production after millet and sorghum. Yields are low, averaging less than 200 kgs per hectare. Nigerian cowpea production averages approximately 650,000 tons annually, as shown in Table 14 for the years 1982-1987.

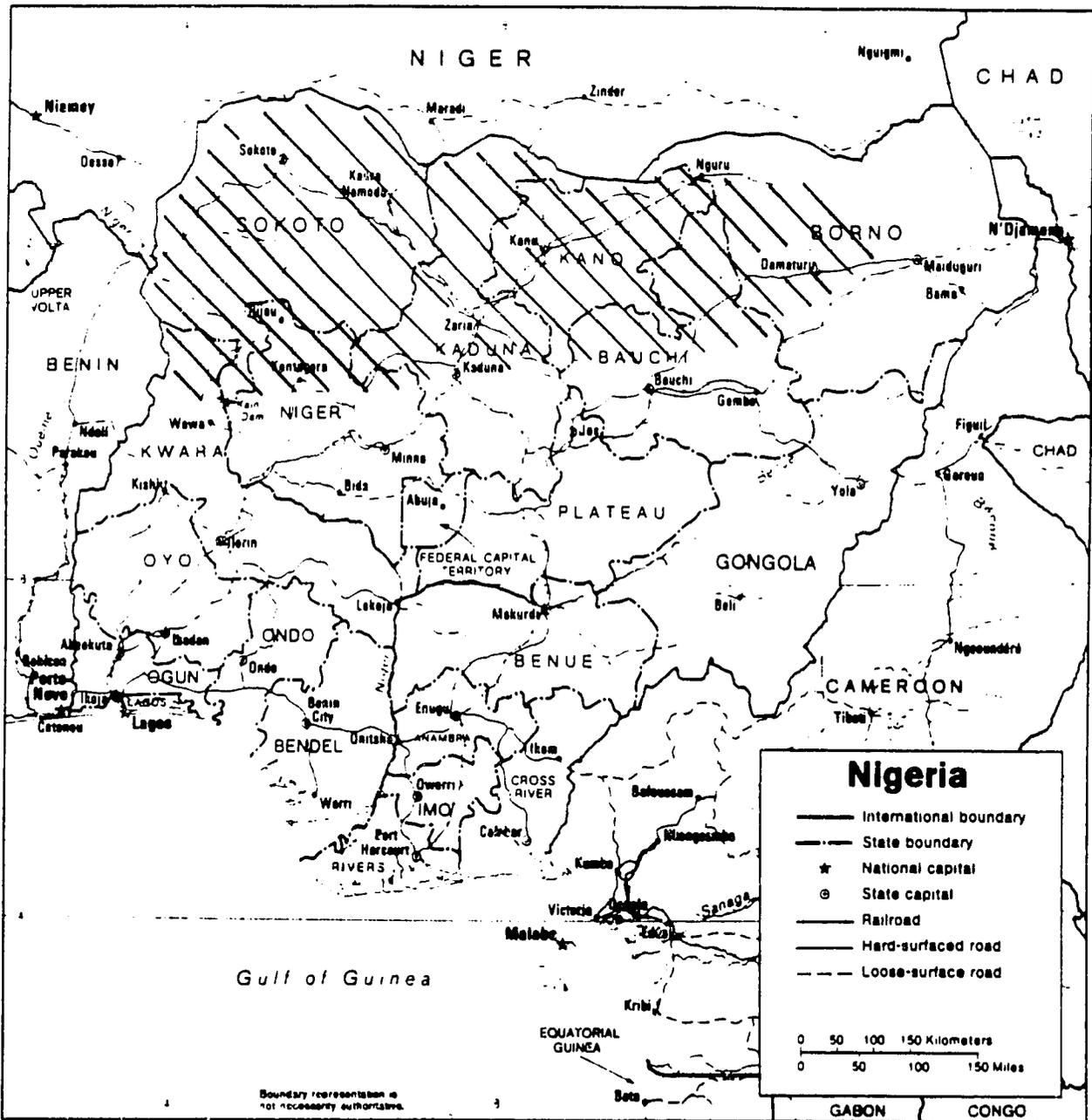
The production season for cowpeas in Northern Nigeria is the same as in Niger. Cowpeas are also produced during the dry season on perimeters irrigated by the Sokoto-Rima River Basin and Rural Authority, and in Kano State, but this comprises only a small part of total cowpea production.

There is regional specialization in cowpea varieties within Nigeria. The larger red bean variety comes from Maiduguri and the white varieties from Kano.

The monthly retail price data for Kano shown in Table 15 demonstrate the typically low prices which prevailed in the post-harvest period of January to March 1987. The substantially higher prices recorded in 1988 are probably due to the relative scarcity of cowpeas due to a drop in production in Niger of over 80,000 metric tons in 1987 relative to 1986 and ensuing low levels of exports to Nigeria.

Figure 6

Map Showing Cowpea Production Zones in Nigeria



Base 504599 8-80 (545622)

Table 14
Total Cowpea Production in Nigeria
1982-1987
(metric tons)

1982	616,000
1983	664,000
1984	447,000
1985	611,000
1986	732,000
1987	887,000
Six-year mean	659,500

Source: Central Bank of Nigeria. Annual Report and Statement of Account, 1984 and 1987.

3.3 Cowpea Prices

Incomplete monthly retail price data are shown in Tables 15 and 16 for 1987-88. The reported prices are an unweighted average of red and white cowpea prices. Consumer tastes vary from city to city in the south. Lagos consumers prefer the larger red cowpea bean variety which comes from Maiduguri in Northern Nigeria. The white beans are preferred in the Eastern States, where consumption of cowpeas is greatest.

Comparative cowpea prices for the farm level in Niger and for the urban markets of Zinder, Kano, and Lagos are presented in Table 17. The RA team was unable to obtain monthly time-series data over a multiple-year period for Kano and other centers in Nigeria, so any conclusions about seasonal trends are necessarily preliminary. According to Kano cowpea wholesalers and as suggested by the 1988 price data, it appears as if Niger cowpeas are not competitive in the Kano (Nigeria) market until February or March. In December 1988 the price differential between Zinder (90 CFA/kg) and Kano (120 CFA/kg) was too small for traders to break even, much less make a profit in exporting cowpeas from Niger to Nigeria. As a result, traders buy and store cowpeas (in both Niger and Kano) until prices rise seasonally later in the year.

Table 15

Cowpea Monthly Retail Prices in Kano, 1987-88
(in CFA/kg.)

	<u>1987</u>	<u>1988</u>
January	82	136
February	84	157*
March	90	179*
April	100	175*
May	102	180*
June	107	
July	120	226
August	132	
September	112	
October	109	
November	109	213
December	111	120

* Figures based on incomplete survey data.

Source: Kano State Agricultural and Rural Development Authority, Planning and Community Development Department, 1987-1988, and survey data May, December, 1988.

Note: Kano retail prices were paid in Naira. The Naira prices were converted to CFA at the parallel exchange rates prevailing during each month.

Table 16

Average Monthly Retail Prices for Cowpeas
in Lagos in 1987 and 1988
(in CFA/kg.)

	<u>1987</u>	<u>1988</u>
January	160	192
May	--	198 (white) 228 (red)
July	160	
October	161	
December	225	

Note: Prices are an average of all bean varieties, including red and white, except for May 1988. Kano retail prices were paid in Naira. The Naira prices were converted to CFA at the parallel exchange rates prevailing during each month.

Source: USAID Mission/Lagos, Nigeria, and the Concord newspaper, Lagos, May 13, 1988.

Table 17

Cowpea Prices at the Farm Level, and
in Niger, Zinder, Kano and Lagos
(in CFA/kg.)

	<u>Dec '87</u>	<u>Jan '88</u>	<u>May '88</u>	<u>Dec '88</u>
Farm Level	60	--	--	90
Zinder ^a	--	180	150	90
Kano ^b	111	136 ^c	180	120
Lagos ^b	278	238	255 (white) (red)	164

a Prices cited are wholesale prices

b Prices cited are retail prices

c Based on partial survey data.

Note: Prices are an average for all varieties except in Lagos in May 1988. Kano retail prices were paid in Naira. The Naira prices were converted to CFA at the parallel exchange rates prevailing during each month.

Sources: Kano State Agricultural and Rural Development Authority, Kano State, Nigeria; USAID Mission, Lagos, Nigeria; Central Bank of Nigeria Annual Report, 1987 and survey data May, December 1988.

3.4 The Marketing System

Cowpeas in Nigeria flow from north to south. Kano is the trading capital, serving as a collection point for cowpeas from Niger and parts of Northern Nigeria. Figure 7 presents the dominant market channel for Niger cowpea exports. Cowpeas are imported from Niger by importers or importer/wholesalers in Kano and Kaduna, who then sell them to wholesalers in the North (mostly in Kano and Sokoto), where commission agents of the large southern wholesalers reside. The commission agents negotiate purchase of cowpeas for their patrons in the South. Cowpeas are then transported to such southern cities as Lagos, Onitsha, Ibadan, and Osogbo, where they are sold first to retailers and then to consumers.

3.4.1 Importers/Wholesalers

Only two major firms have authority to import cowpeas from Niger: NAMCO and OSCUDA, both based in Kaduna (although NAMCO has offices in Kano).¹ The importer/wholesaler imports cowpeas from Niger and then sells them to other wholesalers in Kano, the major assembly point, where the great majority of Niger cowpeas pass on their way south.

Transport is either arranged by the exporter in Niger or by wholesalers from Kano who have pre-arranged to buy the cowpeas through NAMCO or OSCUDA. In the latter case the cowpea imports never physically pass through the hands of the major importers, although all import forms and authorizations are in their name.

NAMCO also buys cowpeas from SONARA and sells regularly to ten wholesalers located in Kano. Both NAMCO and SONARA were unwilling to provide the RA team with any data.

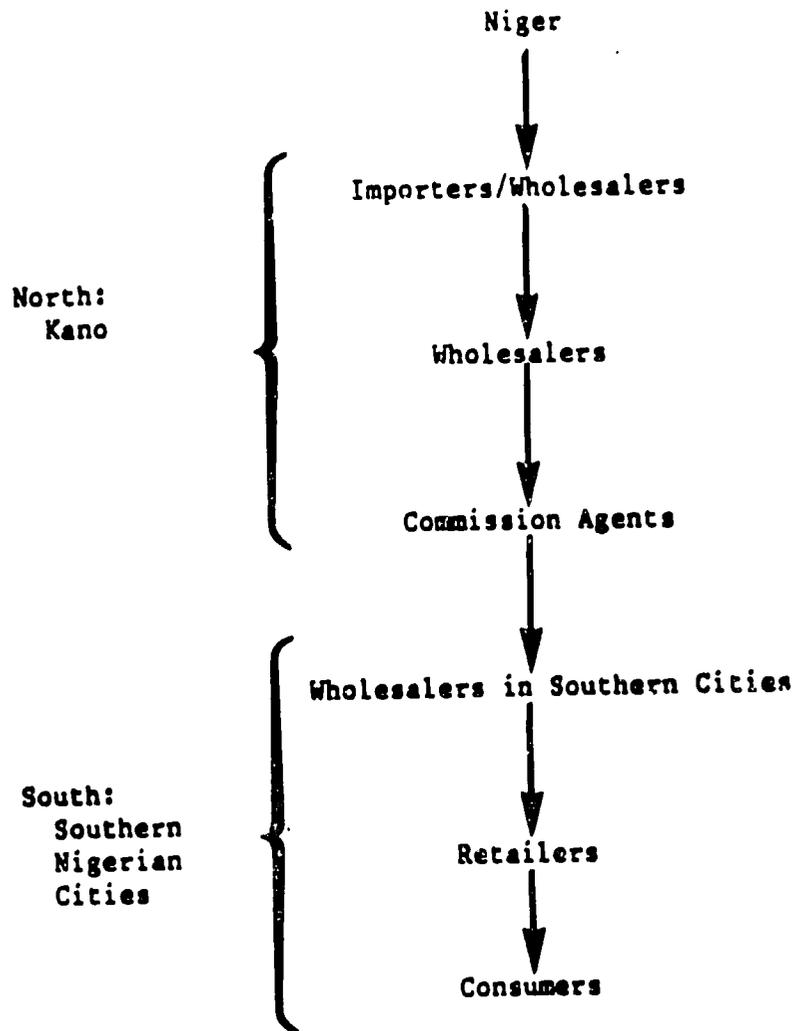
3.4.2 Wholesalers (Northern Nigeria)

Wholesalers in Kano and Sokoto purchase cowpeas from the major importing houses who have warehouses in Kano, or they travel to Niger and organize the transport themselves. Many wholesalers buy more than 2,000 tons of Niger cowpeas per year. There is considerable competition among the numerous wholesalers. Before the imposition of import restrictions, many wholesalers travelled to Niger to purchase cowpeas and import them to Nigeria.

1. We were informed that a third import authorization had been awarded for cowpeas but were unable to obtain specific information.

Figure 7

Market Distribution Channel for
Niger Cowpeas in Nigeria



In Kano the major traders are located in the wholesale market, Dawano, which is located nine kilometers from the center of the town. The traders meet with commission agents in storerooms built of mudbrick walls and corrugated iron roofs to negotiate sales of cowpeas to southern wholesalers. Cowpeas are not generally stored in Kano for longer than three to four months as the government authorities are very strict about any hoarding of foodstuffs. A local government tax of 1 Naira (50 CFA) for every sack sold is paid by the wholesaler and collected by local government agents who are stationed in the market.

3.4.3 Commission Agents

Commission agents living in Kano negotiate sales between wholesalers in the North and South. Each commission agent represents several wholesalers from Southern Nigeria. Trading is usually along ethnic lines as Ibo agents represent Ibo traders and Yoruba agents represent Yoruba traders. Traders from the South feel more comfortable dealing with a commission agent who speaks his own language. Common ethnicity also increases trust and reduces risk of default, thus lowering transaction costs. The relationship between commission agent and the southern trader is a close one; indeed it is often referred to as a patron-client relationship (maigida). The agent receives 2-4 Naira per sack for his services of price negotiation and facilitation.

3.4.4 Wholesalers (Southern Nigeria)

Many wholesalers from Southern Nigeria travel to the North to Kano, Maiduguri and Gadem to purchase cowpeas. All price negotiation is done through representatives in the North who act as commission agents. All transport and related costs (see Appendix H) are paid by the wholesaler. Wholesalers sell the cowpeas to retailers or other wholesalers in the South.

3.4.5 Retailers

Retailers in the South sell cowpeas in tija (2.5 kilogram containers) or small 16 kg. sacks in open air markets or in boutiques which sell a mixture of food and non-food products.

3.5 Cowpea Utilization

The long tradition of cowpea use in Nigeria is well documented. One of the earliest accounts of local cowpea cookery in West Africa in general and Nigeria in par-

ticular dates as far back as 1937.¹ Iso ozube or "Hunters' Food" is a cowpea-maize dish preserved with oil and pepper and stored in gourds. This filling meal used to feed hunters and soldiers for a period as long as one year without spoiling. In the Borgou tribe, one farmers' dish is kauwa, a heavy cowpea paste reputed to fill the stomach from dawn to dusk.

Cowpeas are used in many states in ceremonies. Cowpea dishes are served in ceremonies including Christian observances, marriages, deaths, birthday parties and local religious worship. Among the Hausa tribe, wasa-wasa or anberuwa, a cowpea steamed dough, is a special dish without which marriages are sometimes considered incomplete. Among the Yoruba tribe, akara, a cowpea paste, is fried for three consecutive days starting from the evening of a death. On the second day, drumming accompanies the distribution of akara among mourners. Drumming and eating stop on the third day to announce that the deceased has been buried. Twenty-one days after the burial, akara balls are distributed to call the elders and share the property of the deceased. After forty days of mourning, akara and many other dishes are prepared and shared among the members of the family during a feast performed to free the wives of the deceased who would otherwise be regarded as unclean.^{2,3}

Roman catholics abstain from eating meat on Good Friday and make a cowpea dish called frejon. Hindus and Seventh Day Adventists who refrain from food with blood eat cowpeas to supplement the protein content of their meals. It is also common for Muslims in Nigeria to distribute akara to the poor on Fridays. Finally, cowpeas are regarded as sacred among both the Yoruba and Hausa tribes and are consequently prescribed for sacrifices to appease deities and abate evils.

Medical use of cowpeas is common among the Ibos and some Hausas. Ground cowpeas, for instance, are often mixed with oil to treat skin infections. Similarly, in rural areas, medical doctors sometimes prescribe cowpeas as remedial foods for children who suffer from kwashiorkor or marasmus.

1. J.M. Dalziel, The Useful Plants of West Tropical Africa. Crown Agents for Overseas Governments and Administratives, London, England, 1937.
2. Carol E. Williams, "Cowpea Processing and Utilization." Food Crops Utilization and Nutrition Course, IITA, 17th-20th June 1988, pp. 11-12.
3. Ibid., p. 13 and Carol E. Williams, "A Preliminary Study of Consumer Preferences in the Choice of Cowpeas - Western and Kwara States Headquarters and Areas of Nigeria". Department of Agricultural Economics and Extension, University of Ibadan, Ibadan, Nigeria, June 1974, p/o.

Cowpeas are also consumed in a variety of ways and in abundance throughout the year. Even though they were commonly used as a filler, they are becoming an important complement to starchy foods to the point where they are now being called "poor man's meat" on account of their high protein content. In a survey conducted in Kwara and Western States of Nigeria, every family ate cowpea dishes at least once a week. Almost one-third of the respondents reported eating cowpeas many times a week and one-fourth ate cowpea dishes at least once daily. Asked at what meal of the day they liked to eat cowpeas, many respondents reported two meals. More than 40 percent preferred cowpeas as lunch dishes, approximately one-third liked them for breakfast, and 18 percent preferred them for dinner.¹ In the Nsukka area of Eastern Nigeria, cowpea purchases varied from 170 to 775 grams per week and consumption from once per week (12 percent of households) to 3 times per week (35 percent) or more (23 percent).²

In addition to traditional cowpea-based foods for adults, there has been an increased emphasis on weaning foods derived from blends of cowpea, cereals and other indigenous staples. In the Nsukka area, a recent survey³ has shown that 64 percent of mothers introduce cowpeas into the diets of their children between 7 and 12 months and 33 percent between 0 and 7 months. In Onitsha, 67 percent used cowpeas for weaning.⁴ Another study⁵ found that cowpeas provided 30-36 percent of dietary protein for 30-month to 3-year-old children in the Osegera region. For these reasons, research efforts on using cowpeas in weaning foods are underway in the major universities of Nigeria.⁶ This research generally features designing mixtures based on known compositions of ingredients, investigating partial or complete precooking, and assessing the effects of composition and processing on actual nutritional quality by chemical, animal or human trials.

