

— PN - REQ - 100
1/10/92

NIGER
EXPORT MARKETING OF
NIGERIEN ONIONS
EXECUTIVE SUMMARY

DECEMBER 1992

AGRICULTURAL MARKETING IMPROVEMENT STRATEGIES PROJECT

Sponsored by the

U.S. Agency for International Development

Assisting AID Missions and Developing Country Governments
to Improve Agricultural Marketing Systems

Prime Contractor: Abt Associates Inc.

Subcontractors: Postharvest Institute for Perishables, University of Idaho,
Deloitte Haskins & Sells,

PN-ABC-183

NIGER
EXPORT MARKETING OF NIGERIEN ONIONS
EXECUTIVE SUMMARY
FINAL DRAFT

Submitted to:

U.S. Agency for International Development
Niamey, Niger

By:

The Agricultural Marketing Improvement
Strategies Project (AMIS)

Dr. Eric J. Arnould, Postharvest Institute for Perishables
M. Iddal Sidi Mohamed, USAID/ANP-Niger

December 1992

Table of Contents

Page

GLOSSARY	ii
Introduction	1
Assessing Domestic Production	1
Assessing Exports and Export Potential	2
Policies and Investments Related to Onion Marketing	3
Policy and Regulatory Reform	3
Infrastructure Investment	4
Technology Investment	5
Human Capital Investment	5
Conditions that Contribute to Onion Marketing Efficiency	6
Price/Cost Distortion	6
Physical Market Infrastructure	6
Financial and Information Services	6
Market Participants	7
Public Sector Participation	9
Onion Marketing Efficiency and Cost	9
Prospects for Onion Marketing Based on Existing Cost and Efficiency Levels	10
Producer Price Incentives	10
Consumer Price Incentives	10
Agribusiness Investment and Gross Returns	11
Conclusions	12
Problems Encountered in the Marketing Channel and Possible Donor Interventions	13
Table 1 Onion Production in Niger	20
Table 2 Onion Exports Through Galmi Customs, Niger	21
Table 3 Comparison of Onion Production Costs	23
References	24

GLOSSARY

BIAO	Banque International de l'Afrique de l'Ouest
BIT/ILO	Bureau International de Travail/International Labor Office
CCCE	La Caisse Centrale de Coopération Economique, the French bi-lateral financial assistance agency
CEAO	Communauté Economique de l'Afrique de l'Ouest; see ECOWAS
CIF	Costs-Insurance-Freight price is FOB price plus additional costs of delivery to point of sale
CFA	Central African Franc, 250 CFA = U.S. \$1.00
CLUSA	Cooperative League of the U.S.A.
ECOWAS	Economic Community of West African States; see CEAO
FFW	Food for Work
FOB	Free-On-Board price is price of goods delivered to freight forwarding service or transporter
GIE	Groupement d'Intérêt Economique
GON	Government of Niger
INRAN	Institut de Recherche Agricole Nigerien
LWR	Lutheran World Relief
MAE/C	Ministère des Affaires Etrangères et de la Coopération
MAG/EL	Ministère de l'Agriculture et de l'Elevage
MP/F	Ministère du Plan et des Finances
MOC	Ministry of Commerce
ONAHA	Office Nationale des Aménagements Hydro-Agricoles
PBVT	Projet de la Basse Vallée du Tarka, Madaoua
PIK	Projet Intégré du Développement de l'Arrondissement de Keita
SNT	Syndicat Nigerien des Transporteurs
SONARA	Société Nigerienne de l'Arachide
UCOBAM	Union des Cooperatives Burkinabé
USAID	United States Agency for International Development
WOCCU	World Council of Credit Unions

EXPORT MARKETING OF NIGERIEN ONIONS

Introduction

Onions are an important crop in Niger. They are one of the few high value crops produced in the country. Onions enjoy a competitive advantage in regional markets, where the Violet de Galmi variety is known for its spicy taste and cooking properties. Farmers, traders, and truckers enjoy a reliable cash income stream from onion sales. Further, the GON derives considerable tax revenue (25 million CFA in 1992) from onion exports to neighboring countries. In the current climate of economic and political liberalization, onion production and trade is important because it has developed in the private sector. Thus, production and trade are relatively free from the distorting effects of public sector marketing board interventions that have plagued the development of other cash crops (e.g., groundnuts, cotton, palm products) throughout Niger and West Africa as a whole. Both GON and Niger's bi- and multi-lateral partners are anxious to learn from the successes of onion marketing in order to better develop and diversify Niger's agricultural economy.

This report summarizes results and conclusions of a study undertaken in July - August 1992 under the auspices of USAID/Abt Associates' Agricultural Marketing Improvement Strategies (AMIS) project. The objective of this study was to explore the nature of onion marketing more fully and to estimate the potential for marketing Nigerien onions in Niger and across West Africa over the next six years. The study focused on the details of the marketing channel dynamics by which Nigerien onions are produced and marketed in the sub-region. It was based on official statistics and interview data collected from many significant onion production and marketing channel participants in Niger as well as in Benin, Burkina Faso, Côte d'Ivoire, Ghana, and Togo.

The following report is divided into six major sections, each of which summarizes study results related to different aspects of the onion production/marketing system:

- Assessing Domestic Production
- Assessing Exports and Export Potential
- Policies and Investments Related to Onion Marketing
- Conditions that Contribute to Onion Marketing Efficiency
- Onion Marketing Efficiency
- Prospects for Onion Marketing Based on Existing Cost and Efficiency Levels

Following these sections are conclusions and recommendations for possible USAID/Niger interventions to address identified constraints to Nigerien onion production and marketing.

Assessing Domestic Production

Annual onion production estimates for Niger are found in Table 1. Production has doubled since 1980 to around 200,000 tons. Regional onion production data collected for each of the departments of the country shows that Tahoua department continues to produce most of the nation's onions. Tonnage produced is strongly related to area cultivated, and secondarily, yield. This indicates that neither innovative technologies nor costly inputs are broadly applied to onion farming. There is

very little hard data to be had on the topic of agricultural inputs. Many producers report shortages of reliable seed, fertilizers, and pesticides. Low-cost pumps are obtained easily in Nigeria.

The limited availability of cost-efficient water lifting technology, poor rural roads, and a shortage of agricultural credit are probably the major factors accounting for the gap between area currently cultivated in onions and potential area (29,000 ha). Large numbers of producers rent onion-producing land, but there is no absolute land shortage. The Projet de la Basse Vallée du Tarka (PBVT) predicts that extension of improved water lifting technology will double the area cultivated in Madagua and the southernmost part of Bouza arrondissements alone to about 1200 ha by 1998.

Assessing Exports and Export Potential

Data on Nigerian onion exports were brought up to date based on government export and import data. Table 2 shows quantities of onions declared for export at the Galmi customs post in Tahoua department. Exports reached a peak in 1990; shipments in 1992 were well below these levels.

Data were collected to better differentiate quantities of onions traded to Togo and Benin from those traded to Côte d'Ivoire, Burkina Faso and Ghana. According to data collected in Gaya, Niger on the Benin border, it is estimated that between 9 and 16 percent of total exports are destined for Togo and Benin. In 1991, 19,000 tons or a 70 percent market share were exported to Côte d'Ivoire; about the