1. Ibid., p. 76.

2. J. King, D.O. Nnanyelugo, H. Ene Oborg and P. Ngoddy, "Household Consumption Profile of Cowpea (*Vigna Unguiculata*) among Low-Income Families in Nigeria." Ecol. Food Nutr., 1988, 17: 271-287.

3. A.C. Uwaegbute and D.O. Nnanyelugo, "Nutritive Value and Biological Evaluation of Processed Cowpea Diets Compared with Local Weaning Foods in Nigeria." Nutr. Rep. Int., 1987, 36:119-129

4. H.N. Ene-Obong. "Maker Index, Consumption Pattern and Contribution of Cowpea/Legumes to the Nutrient Intakes of Selected Communities in Nsukka." M.Sc. Thesis, University of Nigeria, Nsukka, 1984.

5. I.D. Akinyela and A. Adesina. "Infant Food Preparations from Cowpea, Coconut and Soybean." J. Food Technol., 1986, 21:711-715.

6. For instance, A.C. Uwaegbute and D.O. Nnanyelugo, Op.cit., I.O. Akinyele and A. Adesina, op.cit., and N.R. Nzomiww and I.C. Obizoba, "Nutritional Responses of Rats Fed Mixtures of Plant and Animal Protein," Trop. Sci., 1986, 26:101-119.

Cowpeas are generally dehulled before preparation.¹ Dehulling is based on one of three methods which involve:

- (1) Cleaning, soaking and peeling: a deep rounded-out calabash is often used to wash the cowpeas. With abundant water, stray stones are picked out by hand. If thoroughly soaked, the seed coats can be removed by hand. In other instances, bruising the skin with a grinding stone or a mortar is needed before washing in plenty of water to float off the seed coats;
- (2) Crushing the cowpeas to loosen the seed coats and blowing the seed coats off a metal or rush tray; and
- (3) A combination of the two methods which involves soaking the broken seeds and floating off the remaining seed coats. With some cowpea varieties, it is necessary² to soak the cowpeas after the blowing before all the seed coats are removed.²

Cowpeas are consumed in a variety of ways in Nigeria. They are, however, rarely consumed alone. Cowpeas are often consumed with rice or other cereals,³ in soups and stews, and as the very popular breakfast snack and party foods, akara and moin-moin (see Appendix D-6 for a list of some of these foods and their major ingredients). Many traditional dishes require the decortication of cowpeas. As described above, this process is slow and labor-intensive. It is considered a major constraint to increased consumption of cowpeas in a society where women are overburdened with traditional and newly-added responsibilities. The need to investigate this constraint formed the rationale for a USAID Bean and Cowpea CRSP supported project at the University of Georgia and the University of Nigeria, Nsukka, which has developed and implemented a village-level technology for producing a ready-to-use flour (meal) from cowpeas. The ultimate goal of this and other research in Nigeria is to increase the consumption of cowpeas in marginally nourished populations by decreasing the time and labor necessary to prepare cowpea-based foods.

1. Some laboratory studies have shown that removal of the seed coat improves the protein quality of both the cooked cotyledons and the cooking broth (Ricardo Bressani, "Nutritive Value of Cowpea," in Cowpea Research, Production and Utilization, edited by S.R. Singh and K.O. Rachie, John Wiley and Sons Ltd., 1985, p. 356).

2. Carol E. Williams, "A Preliminary Study...", Op.cit., p. 39 and F.E. Dorlo, C.E. Williams and L. Zooka. Cowpeas: Home Preparation and Use in West Africa, International Development Research Center, Ottawa, Canada, 1976, pp. 20-24.

3. Nutritional studies have demonstrated that cowpeas' amino acid profile is complementary to that of cereal grains. Laboratory work has also shown that protein quality is synergetically improved in cowpea-cereal mixes because of the lysine contributed by the cowpea and the methionine contributed by the cereal (Ricardo Bressani, op. cit., p. 354.)

The varieties used depend on the geographic region and the ethnic group. For instance, while only three main varieties are commonly consumed in Maiduguri in the North-East, more than 15 varieties can be found in Ibadan in the South-West.¹ Reasons influencing choice of variety for plain cooking include short-soaking time, peeling ability, quick-cooking quality, increase in volume after cooking, flavor, texture and color. Criteria for choice of cowpeas in processed dishes are lipid binding quality, water absorption, fast-grinding ability, gelatinization and pasting or texture, finished appearance and flavor.

While a number of dishes are made from freshly-prepared cowpea flour, especially for ceremonies, most households do not process flour. Surveys indicate that cowpea flour is difficult to make, that the products made from flour taste differently from those made from fresh paste, and that some of the glutinous effect of the paste is lost when cowpeas are powderized.² Recently, the Bean/Cowpea CRSP project conducted at the University of Georgia and the University of Nigeria, Nsukka have overcome a number of these problems. A technology for producing an acceptable cowpea meal at high yield has been developed, evaluated and implemented both at the village level (near Nsukka in Anambra State and near Owerri in Imo State) and at the industrial level (Lasabi Mills, Lagos). This process involves briefly wetting cowpeas to achieve a moisture content of about 25 percent and then immediately drying to release the seed coats. Seed coats are removed by either abrasive or non-breaking impact milling (e.g., as in the second stage of an Engleberg rice mill which features leather flails mounted on a wooden shaft). Seed coats are removed by aspiration during or subsequent to this step. A hammer mill is used for final grinding to a coarse meal. The major constraint on this process as recently as late summer of 1988 was the high price of cowpeas (5000-6000 naira/mt) in southern Nigeria.

3.6 Cowpea Demand

The following tables present estimates of income elasticities of selected food items (Table 18) and expenditures on these items as percentages of total expenditure and as percentages of expenditure on food in selected areas of Nigeria (Table 19). Consumers' expenditure on cowpeas represents a small fraction of total expenditure as well as of expenditure on food (0.6-1.2 percent and 1.1-2.8 percent, respectively). Estimates of income elasticities indicate that demand for food is relatively inelastic and that demand

1. F. E. Doulo, *et al.*, *op. cit.*, pp. 17-18.

2. C. E. Williams, "A Preliminary Study...", *op. cit.*, pp. 30-38.

for cowpeas is the least elastic among major food items. The negative income coefficient for Sokoto shows that cowpeas may be an inferior food item there. However, the coefficient is not statistically different from zero, so this finding is inconclusive.

Table 18

Estimates of Income Elasticities
of Selected Food Items in Nigeria

<u>Item/Location</u>	<u>Sokoto</u>	<u>Jos</u>	<u>Rural Zaria</u>	<u>Ibadan</u>	<u>Enugu</u>	<u>Average¹</u>
Cowpeas	-0.30	0.21	0.33	0.15	-	0.23
Rice ²	0.15	0.14	0.85	0.47	0.42	0.41
Meat ³	0.27	0.29	0.93	0.53	0.70	0.54
All Food	0.26	0.34	0.39	0.71	0.60	0.46

1. Due to the statistical insignificance of the coefficient, Sokoto is excluded from the cowpea average.
2. All cereals for Ibadan and Enugu.
3. Animal protein for Ibadan and Enugu.

Source: N.O.O. Ejiga, "Economic Analysis of Storage, Distribution and Consumption of Cowpeas in Northern Nigeria." Unpublished Ph.D. thesis, Cornell University, August 1976, Table 14.11, p. 352.

Table 19

Estimated Expenditures on Selected Food
Items as Percentages of Total Expenditures and Total Food
Expenditures in Nigeria

<u>Item/Location</u>	<u>Sokoto</u>	<u>Jos</u>	<u>Kaduna and Zaria</u>	<u>Zaria Province</u>
	<u>Percent of Total Expenditure</u>			
Cowpeas	1.0	1.2	0.6	1.2
Rice	15.1	3.7	4.2	2.4
Meat and Fish	8.1	11.9	10.9	6.0
All Food	26.3	52.6	52.4	45.4
	<u>Percent of Expenditure on Food</u>			
Cowpeas	2.8	2.3	1.1	2.6
Rice	57.4	7.0	8.0	5.3
Meat and Fish	30.8	22.6	20.8	13.2

Source: N.O.O. Ejiga, "Economic Analysis of Storage, Distribution and Consumption of Cowpeas in Northern Nigeria." Unpublished Ph.D. thesis, Cornell University, August, 1977, Table 14.10, p. 351.

3.7 Projected Cowpea Consumption in Nigeria

Nigeria, with a population over fifteen times that of Niger and more highly urbanized, is the key market for Niger cowpeas and will remain so for years to come. Projecting growth in Nigeria's cowpea consumption is a risky undertaking, particularly with the limited data available. Growth rates will depend upon several important variables: population growth rates in rural and urban areas and overall, the growth rate of per capita real incomes, the composition and distribution of income gains by socioeconomic and income group, relative price relationships among key staples (cowpeas, grains, tubers and perhaps red meat), changes in consumer tastes and preferences, the success of promotional and nutrition campaigns, the availability of lower-cost (and high-quality) mechanized processing, changes in oil prices and transport costs, increasing urbanization and the economic necessity and convenience of buying and consuming "street food" for morning and midday meals, and other possible factors.

At the risk of missing the mark, we forecast growth rates of cowpea, rice and meat consumption using the World Bank's projected population growth rate, three different income growth rates, and Ejiga's estimates of expenditure elasticities of demand for staple foods (see Table 20). The following simple formulation is used in the calculations: rate of consumption growth for commodity i = rate of population growth + (income elasticity of demand for commodity i * rate of per capita income growth). The population growth rate of 3.4% is a World Bank projection for the 1985-2000 period. Three rates of average annual growth of per capita income are used: 2.2% corresponding to the rate that prevailed over the 1965-1985 period, 1.0% and - 1.0%. Ejiga's expenditure elasticities, calculated in 1977 using data from a mid-1970's household survey and earlier farm market studies, are used as a substitute for income elasticities. It is important to note that Ejiga's estimates are obtained from data representing a period of rising prosperity in the Nigerian economy. Expenditure elasticities calculated from cross-sectional data collected during the mid- to late 1980's or from time-series data including observations during the 1980's might yield quite different estimates.

Table 20

**Projected Rate of Growth in Consumption
of Selected Food Items in Nigeria**

<u>Item</u>	<u>Annual Growth Rate Assuming^a Per Capita Income Growth of</u>		
	<u>2.2%</u>	<u>1.0%</u>	<u>-1.0%</u>
Cowpeas	3.9	3.6	3.2
Rice	4.3	3.8	3.0
Meat	4.6	3.9	2.9

a. Calculated as: population growth + income elasticity * per capita real income growth.

Source: World Bank, World Development Report, 1987. Income elasticity figures are from Table 17 (Ejiga, 1977).

As shown in Table 20, projected growth rates of consumption for cowpeas, rice and meat in Nigeria vary as a function of growth in per capita income. Assuming positive income growth rates leads to higher growth rates for the more income elastic commodities, rice and meat. A negative per capita income growth rate would result in a higher growth rate for cowpeas, the commodity for which demand is least elastic.

Despite the importance of per capita income growth rates on commodity consumption growth rates, the principal determinant of consumption growth is the population growth rate. The only cases in which this would not hold would be for those commodities for which demand is very highly income elastic or inelastic.

Anecdotal RA findings suggest that many consumers, likely low-income households, are substituting cowpeas for meat as a source of protein in Nigeria. To the extent that this is true, it is probably driven in part by stagnant or declining real per capita incomes for a broad range of low-income consumers. Another key determinant might be shifting relative prices in favor of cowpeas. Red meat has proved historically to be an excellent inflation hedge in West and Central Africa, often appreciating in real terms over time. In contrast, cowpea production has expanded in Nigeria and Niger since the early 1970's, which would tend to dampen rises in real cowpea prices. Furthermore, cowpea production does well during dry years when livestock herds are cut back by forced sales or mortality. While the initial effect of herd liquidation is to force down red meat prices, this is a short-lived phenomenon. Red meat prices rise to their cyclically highest levels after prices bottom out, as herders and farmers seek to reconstitute their diminished livestock holdings over several years.

Whether or not cowpeas and meat are substitutes in consumption in Nigeria or in Niger cannot be answered in this paper. It could be established empirically through collection of detailed cross-sectional data (on income, expenditures for different types of food, and food consumption) in rural and urban areas over two or more years. To the best of AMIS's knowledge, such data collection efforts are not currently underway in Nigeria. IFPRI is currently conducting detailed farm level surveys in Niger, however, which could generate empirical estimates of price and income elasticities of demand.

As a final observation, we note that the poorest urban and rural consumers in West African countries will typically attempt to satisfy minimal nutrition requirements through producing or purchasing the least costly source of calories. To the extent that consumers attempt to satisfy a protein constraint in food consumption, they may be inclined to purchase cowpeas and other vegetable proteins in place of meat (red meat, fish, poultry) if (1) the protein constraint is not satisfied by cereals and (2) vegetable protein is less costly than animal protein. Issues of amino acid profiles and complementarity may also come into play (from consumers' personal experience rather than based on scientific knowledge of these issues).

3.8 Forecasting Nigerian Cowpea Consumption Gaps and Export Opportunities for Niger Cowpeas

Opportunities for Niger exporters of cowpeas will be affected by the projected growth of cowpea demand in Nigeria. Other important factors affecting Niger's export potential are cowpea production potential in Niger and marketed surplus for export to Nigeria, cowpea consumption levels in Niger, cowpea exports from competing West African suppliers to Nigeria, and cowpea production in Nigeria. Due to data limitations, we will only attempt to estimate in a crude way export potential for Niger.

The assumptions underlying the projection of Nigeria's cowpea import gap in 1992 and 1997, shown in Table 21, are as follows :

1. Niger's cowpea production (1) in 1992 and 1997 is estimated as a linear extrapolation from 1987, using the five-year average for 1983-87 as a base, and extrapolating from 1987. A compound growth rate of 1.0% is assumed, corresponding to the rate of growth in cowpea production over the 1975-1988 period in Niger.
2. As in Table 7, we assume that cowpea exports from Niger (2) comprise 68.8% of cowpea production (100.0% less 15% for seed and 16.2% for domestic consumption) in the base year. For 1992 and 1997, cowpea exports are calculated as production less 15% for seed and forecast consumption. Consumption is forecast assuming a 3.0% population growth rate, a 1.0% per capita income growth rate, an income elasticity of demand of 0.23 (the same as estimated for Nigeria), and no change in the relative prices of staples.
3. Cowpea production in Nigeria (3) is assumed to remain constant over the ten-year period; historical growth rates were negative over the 1975-87 and 1980-87 periods. Growth in production could be positive, of course, with improvements in technology, changes in cowpea prices relative to other staples, and continued depreciation of the naira vis-a-vis the CFA, which would put upward pressure on the price of imported cowpeas and stimulate domestic production.
4. Own cowpea supply in Nigeria (4) is estimated as 85% of domestic production (netting out 15% for seed).
5. Nigeria imports (5) are the sum of estimated imports from Niger, Benin and Cameroon. Niger exports are calculated as total production less 15% for seed and estimated consumption. Benin exports are calculated as 10% of forecast

production (which expands at 3.4% per year, the growth rate in production that prevailed over the 1976-87 period). Cameroon exports are calculated as 20% of forecast production (which expands at 5.0% per year, a slightly lower growth rate in production than the 6.4% rate that prevailed over the 1972-81 period).

6. Nigeria total supply (6) is the sum of Nigeria own supply and imports.
7. We arrive at an estimate of supplies available for consumption in Nigeria (7) by assuming 15% storage losses.
8. Cowpea consumption in Nigeria (8) is projected from the 1983-1987 base of 636,100 MT, assuming that consumption expands at 3.6% per annum from the base of 1987. The assumptions underlying this calculation are the same as those used in section 3.7.
9. The projected Nigeria consumption gap (9), relative to 1987, is calculated as projected consumption (8) less available supplies (7). Positive numbers indicate a deficit or consumption gap, while negative numbers indicate a surplus.

We forecast the cowpea consumption gap for 1992 and 1997 under two scenarios: 1) Cowpea production in Niger and Nigeria increases at the 1975-88 growth rate of 1.0% per annum for Niger and 0% for Nigeria; 2) Cowpea production is assumed to attain record levels for Niger (1988) and Nigeria (1987) in 1992 and 1997. This exercise holds relative prices, technology, the effectiveness of input delivery systems, and tastes and preferences constant. Despite these restrictive assumptions and the fact that historical data are used in making linear extrapolations for cowpea production and consumption, the findings are instructive.

If cowpea production only increases as fast in Niger as it did from 1975 to 1988—at 1.0% per annum—and if Nigerian production stays flat, there will be significant consumption gaps of 113,100 and 240,600 metric tons in Nigeria in 1992 and 1997. If cowpea production rises to the levels of the best production years in Niger (1988) and Nigeria (1987) in 1992 and 1997, there will be a highly negative consumption gap in 1992 and a mildly negative consumption gap in 1997. That is, cowpeas will be in surplus in both years, depressing prices and incentives for Niger to export.

If technology and the effectiveness of input delivery systems are indeed held constant, reality will more likely correspond to the first scenario, and there will probably be a consumption gap relative to 1987. This would put upward pressure on cowpea prices in Nigeria, a factor that would benefit Niger if continued depreciation of the Naira tends to make Niger cowpeas higher priced, ceteris paribus, in Nigerian currency terms. Niger

exporters are most likely price-takers, despite allegations of the oligopolistic nature of the formal cowpea trade. Niger is unlikely to be able to affect Nigerian cowpea prices, even though Niger's exports comprised nearly 30% of estimated marketed surplus during the 1983-87 period (assuming that 50% of the cowpeas grown in Nigeria are marketed).

The potential magnitude of the cowpea consumption gap in Nigeria underscores the importance of supply responsiveness. Niger has expanded production of cowpeas steadily since the 1960s by increasing area under cultivation. The potential for further extensification or for shifting of land and resources out of cereal or other crop production is unknown. Producers' preference to satisfy a certain proportion of their cereal requirements through own production, as well as increasing population density and cultivation of arable land in southern Niger, suggest that the potential for expanding area cultivated to cowpeas may be limited. Niger will likely have to intensify production, increasing input use and improving agronomic practices, in order to obtain a significant supply response.

Niger will be in a better position to respond to probable expanding market opportunities in Nigeria by improving cowpea production technology and producers' access to seeds, pesticides and fertilizers. This scenario reinforces the importance of ongoing research on cultivar development, improved agronomic practices, and animal traction. It also suggests that research resources can be wisely allocated to improved storage, where significant (but unquantified) losses take place. Finally, input distribution systems will need to be made far more effectively than they are currently in order to ensure broader and more timely access to fertilizers and pesticides.

Table 21

Projected Cowpea Consumption Gap in Nigeria

(all figures in thousand metric tons)

----- Nigeria -----									
	Niger Production (1)	Niger Exports (2)	Production (3)	Own Supply (4)	Imports (5)	Total Supply (6)	Availab. for Cons. (7)	Projected Consumption (8)	Projected (Relative Cons. Gap to 1987) (9)
Five-Year Average, 1983-87	216.7	149.1	668.2	568.0	180.4	748.4	636.1	636.1	0.0
Hist. Growth Rates									
1975-1987 (88)	1.6%		-2.2%					3.6%	
1980-1987 (88)	-1.2%		-1.0%						
Projections for 1992									
Assuming Hist. Prod. Growth	227.8	152.5	668.2	568.0	192.1	760.1	646.1	759.2	113.1
Using Record Prod. Levels	343.0	250.5	887.0	754.0	290.1	1044.0	887.4	759.2	-128.3
Projections for 1997									
Assuming Hist. Prod. Growth	239.4	164.7	668.2	568.0	214.9	782.8	665.4	906.0	240.6
Using Record Prod. Levels	343.0	236.0	668.2	568.0	266.2	854.1	726.0	906.0	180.0

Sources : Production data from Niger and Nigerian government agricultural ministries.

Note : The growth rate for cowpea consumption is a projected growth rate, assuming a 3.6% per annum population growth rate, a 1.0% per capita income growth rate, and an income elasticity of demand for cowpeas of 0.23.

4. RECOMMENDATIONS

An Action Plan for Promoting Development of the Cowpea Subsector for USAID/Niger Consideration

USAID actions to strengthen the cowpea subsector in Niger need to be sequenced and coordinated to be most successful. The Action Plan focuses on four interrelated activities: policy reform; applied marketing, processing and consumption research; integration of post-harvest research into programs for developing improved cowpea varieties; and marketing system innovations.

4.1 Policy Reform

The highest priority measures in promoting the cowpea subsector in Niger and cowpea exports to Nigeria are regulatory and policy reforms. The GON must continue to remove barriers to entry into the cowpea trade and to export of cowpeas from Niger, fostering as competitive, efficient and progressive a marketing system as possible. As additional reforms and streamlining of regulations are carried out, the GON and USAID should consider monitoring the impact of these reforms on participation in the marketing system, marketing flows, volumes and costs, and cowpea prices at different levels of the marketing system. Further applied research could also strengthen understanding of cowpea consumption patterns and preferences, as well as current processing methods and costs. This applied research would generate useful, policy relevant insights that could help inform the marketing liberalization process and design and monitoring of any processing innovations or cowpea promotional campaigns.

4.1.1 Removal of the Export Tax

The principal recommendation of the first phase of the cowpea marketing study was the removal of the export tax on cowpeas. It was pointed out that elimination of the tax would stimulate competition as many more traders entered the official market, thereby reducing the high returns enjoyed by the few traders operating in the formal sector, particularly during certain periods of the year. Elimination of the tax would also allow unofficial traders to conduct more efficient and larger-scale transactions. The likely increase in official exports would offset the modest revenue lost from elimination of the export tax by generating more economic activity subject to direct taxation. Further, elimination of the tax would tend to make cowpeas from Niger more competitive in Nigerian markets, thus strengthening Niger's comparative advantage. This is particularly important in view of the successive devaluations of the Naira in recent years.

Since the export tax was removed by the Government of Niger in October 1988, the GON now needs to focus on other policy and regulatory reforms which further liberalize the cowpea trade.

4.1.2 Export Trade Liberalization

The top policy priority is to foster competitiveness and unrestricted entry into cowpea marketing in Niger. This can be done by allowing anyone to export cowpeas. Export licensing procedures need to be eliminated or greatly streamlined. The 483,000 CFA patente or export permit should be removed or significantly reduced.

Niger's long-term development strategy has increasingly aimed at removing market imperfections and adopting policy reforms that promote exports in line with the country's comparative advantage. Elimination of SONARA's monopoly on cowpea exports was a step in this direction, although the decision was insufficiently publicized by the government. Many farmers and traders were either unaware of the decision or if aware, did not believe it was true. This had begun to change in late 1988, as the Centre Nigérien du Commerce Extérieur (CNCE) and regional Chambers of Commerce were publicizing recent GON measures to liberalize cowpea marketing. A second important step was the March 1987 decentralization of most steps in the process of obtaining official export authorization and the removal of the pre-authorization to practice commerce, once required for all traders. Finally, the abolition of the export tax in October 1988 was a key measure for increasing participation in the formal export trade.

Despite these reforms, obtaining the necessary approvals and documentation to export cowpeas remains costly and time-consuming, serving as a disincentive to enter the formal sector for all but the wealthiest traders. Further progress can be made by (1) reducing control on the movement of goods between the production areas in Niger and consumption centers in Northern Nigeria, and (2) easing the costly and cumbersome export licensing procedures or eliminating them entirely. The process should be simplified for the small trader by reducing the amount of the patente, and eliminating both the subscription to the CNUT (which at present has to be paid annually in Niamey) and the purchase of export licenses from the prefecture or regional offices of the Ministry of Commerce. The licenses have not been successful in controlling the flow of restricted goods; nor is there any control of amounts exported. By substantially reducing the amount of the export patente, overall GON revenues will likely increase as more traders enter the formal sector.

The current regulatory system discourages competition and encourages illegal rent-seeking. Eliminating or streamlining cost regulations would lower marketing costs and increase the competitiveness of Niger cowpeas in Nigerian markets. Increased competition would also encourage exporters to search out cost-reducing innovations (in transport, storage and perhaps processing).

4.1.3 Initiate Bilateral Trade Negotiations with Nigeria

Cowpea imports from Niger are currently the exclusive right of two large Nigerian firms. High-level, bilateral negotiations might lead to an easing of this restriction and enhance Niger traders' bargaining power by opening the market to a wider range of contacts. Removing this restriction would also reduce the marketing costs of exports in the informal sector by eliminating the risk of confiscation or the need for payment of gratuities to customs officials in Nigeria.

4.2 Applied Research on Cowpea Marketing and Consumption

An effective rapid appraisal is a useful tool for identifying knowledge gaps and emerging policy and research issues, for evaluating the quality and reliability of available data sources, and for suggesting promising avenues of further applied research (see Holtzman et al., 1988). RA cannot address all researchable issues in adequate depth. This RA has focused on policy and regulatory constraints, and it has hopefully been instrumental in demonstrating the adverse impacts of the cowpea export tax and in encouraging the GON to remove the tax. Further research on cowpea consumption and post-harvest handling and processing issues could, over the longer term, also have beneficial impacts.

Applied research on the cowpea subsector could be carried out sequentially, with later stages depending on USAID's success in promoting further policy and regulatory reform. Initially, research should focus on developing an in-depth understanding of two or more urban (and surrounding departmental) markets for cowpeas in regions of significant cowpea production. Maradi and Zinder are promising sites, due to their large populations, vibrant commerce, strong trade links to Nigeria, and proximity to key cowpea production zones.

4.2.1 Marketing Data Collection

A rapid appraisal is no substitute for on-going data gathering and analysis of cowpea prices at different points in the marketing chain, marketing costs, the direction and magnitude of trade flows, and cowpea production and consumption in Niger. AMIS

recommends establishing a price (and marketed quantity) data collection and analysis system in Maradi and Zinder (and perhaps several nearby villages in production zones) for a handful of strategic agricultural commodities. This would likely include cowpeas, millet, sorghum, peanuts, beef, small ruminant meat and perhaps cowpea (and peanut) hay. This effort could be part of the ASDG or entirely independent. The data collection and analysis system would be designed with the lessons of the Integrated Livestock Project and the ASDG in mind. The price data collection and analysis system could be managed by a government agency (departmental Ministry of Agriculture unit) or by a private firm. If good rapport were established with cowpea wholesalers and exporters, price and export volume data could be indirectly collected for the Nigerian market. Reported exports would, of course, be only part of total flows, but most likely an important part, as many of the largest volume traders are based in Maradi and Zinder. Depending on the care used in constructing the sample frame of cowpea traders, survey findings could perhaps be extrapolated to the regional level.

4.2.2 Monitoring Cowpea Trader Practices

As the GON begins to liberalize the cowpea trade, it would be useful to monitor the operations, traded volumes, acquisition and sales prices, storage practices and costs, and marketing costs and margins of a small sample of cooperative wholesale traders based in Maradi and Zinder over at least one marketing season. In the West African context, it is difficult to obtain sensitive cost and return information in a first (or even a second or third) interview. Setting up a monitoring system calls for a cautious, carefully sequenced information-gathering strategy. Initial interviews can win over traders if sensitive topics are avoided and traders are allowed to express their perceptions of problems, constraints and opportunities.

It is important to note that traders who handle cowpeas are also trading other agricultural and non-agricultural commodities. As a result, applied research needs to be conducted on the full range of their trading activities. This research would be useful in understanding trader perceptions of opportunities and commodities yielding the highest return during different periods (seasons or years). Their perceptions of constraints is also critical, particularly as they relate to policy and regulatory barriers and the monetary and transactions costs that these impose.

An important issue to monitor empirically is the extent to which participation (entry) and volume (per current participant) increase with the removal of the export tax and with the relaxation of barriers and the reduction of costs associated with participation in the formal trade. The degree to which participation and volume increase

may be anticipated with excessive optimism. Policy and regulatory reform are likely necessary but not sufficient conditions for expansion of cowpea exports from Niger. Moreover, the advantages of participating in the formal sector may be overstated. If formal sector participation requires transferring funds through the formal banking system at the overvalued naira/c^fa exchange rate, it represents a decided disadvantage to Niger exporters.

4.2.3 Cowpea Processing Survey

An inventory of past and current cowpea processing, both manual and mechanized, in Maradi and Zinder would address a number of important questions. Are multi-purpose dehullers and grinders used to process cowpeas as well as millet, sorghum and peanuts? If so, what is the throughput by month/season, who brings cowpeas for processing, how are the processed products used (for home consumption, for preparation for vending), and how much do users pay for dehulling and grinding? Do rural or urban women process cowpeas manually for sale to other households or to food preparers/vendors? If so, what quantities do they process and how much do they charge? Do cowpea consumers prefer products processed manually or mechanically?

This effort should also include monitoring of the operations of a small sample of preparers and vendors of processed cowpea products in Maradi and Zinder over several months to one year. During monthly in-depth interviews, data could be collected on their volume of purchases of unprocessed or processed cowpeas, suppliers, prices paid, sales, prices received, buyers/sales locations, revenues, costs and other key variables.

4.2.4 Urban Household Consumption Survey

AMIS also recommends periodic interviews with a representative (though not necessarily randomly selected) sample of urban households in Maradi and Zinder, during which data on consumption patterns and preferences could be gathered. The Instituto Italo-Africano is conducting household budget and expenditure surveys in Niamey, which include collection of cowpea consumption data. An INRAN/IFPRI research project is also gathering data on rural household transactions of staple crops and livestock in Tillabery Department. Similar, though perhaps less elaborate, data collection efforts could be initiated in Maradi and Zinder, which are located in more important cowpea production zones and serve as vibrant commercial centers. The consumption data collection could later be supplemented by mini-market tests of selected cowpea products, provided policy reforms had been successfully negotiated and processing innovations had been initiated.

4.2.5 Further Research on Farmer Decision-Making vis-a-vis Cowpea Production and Marketing

Further research on farmer decision-making concerning cowpea production and marketing is justified due to the major role played by cowpeas in the Niger rural economy. As the major (and often only) cash crop, cowpeas are an important source of rural revenues and contribute to financing both on-farm and nonagricultural activities.

Farm-level survey research is needed to determine the extent to which farmers are responsive to changes in cowpea prices, and more generally to understand how resources are allocated by farmers to competing agricultural and non-agricultural production activities. Further information is also needed on farmer decision-making regarding marketing, storage, and consumption of cowpeas. The aforementioned INRAN/IFPRI project is conducting in-depth, farm-level surveys in villages of the Department of Tillabery which will generate important new microeconomic knowledge and insights for Western Niger. This type of survey research could later be extended to other parts of Niger.

4.3 Assessing the Economic Viability of Improved Cowpea Varieties and Production Packages

New cowpea production technologies currently being tested by ICRISAT, INRAN (Farming Systems Unit), and the Agricultural Production Support Project (APS) need to be evaluated in order to ascertain their cost-effectiveness for farmers. The evaluation of agricultural technical packages undertaken by USAID/Niger in 1983 should be updated to estimate costs and returns of cowpea production, including hired labor costs, which are an important cost category during peak periods yet not incorporated in the 1983 and prior analyses. The 1983 study concluded that partial or full adoption of the improved technical package for cowpeas was economically beneficial for farmers. A major assumption of the analyses undertaken, however, was that no hired labor was necessary. Informal interviews with farmers during this rapid appraisal suggest that this is an unrealistic assumption; farmers do hire seasonal wage laborers during peak periods.

In addition, the economic viability of improved cowpea production packages needs to be evaluated with and without animal traction. INRAN/ICRISAT have developed and tested varieties which have been judged successful on farms possessing animal traction. Since most rural households in Niger do not use animal traction, new cowpea varieties will need to be economically viable in hand-hoe production systems as well if the varieties are to be disseminated widely.

4.4 Integration of Post-Harvest Research into the On-going Efforts to Develop Improved Cowpea Varieties

There is a need to integrate post-harvest research into the on-going efforts to develop improved cowpea varieties in Niger. Scientists involved in cowpea breeding and production (INRAN/ICRISAT and elsewhere) realize the importance of the storage, processing and eating qualities of the resulting cultivars, and are in some cases attempting to include these factors in their breeding considerations. These efforts appear to be rather informal and qualitative compared to the rigor of their agronomic studies. It is, of course, unreasonable to expect plant breeders and agronomists to conduct research in food science, and the need for collaboration is evident. Given the limited post-harvest expertise in Niger, such collaboration might have to involve scientists in neighboring countries (especially Nigeria) or the U.S.

Niger lacks a research base, including scientists, laboratories and library collections, for improving cowpea storage and processing and promoting cowpea consumption. USAID could consider funding at least a modest program of food technology at the University of Niger or in collaboration with the INRAN/ICRISAT cowpea breeding, agronomy and dissemination program.

4.5 Marketing System Innovation

The current marketing system, particularly the formal channel, appears to have uncompetitive and unprogressive tendencies. Entry into the formal export trade has been restricted to a small group of well-capitalized and politically well-connected traders. There is little or no incentive for these traders to innovate in cowpea marketing and processing under these circumstances. Cowpea trader budgets presented in Appendix H suggest potential for quite high levels of net returns during certain periods of the year (February-March). Removing export taxes and entry barriers is likely to foster cost-reducing innovations.

One possible innovation for reducing marketing costs might be processing cowpeas in Niger before export. This would lower transport costs by approximately 10-20%, assuming 10-20% losses during decortication. Since transport costs are such a significant component of marketing costs in African countries,¹ particularly in the long

1. See Ahmed, Raisuddin and Narendra Rustagi, "Marketing and Price Incentives in African and Asian Countries: A Comparison," in Elz, Dieter (editor), Agricultural Marketing Strategy and Pricing Policy, a World Bank Symposium, 1987.

distance Sahel-to-coast trade, this would represent an important saving and would increase the competitiveness of Niger cowpeas in the Nigeria market.

It is important to note that processing of cowpeas prior to export could potentially add costs to marketing of Niger cowpeas in Nigeria if:

1. Nigeria imposed a tax on importation of processed products.
2. Improved bagging and packaging required for cowpeas destined for export markets proved too costly.
3. Processed cowpeas had a relatively short shelf life, leading to high rates of spoilage loss.
4. Processing costs in Niger were high due to factors such as low throughput, high operating costs of processing units, or high losses during processing.

If the policy reforms in 4.1.2 and 4.1.3 were successfully implemented, USAID/Niger could consider providing resources for cowpea processing experiments, preferably through private entrepreneurs. Investments in cowpea decorticating and grinding machinery in urban areas near cowpea production zones could be tested as a pilot innovation. Locating processing units in urban areas would have two principal advantages, despite transport and handling costs incurred in moving cowpeas from rural assembly points to town. First, the processing machinery could be powered by electricity, rather than diesel engines, which are more costly to maintain and repair. Second, a large proportion of processed output, particularly initially, could be sold to urban households and food preparers/vendors. The mechanical units could process cowpeas into cowpea flour sold on the local urban market or bagged and shipped to Nigerian markets. The costs and returns of several pilot units could be rigorously monitored, as could the acceptability of mechanically processed cowpeas in urban markets. Providing incentives for wholesale traders to invest in processing units would be one way to encourage greater vertical integration and better vertical coordination in the cowpea subsector. Nigerian entrepreneurs might also prove to be an important source of capital.

The Bean and Cowpea CRSP experience in collaboration with the University of Nigeria at Nsukka in southern Nigeria could serve as a model for introducing mechanized processing in Niger. U.S. food technologists at the University of Georgia and Nigerian food technologists at Nsukka could help in establishing the processing units and return periodically to monitor progress. An economic monitoring information system could be designed and established by AMIS. Collaborating scientists from the national Nigerian University and INRAN/ICRISAT would be asked to participate in all stages of the research, design and monitoring of this experiment. At a minimum, two processing

units could be installed in Maradi and Zinder. To the extent that cowpea prices, marketed flows and the acceptability and competitiveness of processed Niger cowpea products in Nigeria needed to be monitored, Nigerian researchers at, say, Ahmadu Bello University in Zaria could be invited to collaborate.

Another possible experiment would be to assess thoroughly the potential of the SOTRAMIL plant in Zinder for producing cowpea meal (kosai) and the depth of the local market for such a product. Surveys have shown that there is a sizeable market in Nigeria. The previous difficulties at that plant in producing acceptable cereal flours for traditional and possibly Western-style foods indicate fertile areas for research in the food microbiology, chemistry, and engineering associated with these products. An example is the possible utilization of TN 88-63 for producing cowpea flour. It is sold at a discount due to its small size, dark eye and poor texture/flavor, but its handling and sensory disadvantages may well be obviated in an industrial process. Another area suggested by the customary use of different size fractions of millet for producing toah and other dishes is an investigation into the functionality of cowpea meal fractions of different particle-size for producing moin-moin, akara, and other products. (This may be incorporated into the Bean and Cowpea CRSP research.) In addition to technical expertise, it is possible that businessmen (e.g., Dr. Ladipo of Lasabi Mills) from southern Nigeria, where the population and the demand for cowpea products are large, might be interested in investing in this facility with the intention of exporting the products to their regions.

4.6 Strengthening Local Institutional Capacity

Over the medium to long term, USAID/Niger needs to think carefully about strengthening local institutional capacity to do applied research on cowpea marketing, processing and consumption. This capacity need not always reside in public sector agencies, as it has historically in many African countries. Private research and analysis groups or firms may be equally capable of doing certain types of applied research, with minimal red tape and bureaucratic obstruction.¹ Moreover, it may be easier for private researchers to do effective applied research in Northern Nigeria. Probably a combination of public and private institutions would be the best mix. Public or international institutions that could and should participate are the Ministry of Agriculture, INRAN, ICRISAT and the national university. Their comparative advantage in research lies on

1. As an example, AMIS is working closely with a private consulting firm in Nepal in designing and implementing a program of applied research on the marketing of high-value commodities produced in hill zones of Nepal.

the production or supply side. Outside institutions and firms such as the Bean and Cowpea CRSP and AMIS could assist in providing technical and advisory support in the areas of cowpea processing and marketing, providing needed complementary research on the demand side. Clearly, food technologists and agricultural marketing economists need to work closely with plant breeders, agronomists and production economists in promoting development of the cowpea subsector.

4.7 Conclusion

It is important to emphasize that policy and regulatory reforms will have to be undertaken before significant resources are invested in marketing innovations such as pilot cowpea processing schemes. USAID/Niger is advised to encourage the GON to lift the remaining barriers to free entry in the formal cowpea trade. Removal or reduction of the annual export permit (patente) would lower marketing costs in the formal channel and induce greater participation in the formal trade. It will also be important for the GON to negotiate broader Nigerian participation in the cowpea trade with the Government of Nigeria. Restricting the right to import cowpeas from Niger to two Nigerian organizations will not foster a competitive and innovative cowpea subsystem.

As policies are reformed and regulations streamlined, the GON and USAID would be well-advised to monitor changes in the organization, operation, volumes, and costs and prices associated with the cowpea trade to assure that liberalization leads to the development of a more competitive and efficient marketing system. It may also be possible to expand cowpea consumption in Niger, but more applied research needs to be conducted on cowpea consumption patterns and processing methods and costs. Finally, research on mechanized processing of cowpeas, improved cowpea storage, and consumer acceptance of different cowpea food products could have a potentially high payoff over the medium to long term.

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APPENDIX A

APPENDIX A

COWPEA AREA, YIELD AND PRODUCTION IN NIGER, 1960-1988

Year	Area (in hectares)	Yield ¹ (in kgs/ha)	Production (in 000 tons)
1960	363,800	120	43,685
1961	404,700	112	45,490
1962	454,000	126	57,350
1963	482,000	131	63,301
1964	423,100	141	59,450
1965	432,200	109	47,320
1966	605,000	112	67,595
1967	669,950	115	77,101
1968	738,490	107	78,760
1969	1,067,980	93	99,678
1970	995,100	76	75,710
1971	999,600	91	91,240
1972	920,530	156	143,965
1973	822,800	124	101,998
1974	918,720	144	132,450
1975	839,300	260	218,500
1976	837,200	258	216,000
1977	726,300	284	206,830
1978	952,400	285	271,490
1979	944,700	322	303,780
1980	1,105,100	243	268,755
1981	1,197,632	235	281,617
1982	1,427,948	235	281,744
1983	1,608,535	169	271,349
1984	1,512,799	129	194,843
1985	1,566,199	74	115,332
1986	1,590,541	187	292,935
1987	---	---	209,000
1988	---	---	343,000(est)

¹Yield figures have been rounded to the nearest kilogram.

Source: République du Niger, Ministère de l'Agriculture, Rapports annuels des statistiques agricoles, various volumes.

COMPEA PRODUCTION IN SELECTED WEST AFRICAN COUNTRIES

1972-87

(in '000 metric tons)

Year	World	Africa		West Africa		Nigeria		Niger		Cameroon		Burkina Faso		Senegal		Benin	
		MT	% World	MT	% World	MT	% W. Afr.	MT	% W. Afr.	MT	% W. Afr.	MT	% W. Afr.	MT	% W. Afr.	MT	% W. Afr.
1972	1019.0	936.0	92%	768.0	75%	560.0	73%	144.0	19%	56.6	7%	37.0	5%	11.0	1%	24.2	
1973	931.0	855.0	92%	704.0	76%	550.0	78%	92.0	13%	63.3	9%	43.9	6%	16.0	2%	19.4	
1974	1116.0	1038.0	93%	852.0	76%	650.0	76%	133.0	16%	68.7	8%	42.2	5%	23.0	3%	13.5	
1975	1395.0	1317.0	94%	1149.0	82%	850.0	74%	219.0	19%	75.0	7%	50.7	4%	21.0	2%	---	
1976	1421.0	1330.0	94%	1167.0	82%	880.0	75%	216.0	19%	80.0	7%	44.4	4%	16.0	1%	23.3	
1977	1256.0	1183.0	94%	1031.0	82%	750.0	73%	207.0	20%	85.0	8%	50.3	5%	12.0	1%	25.2	
1978	1389.0	1298.0	93%	1148.0	83%	800.0	70%	271.0	24%	90.0	8%	51.8	5%	13.0	1%	38.4	
1979	1453.0	1367.0	94%	1256.0	86%	830.0	66%	303.0	24%	95.0	8%	95.0	8%	14.0	1%	37.1	
1980	1427.0	1350.0	95%	1234.0	86%	850.0	69%	260.0	21%	98.0	8%	95.0	8%	14.0	1%	28.4	
1981	1445.0	1367.0	95%	1243.0	86%	850.0	68%	271.0	22%	99.5	8%	95.0	8%	17.0	1%	27.8	
1982	---	---	---	---	---	616.0	---	281.7	---	---	---	---	---	28.7	---	29.1	
1983	---	---	---	---	---	664.0	---	271.3	---	---	---	---	---	12.6	---	28.6	
1984	---	---	---	---	---	447.0	---	194.8	---	---	---	---	---	14.0	---	42.4	
1985	---	---	---	---	---	611.0	---	115.3	---	---	---	---	---	15.8	---	39.1	
1986	---	---	---	---	---	732.0	---	292.9	---	---	---	---	---	65.9	---	40.4	
1987	---	---	---	---	---	887.0	---	209.0	---	---	---	---	---	54.3	---	34.9	

Sources: Niebe et Voandzou: Une Perspective pour le Developpement du Commerce Regional en Afrique de l'Ouest, Centre du Commerce International, 22 Octobre 1982.

1982-87 Data : Central Bank of Nigeria; Ministere de l'Agriculture, Republique du Niger; Ministere du Developpement Rural, Republique du Senegal; Institut National de la Statistique et de l'Analyse Economique, Benin

APPENDIX B
SELECTED PRICE DATA FOR NIGER COWPEAS

Summary Cowpea Price Statistics, 1961-1985

(all prices in FCFA per kilogram unless otherwise noted)

Year	Cowpea Prices						Cowpea/Grain Price Comparisons						
	Nominal Retail Price, Niamey	Official Producer Price	Official Price as % Open Mkt Price	Harvest Price to Soudure Change (in %)	Niamey CPI 1975=100	Deflat. Cowpea Prices 1975=100	Constant Cowpea Prices (1987 Prices)	Nominal Millet Price, Niamey	Nominal Sorghum Price, Niamey	Constant Millet Prices (1987 Prices)	Constant Sorghum Prices (1987 Prices)	Relative Price of Cowpeas to Millet	Relative Price of Cowpeas to Sorgh.
1961	26							21					
1962	27			50				19				1.24	
1963	24			29				17				1.42	
1964	18			15				16	18			1.41	1.33
1965	20			57	57	35		17	16			1.13	1.13
1966	34			157				33	30			1.18	1.25
1967	25			-7				21	21			1.03	1.13
1968	19			-3				16	15			1.19	1.19
1969	28			133				33	24			1.19	1.27
1970	29	20		38	69	42	108	33	24			0.85	1.17
1971	45	20	89	79	72	63	161	25	23	93	89	1.16	1.26
1972	60	25	71	15	79	76	196	28	26	100	96	1.61	1.73
1973	72	40	58	56	89	81	209	32	30	105	101	1.88	2.00
1974	90	40	59	44	92	98	252	51	46	148	127	1.41	1.57
1975	74	40	77	4	100	74	191	40	41	112	119	2.25	2.20
1976	64	30	79	-7	124	52	133	38	40	98	106	1.95	1.85
1977	82	30	69	1	152	54	139	51	54	106	116	1.25	1.19
1978	123	45	43	68	168	73	189	64	67	109	117	1.28	1.22
1979	102	45	68	-4	180	57	146	90	86	138	136	1.37	1.43
1980	124	45	64	36	198	63	162	92	92	132	136	1.11	1.11
1981	246	90	36	187	247	100	257	97	89	126	120	1.28	1.39
1982	246	85	59	33	273	90	232	178	157	186	169	1.38	1.57
1983	203	90	62	-4	266	76	197	167	152	158	148	1.47	1.62
1984	266	120	59	133	288	92	238	113	96	110	96	1.80	2.11
1985	305			95	285	107	276	184		165			
1986	210			8	276	76	196	166		150			
1987	147			46	258	57	147	74		69			
1988	194				256	76	196	63		63			
								91		92			

Notes : Niamey retail prices are unweighted annual averages.

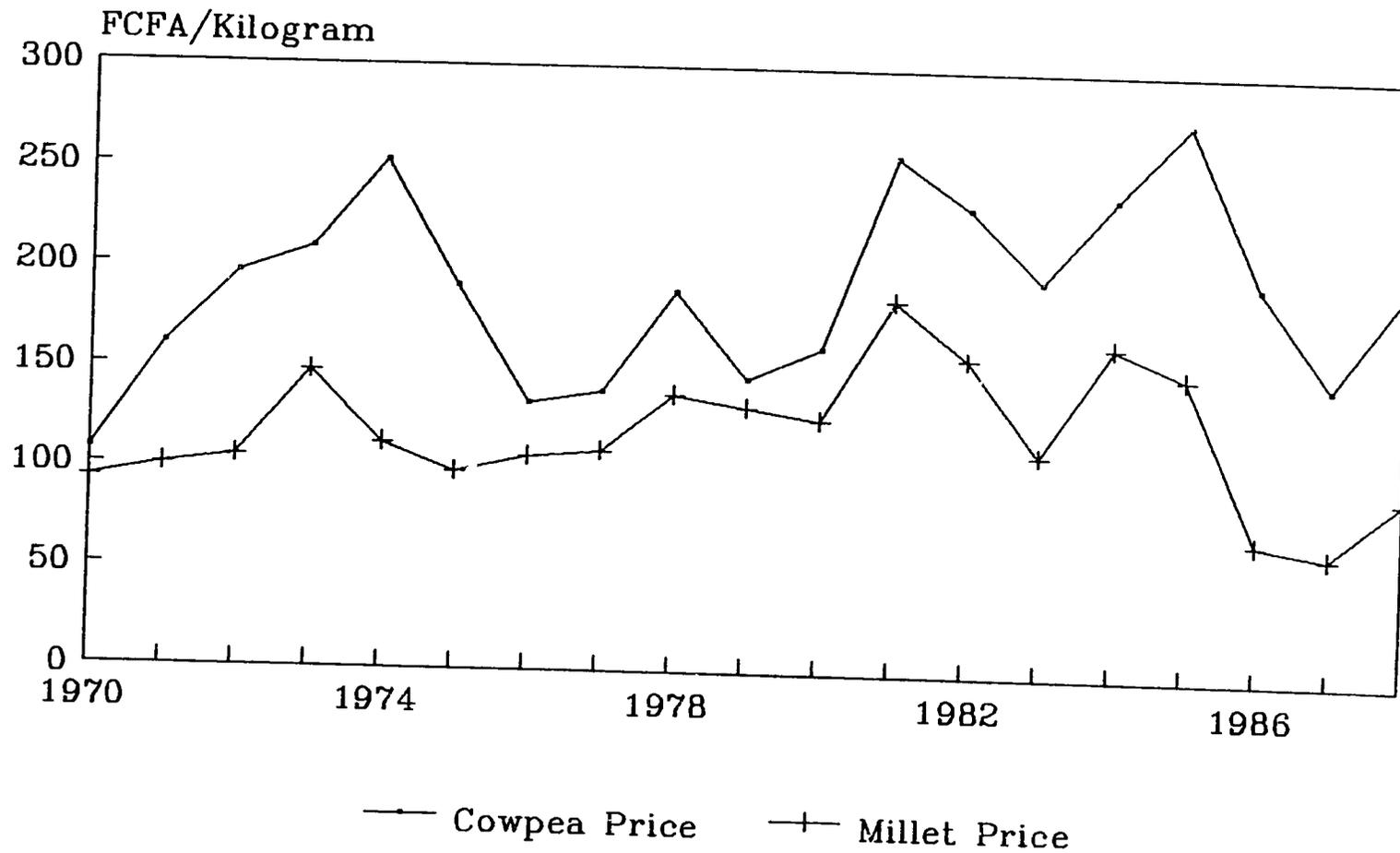
: The open market price is calculated from the average Niamey retail price during the agricultural year (September-August). It is assumed that Niamey retail prices reflect a 65% markup over the farmgate price.

: Harvest to soudure price changes are calculated as the ratio of the average for the months of October-December for the previous year to the average for the months June-August for the year indicated.

: Average annual cowpea prices are calculated from only eight months of data in each of the years 1987 and 1988.

Sources : E. Berg Associates reports; Ministry of Planning.

Real Cowpea and Millet Retail Prices, Niamey, 1970-1988



Real prices expressed in 1987 constant price terms.

COWPEA MONTHLY RETAIL PRICES, NIAMEY, 1961-1988

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVG
1961	20	20	20	22	32	36	30	27	27	31	24	17	26
1962	17	18	20	22	41	38	36	34	35	18	20	25	27
1963	22	27	22	23	24	28	26	27	29	21	15	18	24
1964	18	16	15	21	18	19	24	19	20	16	15	15	18
1965	14	14	14	17	19	19	28	25	28	21	20	26	20
1966	28	24	24	24	23	40	56	76	24	34	28	24	34
1967	22	20	21	25	24	20	27	33	35	23	20	24	25
1968	23	19	15	20	22	24	19	22	19	17	14	18	19
1969	24	25	23	21	24	43	40	31	33	23	26	22	28
1970	22	24	29	25	31	28	35	35	33	34	25	25	29
1971	25	36	41	49	27	56	44	50	41	63	56	50	45
1972	56	71	51	60	58	60	62	73	67	56	56	43	60
1973	53	56	58	64	71	97	76	72	86	91	60	82	72
1974	54	44	68	96	86	76	91	168	167	116	57	54	90
1975	52	98	82	98	72	78	95	62	74	63	57	61	74
1976	53	61	71	75	71	63	50	56	37	85	80	75	64
1977	62	74	59	76	78	80	82	75	133	80	93	87	82
1978	88	90	109	104	159	148	167	122	139	153	100	100	123
1979	82	96	96	101	100	113	114	114	103	109	95	104	102
1980	106	117	113	114	122	130	133	157	135	112	119	133	124
1981	141	158	181	211	193	308	409	326	334	230	225	234	246
1982	235	208	211	212	218	279	336	300	280	263	213	193	246
1983	218	197	217	245	237	201	235	205	211	182	145	142	203
1984	150	172	200	264	328	320	448	320	386	213	195	197	266
1985	234	262	262	319	326	378	448	353	341	292	243	202	305
1986	224	225	225	197	287	286	265	243	188	133	125	118	210
1987	119	120	100	135	127	170	184	191	178				147
1988				194	217	213	221	232	205	141	130		194

Source: same as Appendix A.

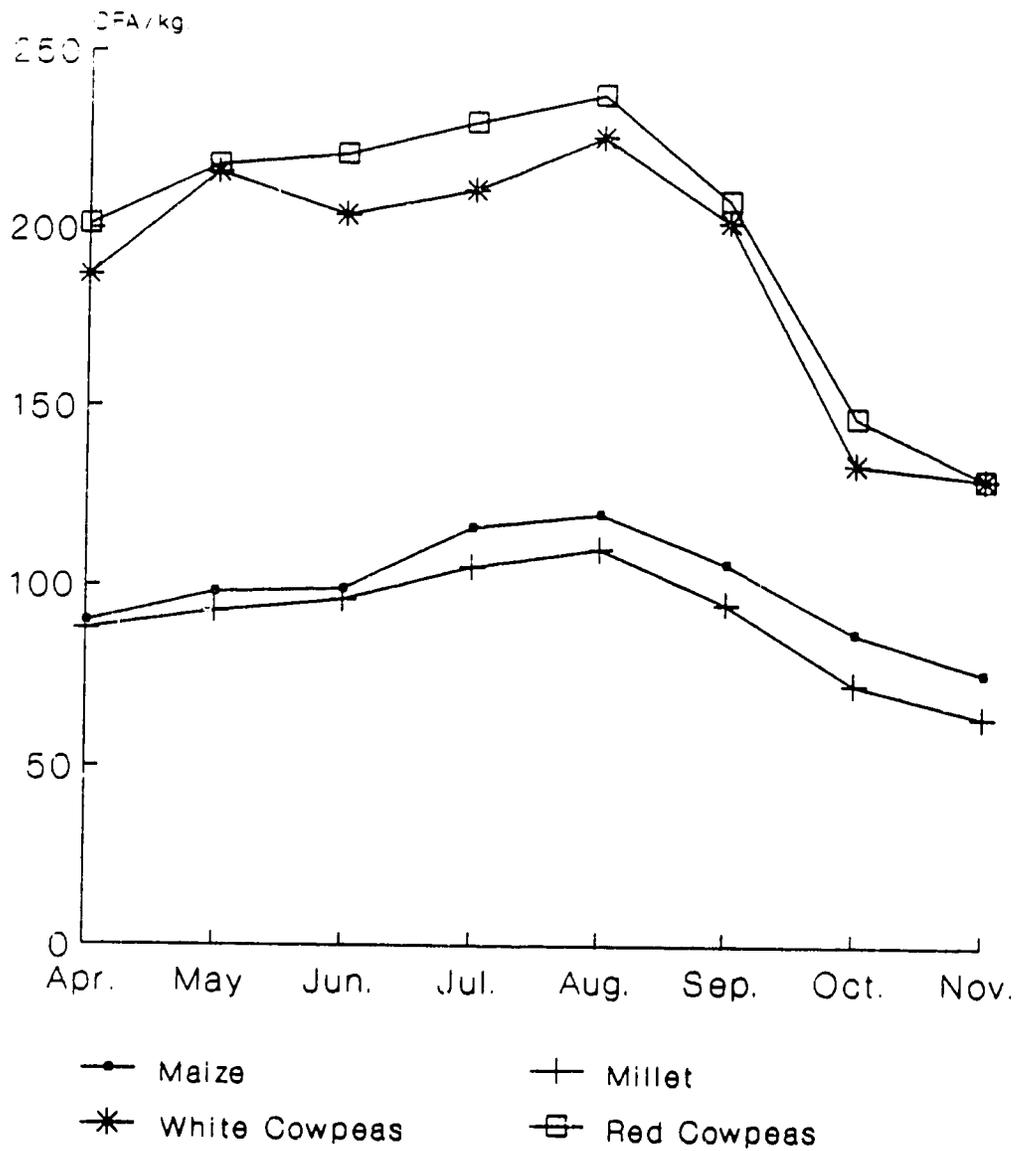
WEEKLY NIAHEY MARKET PRICES FOR MAIZE, MILLET AND COWPEAS, APRIL-NOVEMBER 1988

(CFA/Kg.)

Week of	Maize	Millet	White Cowpeas	Red Cowpeas
17 April	90	87	190	205
24 April	89	88	184	196
Mo. Mean	90	88	187	201
01 May	98	95	221	---
08 May	99	91	221	---
15 May	100	91	220	224
22 May	99	94	215	215
29 May	96	94	207	216
Mo. Mean	98	93	216	218
05 June	96	93	206	220
12 June	97	97	206	223
19 June	97	96	220	220
26 June	107	96	182	---
Mo. Mean	99	96	204	221
03 July	109	99	190	220
10 July	108	103	200	225
17 July	120	107	207	233
24 July	123	109	221	234
31 July	121	109	235	238
Mo. Mean	116	105	211	230
07 August	121	110	217	239
14 August	119	110	221	237
21 August	120	110	225	237
28 August	119	108	240	237
Mo. Mean	120	110	226	238
04 September	114	103	236	238
11 September	110	92	240	235
18 September	---	---	---	---
25 September	95	89	130	150
Mo. Mean	106	95	202	208
02 October	92	76	134	152
09 October	92	74	125	159
16 October	86	75	135	147
23 October	84	74	140	140
30 October	81	68	134	136
Mo. Mean	87	73	134	147
06 November	77	64	130	130
13 November	75	63	130	130
Mo. Mean	76	64	130	130

Source: Republique du Niger, Ministere de l'Agriculture et de l'Environnement
 Direction des Statistiques Agricoles et de l'Environnement

WEEKLY NIAMEY MARKET PRICES FOR MAIZE,
MILLET AND COWPEAS, APRIL-NOVEMBER 1988



Source: Republique du Niger, Ministere
de l'Agriculture et de l'Environnement

APPENDIX C

Areas, Yields and Production of Major Crops in Maradi (1968-1986)

YEAR	AREA (HA)				YIELD (KG./HA.)				PRODUCTION (METRIC TONS)			
	MILLET	SORGHUM	COWPEAS	PEANUTS	MILLET	SORGHUM	COWPEAS	PEANUTS	MILLET	SORGHUM	COWPEAS	PEANUTS
1968	292000	165250	116500	152000	427	330	53	644	124825	54612	6212	97900
1969	296900	152000	134500	164000	599	357	102	705	177705	54300	13700	115600
1970	264500	173600	121900	155000	479	211	99	717	126775	36652	12092	111200
1971	282000	155400	131200	177750	479	512	86	678	135150	79610	11220	120585
1972	297000	147000	143000	176500	343	243	156	531	101900	35720	22280	93700
1973	316642	139571	150357	169000	302	213	83	169	95650	29784	12479	28634
1974	355300	162200	152300	178000	435	314	188	536	154700	50900	28700	95400
1975	268900	264600	149900	207600	295	282	337	146	79200	74500	50500	30400
1976	364075	182690	117769	48857	622	404	414	506	226301	73795	48706	24718
1977	401642	199400	151200	51975	532	421	291	477	213719	83880	44037	24768
1978	451200	244300	213700	81500	497	370	318	514	224220	90480	68020	41915
1979	514900	234300	219800	73100	468	350	322	556	241180	81895	70875	40640
1980	580300	237700	304800	84600	523	331	336	625	303418	78675	102347	52892
1981	612730	412140	425232	982290	432	196	310	527	264970	80800	131773	51844
1982	632690	408840	340442	84178	424	218	272	418	268234	89227	92607	35218
1983	659429	409225	362486	77343	405	209	202	383	267205	35328	73403	29661
1984	632313	403723	358533	65107	272	151	171	185	172264	61071	61353	12054
1985	643451	419582	368206	8716	479	197	19	109	308236	82581	6827	952
1986	661127	360661	377900	30312	442	221	103	276	292428	79625	39060	8366
1987	666276	430283	476552	91649	302	216	118	211	201407	93148	56126	19349
1988	812353	523301	536007	58634	480	323	109	41	390103	174124	57418	2431

Source: Republic of Niger, Department of Agriculture, Maradi Department.

APPENDIX D
NUTRITIVE VALUE OF COWPEAS

Table D.1

Nutritive Value of Cowpea leaves, Pods and Mature Seeds
(100 gm. Portion)

PART	H ₂ O %	Calories	Protein g	Fat g	CHO g	CA mg	P mg	Fe mg	B Carotene mg	Thiamin mg	Riboflavin mg	Niacin mg	Ascorbic Acid mg
Leaf Raw	85.0	44	4.7	.3	8.3	256	63	5.7	2.4	.20	.37	2.1	56
Leaf Dried	10.6	277	22.6	3.2	54.6	1556	348	12.0	27.0	---	---	---	86
Leaf Cooked	89.3	---	3.3	---	---	132	42	4.6	6.53	---	---	---	6
Pod Raw	86.0	44	3.3	.3	9.5	65	65	1.0	.96	.15	.14	1.2	55
Pod Cooked	89.5	34	2.6	.83	7.0	55	49	.7	.84	.09	.09	.8	17
Seed Raw	10.5	343	22.8	1.5	61.7	74	426	5.8	.02	1.05	.21	2.2	---
Seed Cooked	80.0	138	0.3	5.1	13.8	17	95	1.3	.01	.16	.04	.4	---

Source: H.C. Bittensbender, et. al.

Table D.2

Nutritional Value of Cowpeas and Some Other Foods

	Cal	Protein	Fat	Carbo-	Vitamin	Thiamine	Ribo-	Nico-	Ascor-
	100 g	(%)	(%)	hydrate	A	(mg	flavin	tinic	bic
				(%)	(I.U.	100 g)	(mg	acid	acid
					100 g)		100 g)	(mg	(mg
								100 g)	100 g)
Cowpeas	340	22.0	1.5	60	20	0.90	0.15	2.0	0
Millet finger, meal	332	5.5	0.8	76	0	0.15	0.07	0.8	0
Maize meal, 96% extr.	362	9.5	4.0	72	0	0.30	0.13	1.5	0
Rice, slightly milled	354	8.0	1.5	77	0	0.25	0.05	2.0	0
Sorghum flour	353	10.0	2.5	73	0	0.40	0.10	3.0	0
Cassava flour	153	0.7	0.2	37	0	0.07	0.03	0.7	30
Yam, fresh	104	2.0	0.2	24	20	0.10	0.03	0.4	10
Bambarra, groundnut, fresh	367	18.0	6.0	60	0	0.30	0.10	2.0	0
Groundnut, dried	579	27.0	45.0	17	0	0.90	0.15	17.0	0
Soybean	382	35.0	18.0	20	0	1.10	0.30	2.0	0
Fish, sea, lean fillet	73	17.0	0.5	0	0	0.05	0.10	2.5	0
Beef, lean	202	19.0	14.0	0	0	0.10	0.20	5.0	0
Eggs, hen	158	13.0	11.5	0.5	1000	0.12	0.35	0.1	0

Source: B.S. Platt. Tables of Representative Values of Foods Commonly Used in Tropical Countries. Medical Research Corps Special Report 302, 1962. Cited in F.E. Devlo, C.E. Williams and L. Zoaka. Cowpeas: Home Preparation and Use in West Africa. International Development Research Centre, Ottawa, Canada, 1976.

Table D.3

Nutrient Content of Eight Cultivars of Cowpeas

Nutrient	Range	Average
Protein (g 100 g)	24.1 - 25.4	24.8 ± 0.48
Ether extract (g 100 g)	1.1 - 3.0	1.9 ± 0.62
Crude fibre (g 100 g)	5.0 - 6.9	6.3 ± 0.64
Ash (g 100 g)	3.4 - 3.9	3.6 ± 0.17
Carbohydrate (g 100 g)	60.8 - 66.4	63.6
Thiamin (mg 100 g)	0.41 - 0.99	0.74 ± 0.22
Riboflavin (mg 100 g)	0.29 - 0.76	0.42 ± 0.14
Niacin (mg 100 g)	2.15 - 3.23	2.81 ± 0.26

Source: R. Brissani, "Nutritive Value of Cowpeas". In Cowpea Research, Production and Utilization, edited by S.R. Singh and K.O. Rachie. John Wiley and Sons Ltd., 1985.

Table D.4

Essential Amino Acid Content of Cowpea (mg/g N)

Amino acid	Range in eight cultivars	Average
Arginine	433-572	500
Histidine	169-236	213
Isoleucine	305-333	318
Leucine	434-543	484
Lysine	467-497	486
Methionine	74- 82	79
Cystine	26- 38	32
Phenylalanine	251-290	263
Tyrosine	113-137	124
Threonine	242-281	251
Tryptophan	58- 82	68
Valine	252-368	314

Source: R. Brissani, "Nutritive Value of Cowpeas". In Cowpea Research, Production and Utilization, edited by S.R. Singh and K.O. Rachie. John Wiley and Sons Ltd., 1985.

Table D.5

Complementary Effect of Cowpea Protein to Maize and Sorghum

Diet (g)		Maize		Sorghum	
Cereal	Cowpea	Weight gain (g)	Protein equivalency ratio	Weight gain (g)	Protein efficiency ratio
90.0	0	54	1.22	21	0.97
71.9	6.1	—	—	33	1.43
67.5	7.6	78	1.59	—	—
63.0	9.1	—	—	40	1.48
53.9	12.2	—	—	42	1.51
45.0	15.0	102	1.84	43	1.55
36.0	18.2	—	—	33	1.40
27.0	21.3	104	1.82	—	—
18.0	24.3	—	—	34	1.27
0	30.0	78	1.41	25	1.13

Source: R. Brissani, "Nutritive Value of Cowpeas". In Cowpea Research, Production and Utilization, edited by S.R. Singh and K.O. Rachie. John Wiley and Sons Ltd., 1985.

Popular Dishes Made with Cowpeas and Their Major Ingredients

(Nigerian) Name	Ingredients
BOBO	(Boiled Cowpea with Gari*)
ROASTED CORN & COWPEA PORRIDGE	(with Shrimp)
RICE AND COWPEAS	
COWPEA & PLANTAIN POTTAGE	(with Smoked Fish)
DAN WAKE	(Cowpea Dumplings)
GBEGIRI	(Smoked Fish and Cowpea Soup with Tomatoes)
FREJON	(Cowpea and Coconut Custard)
COWPEA FLOUR SOUP	(with Smoked Fish and Tomatoes)
COWPEA SOUP WITH BEEF & OKRA	
COWPEA STEW WITH FRIED PLANTAIN	(with Smoked Fish, Shrimp and Tomatoes)
EWA-IBEJI	(Beans for Twins with Crayfish)
COWPEA WITH PUMPKIN	
COWPEAS WITH GUINEA CORN	(with Groundnut Paste)
EGWA HIKAJE	(Cowpeas with Pepper Sauce)
ADALU	(Cowpeas and Maize, with Smoked Fish or Crayfish)
EGWA IBALA	(Cowpeas with Corn Flour -- Gari may be substituted)
OBO EGWA	(Smoked Fish and Cowpea Soup)
EPEZA SOUP	(Cowpea Flour Soup with Spinach)
CHARODOKUN BLAU	(Sorrel and Cowpea Soup, with Smoked Fish and Daudawa**)
AMUJE	(Cowpea Soup with Smoked Fish)
AKARA, KOSAI, AKLA, etc.	(Fried Cowpea Balls)
AWON	(Fried Cowpea Balls with Okra)
KENGBE	(Largo Akara Fried in Palm Oil)
SEKE-SIN, KOOSE	(Fried Cowpea Cakes with Green Onions)
EKURU	(Steamed Cowpea Paste)
MOIN-MOIN, OLE-LE, TABANI	(Steamed Cakes, with Tomato, Fish or Crayfish)
JOGI	(Steamed Cakes with Toasted Melon Seed)
IKOKO	(Steamed Cakes with Smoked Fish or Shrimp)
APAPA	(Steamed Cakes with Bitter Pepper)
OWOWO	(Corn, Cowpeas and Groundnuts, with Coconut)
AYIBLI	(Cowpeas and Maize)
ROASTED COWPEAS	
ADAYI, LEKI, PAAF	(Cowpea Puree Baby Food)
APRAPRANSA	(Palmnut and Cowpea Puree, with Smoked Fish, Crawfish and Tom)
COWPEA KAKRO	(Fried Plantain and Cowpea Cakes)
COWPEA OFAM	(Baked Cowpea and Plantain Loaf)
PALM SOUP WITH COWPEAS	(with Beef, Fish, Shrimp, Tomatoes)
NKONTOMERE STEW WITH COWPEAS	(Smoked and Salted Fish, Tomatoes)
OKARA SOUP WITH COWPEA LEAVES	(with Meat, Fish, Shrimp)
COWPEA GARIFOTO	(with Gari, Eggs and Shrimp)
COWPEA STEW WITH EGG	
AYIKPLE WITH SHRIMP	(with Roasted Cornmeal, Shrimp, Tomatoes)
YAKAYAKE FROM COWPEAS	(Whipped Steamed Paste)

*GARI: Gelatinized Cassava; ** DAUDAWA: Locust Bean Cakes.

Source: Adapted from F.E. Davlo, C.E. Williams and L. Zoaka. Cowpeas: Home Preparation and Use in West Africa. International Research Center, Ottawa, Canada, 1976.

Table D.7

Nutritional Value of 100-Gram Servings of Selected Cowpea Dishes

	Kcalories	Protein calories (%)	NDpCal% ^a
Bobo	185	17.3	7.2
Roasted corn and cowpea porridge	251	10.8	5.3
Rice and cowpeas	254	9.6	5.0
Cowpea and plantain pottage	175	22.9	8.1
Dan wake	140	26.6	8.3
Gbegiri	131	29.9	8.2
Frejon	198	14.5	6.5
Cowpea flour soup	89	3.6	2.1
Cowpea stew with fried plantain	277	25.6	8.3
Akara (kosal, akla, or accara)	619	8	4.2
Cowpeas with Guinea corn	185	17.5	7.3
Cowpea cutlets	420	14.3	6.5
Moin-moin (ole-le, alele, or tabani)	193	19.1	7.6
Cowpea crepes	344	1.5	0.9
Eggs in cowpea blankets	403	20.8	7.9
Cowpea croquettes	367	12.4	5.9
Cowpea apiti	428	8.9	4.6
Cowpea sandwich spread	495	25.5	8.3
Cowpea cocktail tidbits	743	23.4	8.1
Cowpea tea cake	364	8.6	4.4
Cowpea pie	328	15.2	6.7
Ekuru	180	26	8.3
Cowpea ofam	219	5.8	3.2
Cowpea kakro	210	8.6	4.4
Aprapransa	218	20.2	7.8
Adayi (leki or paaf)	194	26	8.3

^aNDpCal% - Net Dietary Protein/Calories %. Calculated at the Food Research Institute, Accra, Ghana, 1975.

Source: F.E. Devlo, C.E. Williams and L. Zoaka. Cowpeas: Home Preparation and Use in West Africa. International Research Center, Ottawa, Canada, 1976.

APPENDIX E

Local Names for Cowpeas in West Africa

Country	Tribe	Local name
Cameroon	Bafo	Kon
	Balong	
	Bakossi	
	Bakwin	
	Bota	Kondi
	Mbonge	
	Bakundu	
	Balondo	
Batanga		
Benin	Djedji	Aiku vovo (small red)
		Aiku wéwé (small white)
		Aiku wagbé lafo (small red marbled with black)
		Doi ku (small black)
Gambia	Mandingo	Soso
Ghana	Twi	Adua
	Ewe	Ayi
	Bemoba	Too
	Mamprussi	Tipielega
	Ga and Krobo	Yo
	Dagomba and FraFra	Tuya
	Gurunshi	Saa
French Sudan (Mali, Upper Volta, Niger)	Bambara	Soso
	Songhai	Duri
Nigeria	Hausa	Wake
	Nupe	Ezo
	Fulani	Nyebbe
	Kanuri	Ngalo
	Gbari	Azzo
	Katab	Dijok
	Tivi	Alev, Arebe
	Shuwa arab	Lubia
	Bagarmi	Mongo
	Yoruba	Ewa
	Ibo	Akedi
	Efik	Akoti
Senegal	Wolof	Niebé
	Malinke	Niebé
	Serère	O-Gnaou
Sierra Leone	Yalunka	Seneni
Togo	Tschaudjo	Kedesche and Sona
	Basari	Kadje
	Kabure	Tombing
	Konkomba	Isanje

Source: Adapted from F.E. Devlo, C.E. Williams and L. Zoaka. Cowpeas: Home Preparation and Use in West Africa. International Research Center, Ottawa, Canada, 1976.

APPENDIX F
COMPARATIVE PEANUT AND COWPEA PRODUCTION IN NIGER

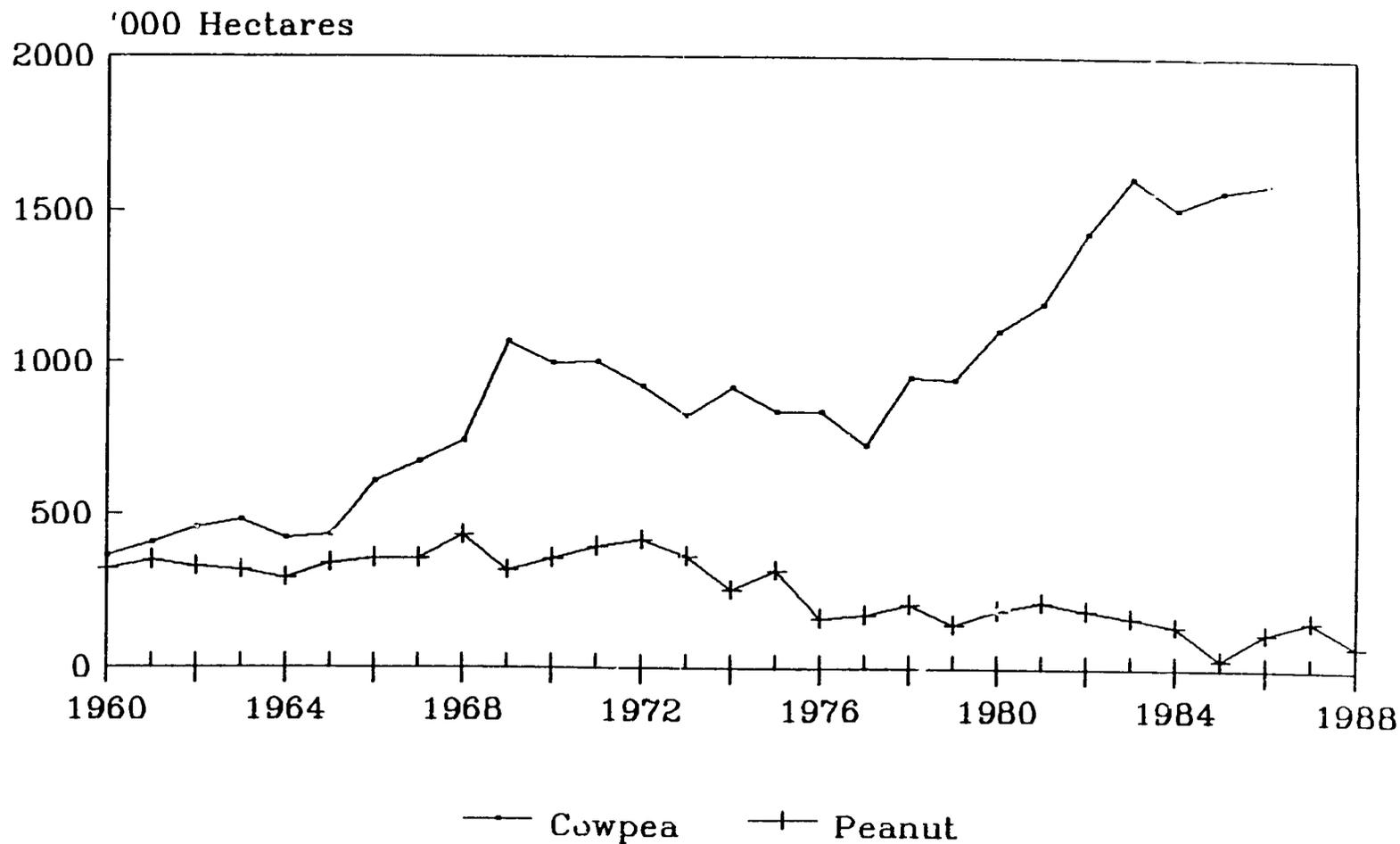
Summary Cowpea and Peanut Statistics for Niger, 1960-1988

Year	Cowpea Area	Cowpea Prod.	Cowpea Yield	Official Cowpea Exports	Estim. Cowpea Consump.	Total Cowpea Exports	Unoffic. Cowpea Exports	Peanut Area	Peanut Prod.	Peanut Yield
Units ->	'000 Ha	'000 MT	Kg/Ha	'000 MT	'000 MT	'000 MT	'000 MT	'000 Ha	'000 MT	Kg/Ha
1960	363.8	43.69	120							
1961	404.7	45.49	112					321.4	150.5	468
1962	454.0	57.35	126					348.9	151.8	435
1963	482.0	63.00	131					330.9	205.4	621
1964	423.1	59.45	141					318.5	220.3	692
1965	432.2	47.32	109					292.9	194.4	664
1966	605.0	67.60	112					341.4	276.5	810
1967	670.0	77.01	115					355.4	311.9	878
1968	738.5	78.76	107					356.7	298.3	836
1969	1068.0	99.68	93					432.0	252.4	584
1970	995.1	75.71	76					319.8	206.9	647
1971	999.6	91.24	91					357.5	204.6	572
1972	920.5	143.97	156					394.2	256.5	653
1973	822.8	102.00	124					418.0	260.7	622
1974	918.7	132.45	144					363.8	77.1	212
1975	839.3	218.50	260					256.0	129.1	504
1976	837.2	216.00	258	19	35	149	130	319.7	41.7	130
1977	726.3	206.83	285	49	33	143	94	164.2	79.2	482
1978	952.4	271.49	285	4	44	186	182	174.3	82.3	472
1979	944.7	303.78	322	19	49	209	190	210.2	96.8	461
1980	1105.1	268.76	243	49	43	183	134	344.9	88.5	611
1981	1197.6	281.62	235	4	44	190	186	189.6	126.1	665
1982	1427.9	281.74	197	4	44	187	183	218.4	96.0	440
1983	1608.5	271.35	169	15	44	186	171	190.4	77.5	407
1984	1512.8	194.84	129	12	32	134	122	167.6	75.0	447
1985	1566.2	115.33	74	0	19	79	79	142.7	30.3	212
1986	1590.5	292.94	184	31	47	202	171	29.8	8.5	285
1987		209.00		37	34	144	107	118.2	54.5	461
1988		343.00						158.9	40.2	253
								78.3	13.5	172

Sources : Various, including MOA reports and consulting studies (espec. Elliot Berg Associates).

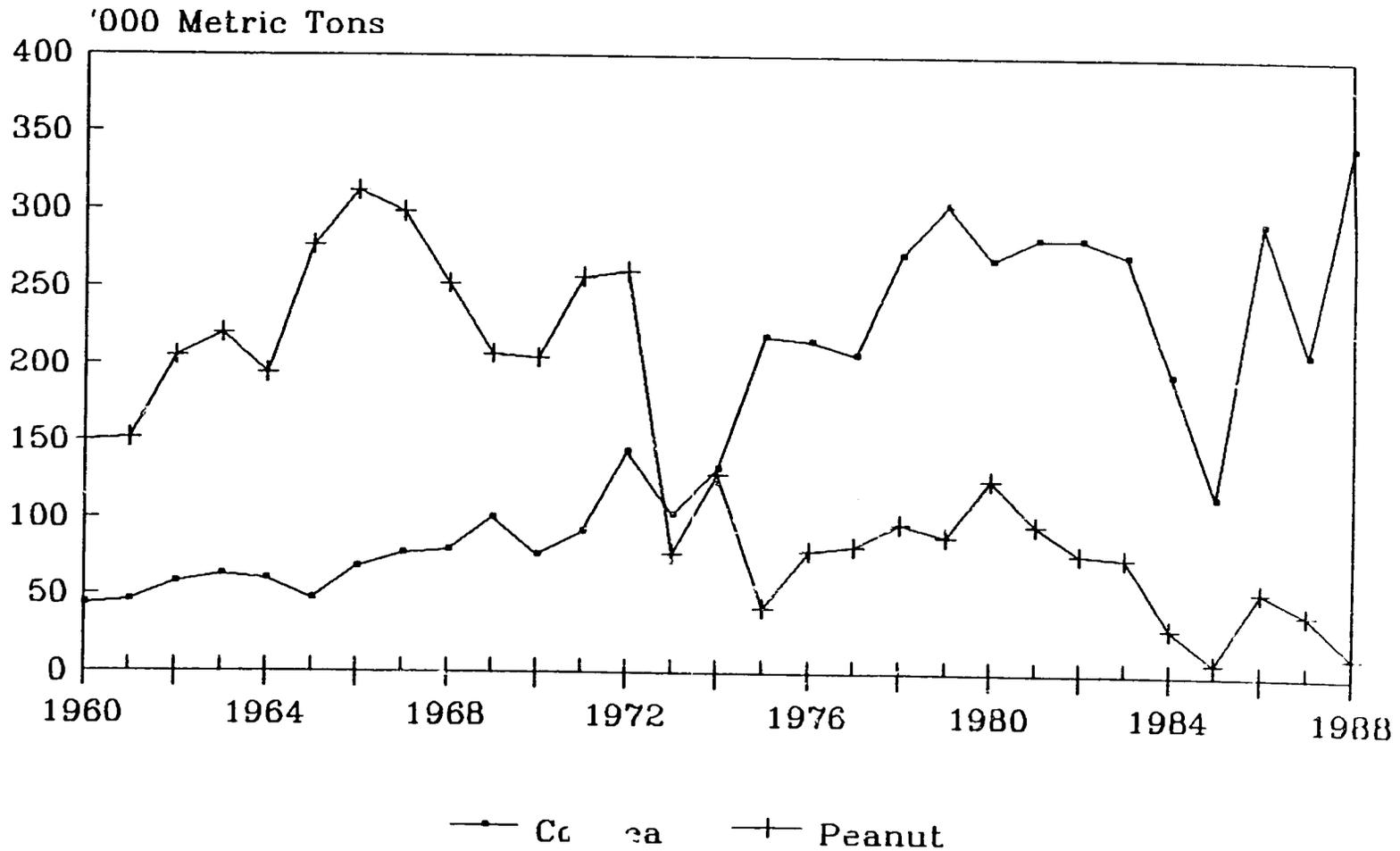
Note : Cowpea consumption and unofficial exports are estimated. See section 2.3.3

Cowpea and Peanut Area in Niger, 1960-1988



Source: MOA Annual Reports

Cowpea and Peanut Production in Niger, 1960-1988



Source : MOA Annual Reports

APPENDIX G

THE EXPORT TAX

This section focuses on the export tax and explores its effects on the Niger cowpea economy. A graphic representation is used to illustrate the effect of the tax on both official and unofficial trade.

Effects on Official Trade

The impact of the export tax on official trade in cowpeas is illustrated in Figure G-1. ES represents export or excess supply and ED represents export or foreign demand. Q^* and P^* are equilibrium quantities and prices in the absence of the tax.¹ Imposition of the export tax drives a wedge between producer and consumer prices, causing producer prices to fall to P_p and prices in the foreign market to increase to P_f . The difference between P_p and P_f is equal to the unit tax.

Positive Effects

Revenue generation: Government revenues are represented by area a+b. These revenues are equal to the per unit tax, T times Q_t , or the quantities exported after imposition of the tax.

Extracting rent from foreign consumers: Some of these revenues (area a) are extracted from foreign consumers. Area a is a function of export demand elasticity or the responsiveness of foreign consumers to the price increase resulting from the export tax.

Negative Effects

Reduced exports: Exports are reduced by an amount equal to $Q^* - Q_t$.

Fall in production: Not allowing for seeds and storage losses, production is equal to local consumption plus exports. A decrease in exports will be accompanied, ceteris paribus, by a decrease in production. Total loss to producers is equal to area b+c, of which area b is a contribution to government revenue from producers and area c is a deadweight loss generated by the reduction in export volumes.

1. This simplified representation assumes that the export tax is the only transaction cost separating supply and demand. Inclusion of other costs would not affect the final results.

Figure G-1

Effects of the Export Tax on Official Trade

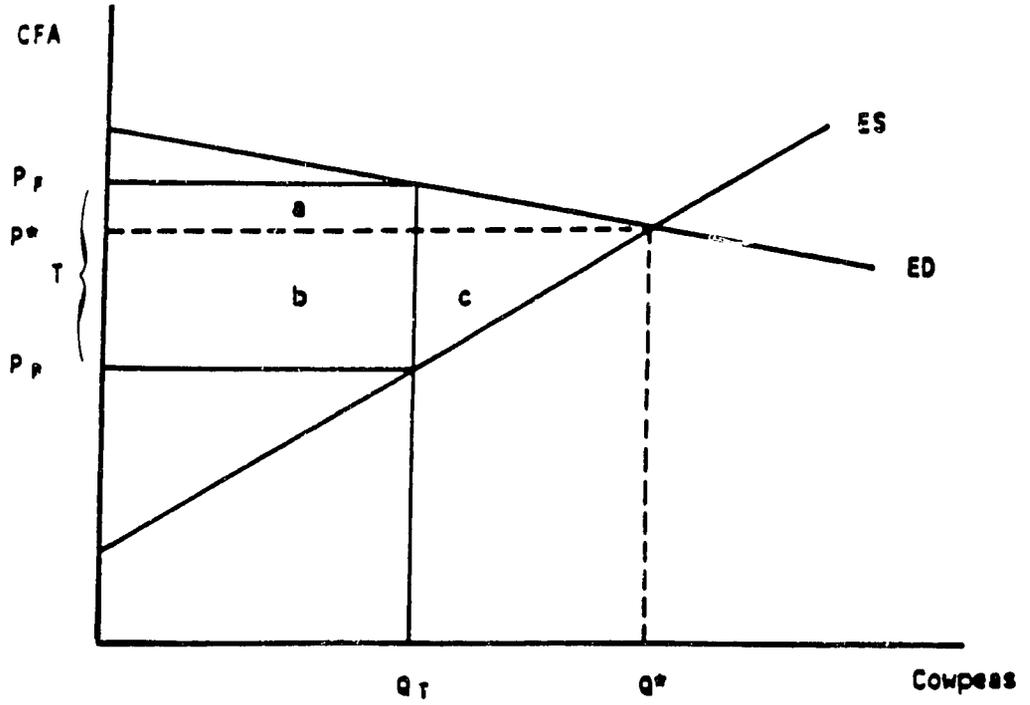
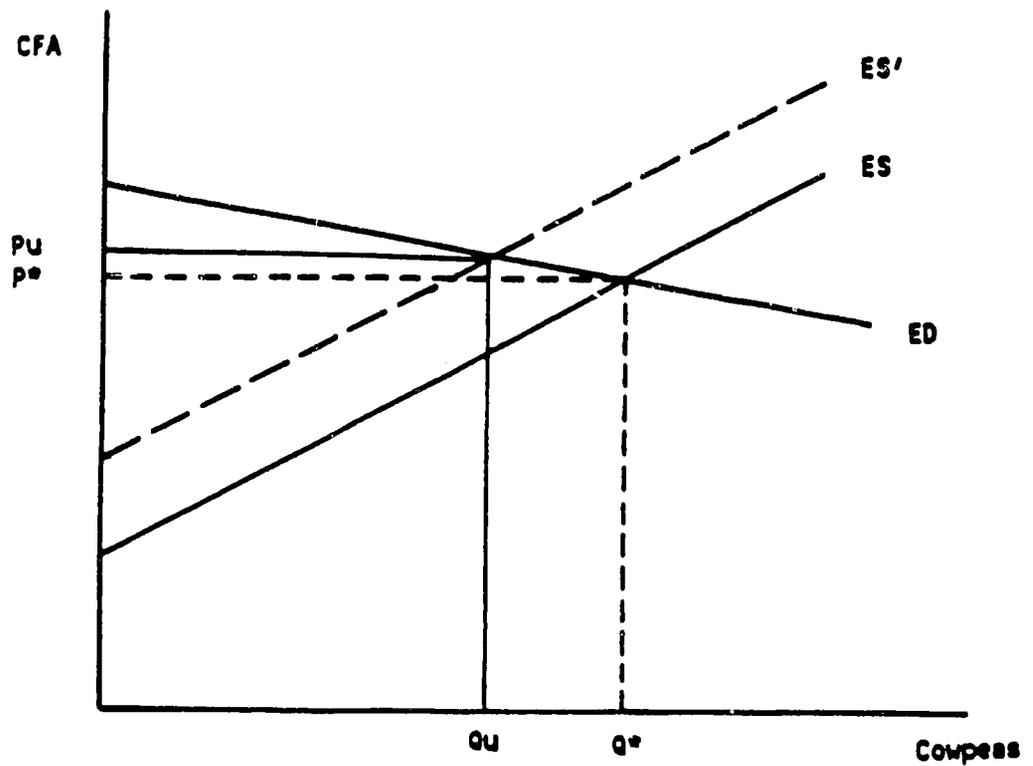


Figure G-2

Effects of the Export Tax on the Unofficial Cowpea Trade



Reduced income for traders: Even though losses incurred by traders are not shown in the diagram, they can be easily conceptualized as equal to the amount by which exports are reduced following the tax times the per unit net returns from cowpea exports.

Effects on Unofficial Trade

Analysis of the export market through unofficial channels has similar effects on exports, production and traders' income. These effects are illustrated in Figure G-2.

As in Figure G-1, ED and ES are export demand and export supply, respectively. The various costs and risks associated with illegal trade cause ES to shift upwards to ES'. This shift increases the price of Niger cowpeas in importing countries from P^* to P_U . The price increase reduces the export volume from Q^* to Q_U . The effects of decreased exports on producers and traders are similar to those described in Figure 5.

Benefits of the Export Tax

The tax on cowpea exports has two main objectives: extracting rent from foreign consumers, and raising revenue. These two objectives will be examined in turn.

Taxing foreign consumers: Foreign consumers generally share the burden of the export tax. Their share is determined by their responsiveness to changes in the price of the imported commodity. Available data did not allow estimation of price elasticity of demand for cowpeas in Nigeria, the major market for Niger exports. However, qualitative evidence suggests that this demand is price elastic. Based on this evidence, rents extracted from Nigeria consumers are most likely insignificant.

Raising revenue: Revenues generated by the tax are equal to the per unit tax times quantities exported. As indicated in Table G-1, revenues from cowpea exports averaged approximately 380 million cfa between 1982 and 1987. The export tax on cowpeas constitutes the main source (65 percent) of government revenue derived from agropastoral export taxes.

Costs of the Export Tax

The tax raises the cost of cowpea trade whether the product is exported legally or through unofficial channels. The contribution of the export tax to higher costs in the official trade is substantial. As explained above, the export tax paid can be as high as 53 percent of total marketing expenses.

Marketing costs incurred by unofficial traders are also higher with than without the tax. The differential reflects the cost of eluding the tax. In effect, trade willfully

unrecorded in customs records is often associated with illicit payments for false-invoicing services. Smuggling is subject to severe penalties including confiscation of merchandise. In addition, driving small quantities of cowpeas on trails to avoid detection is more expensive and more time-consuming than trucking the commodity over the border along paved roads.

Higher marketing costs raise Niger cowpea prices in foreign markets. Higher prices reduce competitiveness and therefore the volume of exports. The magnitude of this decline is most likely significant due to the probable price elasticity of Nigerian demand. This effect is even more significant in the long run; higher prices for Niger exports may stimulate cowpea production in Nigeria. In this way, increased foreign production could lead, over time, to further erosion of Niger exports.

The export tax may also be an obstacle to economies of scale in trade. As explained in Chapter II, unofficial traders move most cowpea exports. Trade through illegal channels is likely to reduce the scale of individual transactions and preclude more efficient export initiatives. Trading on larger quantities is also hindered by illegal traders' inability to use letters of credit with large Nigeria importers or open credit lines to finance illegal transactions.

The increased profit margin from large-scale operation would potentially lead to increased competition between traders and higher marketing efficiency. Improved marketing efficiency together with higher demand from rising exports would increase prices to farmers. A shift in relative prices could lead producers to allocate more of their resources to cowpea production, depending on available alternatives. Marginal lands would be put back into production, new lands would be developed (to the extent available) and more intensive and improved farming practices would be used.

The non-economic costs of the export tax are equally high. The case of cowpeas in Niger demonstrates that excess supply must spill over, legally if possible, illegally if necessary. This situation has created a harmful second-best alternative. By encouraging lawlessness and providing opportunity for corruption, the unofficial trade alternative may have caused heavy non-economic losses.

Table G-1

Tax Receipts from Cowpea Exports

Cowpea Exports ^a	19,000 tons
Tax rate	20 cfa/kg.
Tax receipts from cowpea exports	380 million cfa
Total tax receipts from agropastoral products ^b	583 million cfa
Cowpea taxes as % of tax on agropastoral products	65%
Total government tax revenues ^c	61,720 million cfa
Cowpea taxes as % of total tax revenue	0.6%

a. From Table 7

b. Average for 1982-1987. From Table 3 in Analysis of the Impact of Export Taxes on the Export of Agropastoral Products, Roger Poulin et al, Development Alternatives Inc., Feb. 1988.

c. Average government revenue, 1982-1987. Calculated from Poulin, op cit.

Conclusions

A strong rationale existed before October 1988 for removing the export tax on cowpeas in Niger. Revenue generated by the export tax was limited. Removal of the export tax will probably result in an increase in official exports and, consequently, more economic activity subject to direct taxation. Assuming the elimination or reduction of other administrative and fiscal procedures, this process could, in the long run, offset the revenue lost from elimination of the tax.

The export tax contributed, to a degree, to closing off the export market in Benin and has reduced the competitiveness of Niger exports to Nigeria. Removing the export tax has the potential to induce an expansion in cowpea exports in the short run. This expansion would be more significant in the longer run; removal of the tax would reverse the signal sent to Nigeria farmers to increase production, and increase Niger's current market share.

Elimination of the export tax accompanied by a reduction in the amount of fiscal and administrative procedures necessary to obtain export permits (i.e. to export in the formal market) could well encourage unofficial traders to conduct lower unit cost, larger-scale transactions. Economies of scale together with higher demand from rising export would stimulate local production and encourage adoption of better farming practices.

Equally important, elimination of the tax would remove the incentives to engage in illegal rent-seeking activities. Niger's long term development strategy has increasingly aimed at removing market imperfections and adopting policy reforms that promote exports in line with the country's comparative advantage. Elimination of the export tax would be one step towards achieving this goal.

APPENDIX H

Representative Costs and Returns of Exporting Niger Cowpeas to Nigeria

During informal interviews with wholesale traders in Niger and Nigeria, the R.A. team gathered cost and return data for use in constructing representative enterprise budgets for the exportation of Niger cowpeas. Since the sample of traders interviewed was small, the results are necessarily preliminary.

Four enterprise budgets are presented for Niger and Nigeria wholesalers. The first set of budgets (H-1 and H-2) shows representative costs and returns for Niger wholesalers shipping cowpeas from Zinder to Kano, a key Nigerian assembly/redistribution market in February 1988, when the export tax was being collected. Budgets with and without the export tax are presented. In the without export tax case, a 3% "statistical tax" is substituted. The third budget (H-3) illustrates costs and returns for Niger wholesalers shipping cowpeas from Zinder to Kano in December 1988, when the export tax was no longer being paid. Finally, the fourth budget (H-4) is for shipping cowpeas from Kano to Lagos, a key terminal market in southern Nigeria.

The assumptions used in constructing the budgets are as follows:

0. All costs and returns are reported in CFA. Costs and receipts in Naira were converted to CFA at the unofficial Naira/CFA exchange rate prevailing at the time indicated by each budget.
1. Costs are reported per 100 kilogram sack. Three hundred sacks make up a 30 ton truckload, a typical export shipment.
2. Transport costs include "cadeaux," i.e., gratuities or bribes necessary to pass control points.
3. The arrondissement tax is paid at the time and place of purchase in Niger. A local government tax is paid in Kano for shipment to southern markets in Nigeria.
4. The municipal tax is paid in Zinder when cowpeas are resold or exported.
5. "Other costs" include the cost of completely filling incompletely filled sacks, truck parking costs in Kano, and the cost of nightwatchmen. Wholesalers in Kano state that sacks of cowpeas

shipped from Niger are not completely filled, which requires that the traders have them filled before resale.

6. In the budgets which assume that Niger traders export cowpeas to Kano, no storage costs are included. It is assumed that Niger traders export cowpeas shortly after taking title to them in Niger, transferring the cowpeas quickly to Nigerian traders without incurring storage costs in Niger. Storage costs are included in the budget done for a Nigerian trader.
7. Financial charges or opportunity cost of capital calculations are not included in the budgets. Working capital invested in cowpeas is assumed to be tied up for short periods. Including financial or capital charges would lower net returns marginally.
8. The net returns are returns to labor, management and capital of the trader. To arrive at a net return to (working) capital invested in cowpeas, it would be necessary to estimate and net out a return to trader labor and management.

The enterprise budgets show first that net returns (26.1% of gross receipts) to exporting cowpeas were higher in February 1988 for those Niger traders who would have avoided paying the export tax (see Budget H-2). The 2,000 CFA export tax per sack was a heavy burden for those Niger exporters who paid the tax, as their net returns were 9.5% of gross receipts (see Budget H-1). The December 1988 budget (H-3) shows lower net returns to Niger exporters (7.3% of gross receipts) than those estimated for February 1988. This is probably best explained by the high degree of competition in both the Niger and Nigeria markets shortly after the cowpea harvest. Niger wholesalers/exporters report that net returns are generally higher during the February/March period of each marketing season than during the immediate post-harvest period (November-December). Further monitoring of trader costs and returns is needed to establish this claim empirically.

Net margins earned from shipping cowpeas from Kano to Lagos (see Budget H-4) are 11.2% of gross revenues per shipment. This margin is not unduly high but may decline with increased competition.

Budget H-1

Costs and Returns for 300 Sack Shipment of Cowpeas
from Zinder to Kano, Paying All Taxes
 (February 1988)

<u>Item</u>	<u>Unit Cost/Price</u> (cfa/100 kg. sack)	<u>Total Costs and Returns</u> (per shipment)
1. Purchase Price	6,000	1,800,000
2. Price of Sacks	400	120,000
3. Labor for handling and assembling	100	30,000
4. Commission to collection agent	250	75,000
5. Transport costs from village to Zinder	350	105,000
6. Arrondissement tax	50	15,000
7. Municipal tax	50	15,000
8. Export tax	2,000	600,000
9. Transportation Zinder-Kano	500	150,000
10. Other costs	250	75,000
Total costs	9,950	2,985,000
Revenues	11,000	3,300,000
Net returns	1,050	315,000
Net margin		9.5%
Export tax as % of marketing expenses (items 2-7; 9-10)		50.6%

Budget H-2

Costs and Returns for 300 Sack Shipment of Cowpeas
from Zinder to Kano, Not Paying the Export Tax
 (February 1988)

<u>Item</u>	<u>Unit Cost/Price</u> (cfa/100 kg. sack)	<u>Total Costs and Returns</u> (per shipment)
1. Purchase Price	6,000	1,800,000
2. Price of Sacks	400	120,000
3. Labor for handling and assembling	100	30,000
4. Commission to collection agent	250	75,000
5. Transport costs from village to Zinder	350	105,000
6. Arrondissement tax	50	15,000
7. Municipal tax	50	15,000
8. Statistical tax	180	54,000
9. Transportation Zinder-Kano	500	150,000
10. Other costs	250	75,000
Total costs	8,130	2,439,000
Revenues	11,000	3,300,000
Net returns	2,870	861,000
Net margin		26.1%

Budget H-3

Costs and Returns for 300 Sack Shipment of Cowpeas
from Zinder to Kano, Not Paying the Export Tax
 (December 1988)

<u>Item</u>	<u>Unit Cost/Price</u> (cfa/100 kg. sack)	<u>Total</u> <u>Costs and Returns</u> (per shipment)
1. Purchase Price	9,000	2,700,000
2. Price of Sacks	400	120,000
3. Labor for handling and assembling	100	30,000
4. Commission to collection agent	250	75,000
5. Transport costs from village to Zinder	350	105,000
6. Arrondissement tax	50	15,000
7. Municipal tax	50	15,000
8. Statistical tax	180	54,000
9. Transportation Zinder-Kano	500	150,000
10. Other costs	250	75,000
Total costs	11,130	3,339,000
Revenues	12,000	3,600,000
Net returns	870	261,000
Net margin		7.3%

Budget H-4

Costs and Returns for 300 Sack Shipment of Cowpeas
from Kano to Lagos
 (December 1988)

<u>Item</u>	<u>Unit Cost/Price</u> (cfa/100 kg. sack)	<u>Total</u> <u>Costs and Returns</u> (per shipment)
1. Purchase Price	12,000	3,600,000
2. Local Government Tax	50	15,000
3. Storage Costs	1,500	450,000
4. Labor for handling and assembling	200	60,000
5. Commission agent fee	100	30,000
6. Transport	600	180,000
7. Other costs ^a	200	60,000
Total costs	14,650	4,395,000
Revenues	16,500	4,950,000
Net returns	1,850	555,000
Net margin		11.2%

Note: Although prices and costs are expressed in CFA, this budget is prepared for a Nigeria trader who pays and is paid in naira. The exchange rate used for December 1988 was Naira = 25 CFA.

APPENDIX I

THE COWPEA MARKET IN BENIN

The terms of reference for the present study included an examination of the cowpea market in Benin as it was felt that this might constitute an important market for Niger cowpeas. As will be seen in the following sections, trade restrictions imposed by Benin have sharply restricted trade with Niger, and in any case there is limited demand for imported cowpeas.

Cowpea Production

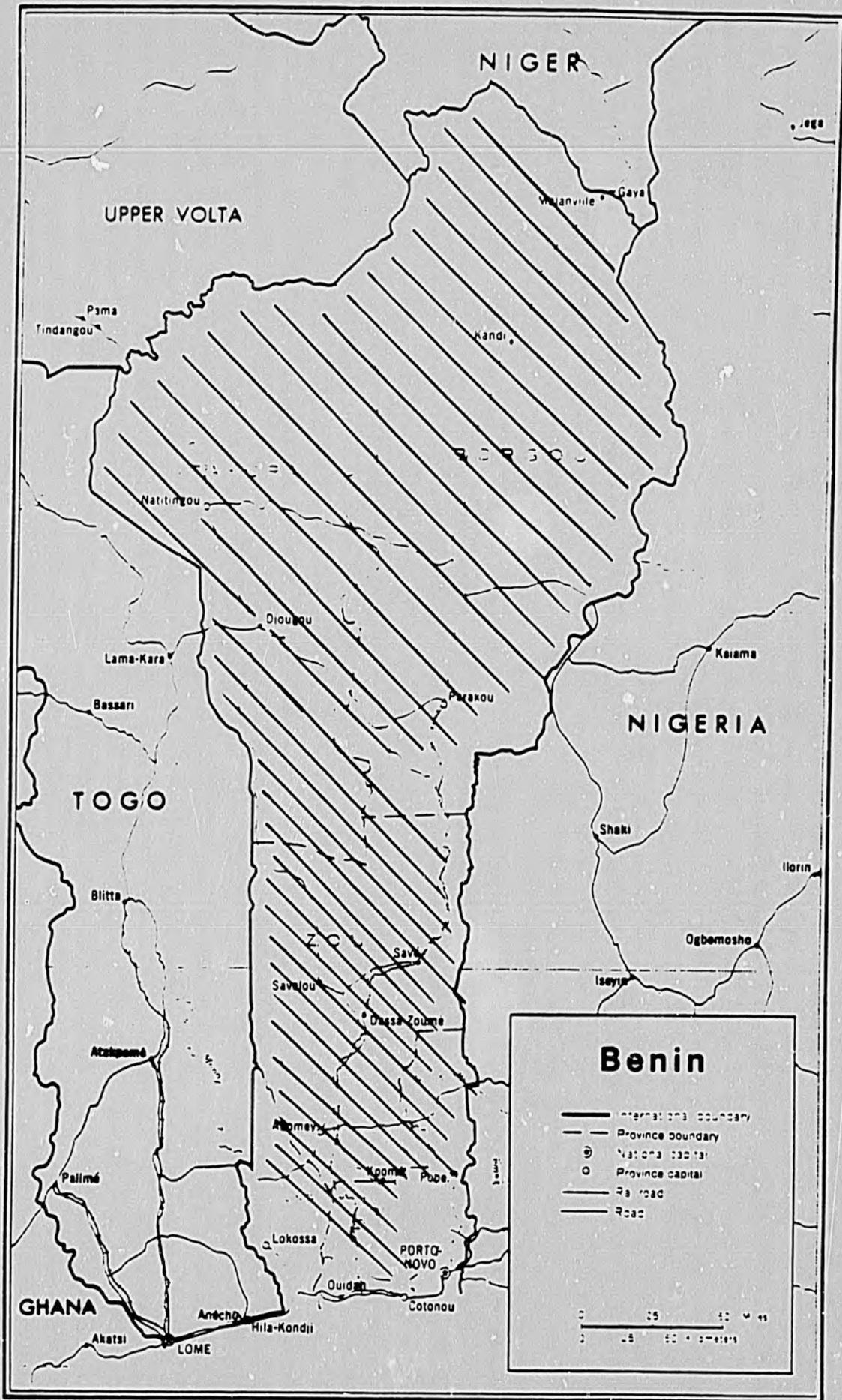
Major food crops produced in Benin are maize, cassava, yams and millet. Cowpea production was approximately 35,000 tons in 1987 and averaged 39,000 tons over the last four years. With the exception of 1987, when rainfall was below average in the northern regions, yields have increased from 400 to 500 kg/ha in recent years (Table 15).

Cowpeas are produced in the Borgou and Atacora Provinces (see map in Figure 8) once a year during the rainy season between May and October. As shown in Table 16, the southern provinces provide the bulk of cowpea production; farmers in these provinces produce two crops, one during the long rainy season between April and July and one during the shorter rainy season between October and November. Supplies are shortest in the April-May and August-October periods. The monthly retail price list presented in Table 17 reflects these supply conditions. During these periods, cowpea prices in Niger are approximately half those prevailing in Cotonou.

Cowpea, Consumption

Results of a consumption study conducted by the National Institute of Statistics and Economic Analysis were not yet available at the time of this rapid appraisal. Consumption patterns suggest, according to knowledgeable observers, that per capita cowpea consumption in Benin is much higher in urban than in rural areas. This is the reverse of the situation in Niger.

FIGURE 3. MAP SHOWING COWPEA PRODUCTION ZONES IN BENIN



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Table I-1

Cowpeas in Benin: Yield and Production

	<u>1980 - 1987</u>							
	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
Area (000 ha)	62	68	72	74	80	78	81	87
Yield (kg/ha)	458	409	404	387	530	501	499	401
Production (000 tons)	28.4	28	29	28.6	42.4	39	40	35

Source Data provided by the Institut national de la statistique et de l'analyse économique, Cotonou, Benin.

Table I-2

Cowpea Production in Benin by Region and Province1987

<u>Region or Province</u>	<u>Percentage of Total Production</u>
<u>North</u>	35.4
Borgou	21.0
Antacora	14.4
<u>South</u>	64.6
Zou	27.7
Mono	13.1
Atlantique	5.1
Oueme	18.7

Source: Data provided by the Institut national de la statistique et de l'analyse économique, Cotonou, Benin.

TABLE I-3

Cowpea^a Monthly Retail Prices in Cotonou

	<u>1986 - 1988</u>		
	<u>(cfa/kg)^b</u>		
	<u>1986</u>	<u>1987</u>	<u>1988</u>
January	257	184	237
February	250	198	237
March	224	237	237
April	263	258	253
May	263	263	263
June	NA	174	
July	NA	184	
August	274	219	
September	263	211	
October	263	211	
November	237	158	
December	211	145	

NA = Not available

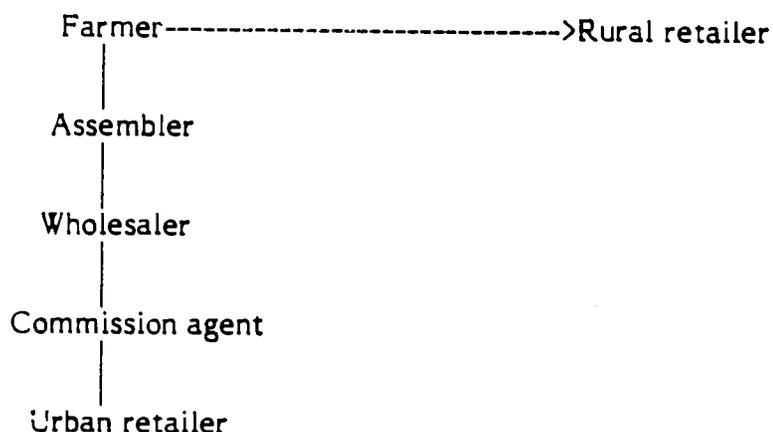
- a. These prices are for the "white" variety, the most prevalent in Niger markets.
- b. Prices shown have been converted to a per kilogram basis from the standard tohougola measure, which is equivalent to 0.95 kg.

Source: Direction de l'homologation des prix, Ministère du commerce, de l'artisanat et du tourisme, Cotonou, Benin.

There are three main cowpea varieties: red, black and white cowpeas. Urban demand is highest for the white variety. Not only is this variety tastier and less demanding in cooking time, but it is also used to make Ata, a highly popular local doughnut.

The Marketing System

The cowpea marketing chain is dominated by women traders. As shown in the diagram below, cowpea surpluses are channelled from rural areas to local urban centers by small-scale assemblers, then shipped to larger cities. These quantities are stored by large-scale wholesalers and sold to retailers, one to several bags at a time, through commission agents. In the retail markets, cowpeas are sold in tohoungolos or 0.95-kg units. Cotonou and Porto-Novo, with 37 and 15 percent respectively of the country's total urban population, represent the two major cowpea markets.



Effects of Government Interventions on Cowpea Trade

Due to food security concerns, exports of cowpeas from Benin were, prior to 1986, prohibited by law. A 14 percent export tax has been in effect since 1986. Exporters must, in addition, apply for an permit before each transaction and this application is in most cases rejected.

Imports amounted to 54, 62 and 322 tons in 1981, 1982 and 1983 respectively. These quantities were non-local, larger-bean varieties imported in small packages from France, England, Spain, Ivory Coast and the U.S. Although data for 1984-1987 are not available, there is no reason to believe that imports were substantially higher during these four years, particularly after 1986 when a prohibitive tax rate was applied to cowpea imports.

As indicated in Table I-4, there are three different taxes on cowpea imports: an import tax, a taxe á la consommation locale or local consumption tax, and a taxe d'expertise or "expertise" tax. Translated into percentage terms and using May 1988 prices in Niger as an example, these taxes amount to a rate of more than 63% of the purchase price, assuming the declared import price is 150 Cfa/kg. Not surprisingly, recorded imports of cowpeas from neighboring countries have been almost nonexistent in the last three years. Data provided by customs show that only 295 kg of cowpeas have been imported from these countries since January 1986. These quantities were imported from Nigeria (285 kg) and Togo (10 kg).

Table I-4

Taxes on Cowpea Imports in Benin

<u>Tax</u>	<u>Rate or Amount</u>
Import price	150 CFA/kg
Import tax	13% of Value
Local consumption tax	75 CFA/kg
Expertise tax	<u>50 CFA/ton</u>
Total	94 CFA/kg
as % of Purchase Price	63%

During three different visits to the Dan Tokpa wholesale market in Cotonou only six 100-kg bags of Nigerien cowpeas were found. Although the owner was not available for an interview, her commission agent revealed that these quantities had crossed the Niger-Benin border through unofficial channels to Malanville where they were shipped to Cotonou.

The absence of Niger cowpeas in Cotonou is not surprising. Tables I-5 and 6 demonstrate that cowpea trade between Niger and Benin, whether undertaken through official or unofficial channels, is not a rewarding enterprise. An examination of Table I-5 shows that exporters venturing into legal cowpea trade between Niamey and Cotonou would indeed incur heavy losses. These losses would amount to approximately 70,000 cfa per ton or more than 2 million cfa for a 30-ton truckload. Eliminating the export tax still makes cowpea exports to Benin unprofitable.

Table I-5

Costs and Returns for a 100-kg Sack Shipment of Cowpeas
from Niamey to Cotonou Through
Official Channels in Benin

	<u>Unit Cost</u> (cfa)	<u>Total Cost</u> (cfa)
<u>Costs</u>		
Purchase price		15,000
Loading		50
Transport	18,920 CFA/T	1,812
Export tax (Niger)	20 CFA/kg	2,000
Import tax (Benin)	13% of value	1,950
"Local consumption Tax" (Benin)	75 CFA/kg	7,500
"Expertise tax" (Benin)	50 CFA/ton	5
Unloading and loading at Railway Station		300
Transport from Railway Station to the Dan Tokpa Wholesale Market		60
Unloading		150
Total costs	28,835	
Sales Price		22,000
Net Returns (Losses)	(6,835)	
Export tax as % of marketing expenses	15%	

Source: Phase I field work, May 1988.

Unofficial or clandestine trade provides a second alternative to importers. However, traders who follow unofficial channels once they arrive with the commodity in Benin would only break even or make a very small profit (Table I-6). This outcome is a result of the various cadeaux or bribes that must be given to pass the numerous control points when import and other taxes are not paid. Note that the Niger export tax constraint is the controlling factor in the unofficial trade alternative. Removal of the tax would result in a net return of approximately 2,100 cfa per ton exported or ten percent of total costs. This profit margin is roughly equal to the export tax itself.

Table I-6

Costs and Returns for a 100-kg Sack Shipment of Cowpeas
from Niamey to Cotonou Through
Unofficial Channels in Benin

<u>Item</u>	<u>100 Kg Unit Cost (cfa)</u>	<u>% of Marketing Margin</u>	<u>100 Kg Sack Total (cfa)</u>
<u>Costs</u>			
Purchase Price			15,000
Loading			50
Transport	17,000/ton ^a	24.6	1,700
Export tax (Niger)	20/kg	29	2,000
Miscellaneous ^b		43.5	3,000
Unloading			150
Total Costs			21,900
<u>Returns</u>			
Sales price			22,000
Net returns			100
Net returns without the export tax			2,100
Export tax as % of marketing expenses			29%

- a. Fees charged by private transporters are lower than those charged by the Organisation commune du Benin et du Niger, OCBN (see Table I-5).
- b. Represents cadeaux or bribes to pass control points in Benin when import and other taxes are not paid.

Source: Phase I field work, May 1988.

It is important to point out that even under the assumption of free trade, the Benin cowpea market has limited potential for Niger exporters. Benin is a small country with less than 4 million inhabitants, a low GNP per capita (less than \$260 expressed in constant 1985 dollars) and a modest urban population (1.4 million in 1985). In addition, local cowpea production is relatively substantial and has been increasing.

The virtual absence of trade between Niger and Benin is explained by the high marketing costs illustrated above. Foremost among these costs are the prohibitive taxes imposed on cowpea imports. Nonetheless, some additional trade might occur if the Niger

export tax were removed. The fact that this tax has not generated any revenue at the Niger-Benin border for many years provides an additional argument for its removal.

APPENDIX J
INFORMAL QUESTIONNAIRES:
COWPEA TRADERS AND PRODUCERS

J.1: GUIDE D'ENTRETIEN: COMMERÇANTS

Date: _____

Village: _____

Région: _____

1. Nom du Commerçant: _____
2. Ethnie: _____
3. Catégorie de commerce (grossiste, exportateur, détaillant, collecteur, ou autres intermédiaires): _____
4. Depuis combien d'années êtes-vous dans le commerce du niébé? _____
5. Quels sont les autres produits dont vous traitez? _____

6. Quantités achetées pendant les deux dernières campagnes de commercialisation du niébé:
 - a. Quantités achetées en 1988

Quantité	Période	Prix (par Kg)	Lieu d'achat
1.			
2.			
3.			
4.			

-
- b. Quantités achetées en 1987

Quantité	Période	Prix (par Kg)	Lieu d'achat
1.			
2.			
3.			
4.			

-
-
- c. Comment déterminez-vous la quantité à acheter?
- d. Pourquoi avez-vous acheté plus (moins) de niébé en 1988?
7. Enumerez les frais d'achat (y compris transport, taxes, manutention, etc.): _____

8. Quantités vendues pendant les deux dernières campagnes de commercialisation de niébé:

a. Quantités vendues en 1988

Quantité	Mois	Prix (en Kg)	Lieu de vente	Acheteur (Nigerien ou Nigerian)
1.				
2.				
3.				
4.				
5.				
6.				

b. Quantités vendues en 1987

Quantité	Mois	Prix (en Kg)	Lieu de vente	Acheteur (Nigerien ou Nigerian)
1.				
2.				
3.				
4.				
5.				
6.				

9. Enumerez tous les frais de vente (y compris transport, taxes, manutention, etc.): _____

10. Enumerez, s'il y a lieu, les problèmes d'écoulement du niébé:

11. Indiquez le(s) mois pendant le(s) quel(s) il est facile d'écouler le niébé:

/ ____ /

12. Indiquez le(s) mois pendant le(s) quel(s) il est difficile d'écouler le niébé:

/ ____ /

13. Comment déterminez-vous votre prix d'achat?

/ ____ /

- a = en fonction du prix courant
- b = en fonction de la variété ou de la qualité
- c = en fonction du prix anticipé
- d = autres _____

14. Quelles variétés achetez-vous? Enumerez-les. (en français et en hausa).
Pourquoi? _____
Prix d'achat _____
15. Quelle est la variété la plus facile à écouler?:
Au Niger _____
Au Nigeria _____
16. Quelle est la variété la plus difficile à écouler?:
Au Niger _____
Au Nigeria _____
17. Comptez-vous augmenter la qualité de niébé que vous achetez? Si non,
pourquoi? _____

18. Connaissez vous d'autres marchés, au Niger ou au Nigeria, où vous pourriez vendre
du niébé?

- Si oui, fréquentez-vous ces marchés? _____
_____ oui
_____ non
- Si non, pourquoi pas? _____

19. Comment vous informez-vous sur les prix?
-- par l'intermédiaire d'autres commerçants
-- par téléphone
-- par radio
-- autres (preciser) _____
20. Quelles sont les contraintes majeures dan le marché du niébé?
_____ manque de débouchés
_____ prix pas assez élevés
_____ problème de transport
_____ taxe à l'exportation
_____ licence d'exportation
_____ environnement politique
_____ qualité du produit
_____ autres (precisez)

21. STOCKAGE

- a. Stockez vous du niébé?
- b. Si oui, pendant combien de temps? /_____/ semaines
/_____/ mois
- c. Si non, pourquoi? _____
- d. Comment décidez-vous entre stocker ou vendre tout de suite?

- e. Évaluez vos pertes de stockage: _____ %

22. EXPORTATION

- a. Exportez-vous du niébé au Nigeria? /_____/ oui
/_____/ non
- b. Si non,
1. Pourquoi? _____
2. Dans le temps avez-vous exporté du niébé? /_____/ oui
/_____/ non
3. Si oui, pourquoi avez-vous cessé de le faire?

- c. Quelles sont les conditions à remplir avant de pouvoir exporter?

- d. Si la taxe à l'exportation était éliminée, exporteriez-vous du niébé?
/_____/ oui
/_____/ non
Pourquoi? _____
- e. Pensez-vous que la patente décourage l'exportation formelle du niébé?
/_____/ oui
/_____/ non
Pourquoi? _____
- f. Estimez-vous que la SONARA doit continuer de jouer un rôle important dans le commerce de niébé? _____

- g. Quelles sont les contraintes à une augmentation de l'exportation du niébé?
Au Niger: _____
Au Nigeria: _____
- h. Enumerez les frais d'exportation (y compris transport, taxes, manutention, etc.). _____

14. Prix

Période	Prix de Vente
Vente #1	
Vente #2	
Vente #3	
Vente #4	
Vente #5	

15. Qu'est-ce que vous pensez des prix obtenus?
trop bas _____
suffisants _____
assez élevés _____
16. Si vous vendez tout votre niébé immédiatement après la récolte, pourquoi ne vendez-en vous pas une partie quand les prix sont plus intéressants?
besoins financiers _____
problèmes de stockage _____
autre (à expliquer) _____
17. Quel est le lieu de vente?
18. Quels sont les termes de vente?
comptant _____
crédit _____
troc _____
pour service rendu _____
autre _____
19. A votre avis, quel est la marché le plus important pour le niébé?
Pourquoi? _____
20. Comment vous informez-vous sur les prix? _____

21. Qu'est-ce que la culture de niébé vous a permis de réaliser? ("sous-entendu": que faites-vous des revenus de niébé)?

22. Vendez-vous les fanes de niébé? _____ oui
_____ non

Si oui, à qui? à quelle période? et à quel prix?

23. Avez-vous des problèmes d'écoulement du niébé? _____
Si oui, précisez-les:

_____ pas de débouchés

_____ difficulté de transport

_____ prix insuffisant

_____ autres (à préciser) _____

24. Voudriez-vous produire d'avantage du niébé? Pourquoi? _____

25. Avez-vous l'habitude de stocker le niébé? _____ oui
_____ non

Si oui, indiquer l'endroit et la période: _____

26. Quels sont les problèmes de stockage rencontrés? (insectes, pourriture, rats, autres animaux, vol, autres) _____

27. Évaluez-vous les coûts de stockage y compris les pertes: _____

TRANSPORT

28. Transportez-vous le niébé au marché vous même? _____ oui
_____ non

29. Pensez-vous que la SONARA (ou le gouvernement) peut aider les producteurs à écouler leurs produits? Comment? _____

APPENDIX K

LIST OF PERSONS CONTACTED

NIAMEY

M. Madou Mahamadou	Ministre du commerce, de l'industrie et de l'artisanat
M. Maliki Barhoumi	Directeur du commerce intérieur, Ministère du commerce
Mme. Gamatié Fati	Directrice du commerce extérieur, Ministère du commerce
M. Idrissa Seydou	Centre Nigérien du commerce extérieur, Chambre de commerce
M. Doldo	Directeur DEPSA, Ministère de l'agriculture
M. Philippe Singelos	DEPSA, Ministère de l'agriculture
Mme. Abdou Christiane	Inspectrice principale, Direction générale de la douane
M. Balla Goga	Directeur régional, Inspection régionale de la douane, Départements de Niamey et Dosso
M. Sourghia	Directeur général, SONARA
Dr. R. Bonny N'Tare	ICRISAT

USAID PERSONNEL AND CONTRACTORS

Mr. Michael Kerst	Special Projects Officer, GDO
Mr. Jim Goggin	Agricultural Economist, ADO
Dr. Frank Martin	Economist, USAID
M. Hararou Djibo	Program Assist., Program Office
Dr. Henri Josserand	Director, Agricultural Sector Development Grant, University of Michigan/CRED
Mr. C. Franklin Casey	University of Michigan/CRED
Mr. James Gray	University of Michigan/CRED
M. Papa Sene	Project Director, CLUSA
Dr. Mick O'Neill	Niamey Productivity Project (DAI)
Mr. John Mullenax	Project Director, ASP
Mr. John Lamers	Agronomist, ASP (IFDC)

MARADI DEPARTMENT

M. Ousseini Mahamane Rabiou	Secrétaire général, Préfecture (May 1988)
M. Malam Morounga Adambé	Secrétaire général, Préfecture (Dec. 1988)
M. Hamadé Adama	Directeur adjoint, Service de l'agriculture
M. Bechir Amadou	Chef du programme semencier, Service de l'agriculture
M. Hassan Garba	Chef de Service, Antenne Commerce à Maradi
M. Yazid Goro	Directeur régional de la SONARA
M. Ibrahim Garba	Directeur, URC
M. Chaibou Lawaly	Chef d'antenne à Maradi, Chambre de Commerce
M. Ibrahim Amadou	Agent/CLUSA, Dankeri
M. Francois Kofi	Directeur régional de la douane (May 1985)
M. Soumaila	Directeur régional de la douane (Dec. 1988)

ZINDER DEPARTMENT

M. Amadou Amidou Maiga	Secrétaire général, Préfecture
M. Bawa Gaoh Assoumane	Chef de service de la production agricole, Service de l'agriculture
M. Aboubacar H. Siddo	Chef de service départemental du commerce de l'industrie et de l'artisanat
Mme. Mamane Karimata	Directrice adjointe, Antenne de commerce à Zinder
M. Gani Rabiou	Chef d'antenne à Zinder, Chambre de commerce
El Hadji Ibra Galadimi	Président national de l'Union nationale des coopératives
Cowpea Wholesale Merchants	

NIGERIA

Sokoto

Mr. Yahaya Abdulkarim	Perm. Secretary, Sokoto State Min. of Agric.
Mr. Adamou Warra	Chief, Planning and Monitoring Office, Sokoto State, Ministry of Agriculture
Mr. Murtala O. Raji	Perm. Secretary, Sokoto State Min. of Commerce
El Hadji A.J. Bako	Chief Commercial Officer, Sokoto State Ministry of Commerce
Mr. Udi Abdulahi	Dept. Chief, Commercial Officer, Sokoto State Ministry of Commerce
Mr. Shehu Guiya	Cowpea wholesaler, Sokoto Market
El Hadji Gandi	Cowpea wholesaler
Mr. Aboubakar Owarayo	Local Government Council
Mr. Shehu Mohammed	Manager, A.A. Keri, Ltd.
El Hadji Abou Namatta	Cowpea wholesaler

Zaria

Dr. George Abalu	Chairman, Dept. of Agricultural Economics, Ahmadu Bello University
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Kaduna

Mr. Brooke C. Holmes	U.S. Consul General
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Kano

Mr. El Hadji Hima Amadou	Consul of the Government of Niger
Mr. Moussa Karfe	Commercial Agent, SONORA
Mr. Mohammed Muktar	Commissioner, Kano State Ministry of Agric.
Mr. Gambo Diggol	Chief Agricultural Officer
Mr. Laudu L. Sulaiman	Perm. Secretary, Sokoto State Min. of Commerce
Mr. Hamza Ahmed	Director, NAMCO Nigeria Ltd.
Mr. Abdoulahi Harouna	Chief, Export Promotion, Kano State Ministry of Commerce
El Hadji Sabo	Commission Agent, Dawano Market
Assist. to El Hadji Leko	Cowpea wholesaler, Dawano Market
Mr. Musa Okeni	Cowpea wholesaler, Dawano Market
El Hadji S.K. Adelabo	Commission Agent, Dawano Market

Lagos

Dr. Frank Masson	Economist, ILO, Lagos
Mr. Gerald Cashion	USAID Deputy Director
Mr. Henry D. Merrill	USAID Affairs Officer
Mr. Thomas Pomeroy	Agricultural Attache, U.S. Embassy
El Hadji E.A. Ben Ahmed	Personnel Assist., NAMCO Nigeria Ltd.

Ibadan

Dr. B.B. Singh	Grain Legume Breeder, International Institute of Tropical Agriculture, IITA
Mr. H.J.W. Mutsaers	Agronomist, IITA
Prof. Ibi Ajayi	Chairman, Dept. of Economics, Univ. of Ibadan
Dr. Carol E. Williams	Professor, Dept. of Food Technology, University of Ibadan

BENIN (COTONOU)

Embassy of Niger

Nigerien Ambassador to Benin

Mr. Ousmane Goumandakoye

Attaché administratif

USAID-Cotonou/U.S. Embassy

Ms. Pam Fabian

Ministère du commerce, de l'artisanat et du tourisme

Mr. Robert Akindé

Directeur du Commerce Extérieur

Mr. Agbémaor A. Claude

Directeur du Commerce Intérieur

Mme. Leontine Mensah

Direction de l'homologation des prix

Ministère du plan et de la statistique

Mr. Emmanuel Amoussou

Directeur général de l'institut national de la statistique et de l'analyse économique (INSAE)

Mr. Pierre Babalola

Directeur des statistiques générales à l'INSAE

Ministère du développement rural et de l'action coopérative

Mr. Anatoel Cakpo Sogbohossou

Directeur de la recherche et de la statistique

Direction des douanes

Mr. Dominique Hounninou

Directeur adjoint

Mr. Kiki guilandri

Directeur de la comptabilité et de la statistique

Chambre de commerce et d'industrie

Mr. Agossa Deffodji Polycarpe

Secrétaire général

Mr. Acapoci Jean Apiti

Assistance technique

Mr. HOUNGBEDJI Protas

Office commercial, Centre Béninois du Commerce Extérieur

Mr. D'Almeida Ayi

Directeur

Organisation commune Bénin/Niger des chemins de fer et des transports

Mr. Da-Silva L.S. Martin

Directeur de l'exploitation et du trafic direct

Groupe des sociétés commerciales agro-industrielles, SOGAGRIKO

Mr. Yacouba Adam Fassassi

Directeur général

Société Catraille et Fils, Import-Export

Mr. Michel Megnissou Catraille Président directeur général

Société Achabi Trading Company, Import-Export

Mr. Chabi Kao Pascal Président directeur général

Société Bolarossa, Import-Export

Mr. Samuel Dossou Directeur général

Various traders in the Dan Tokpa wholesale market in Cotonou.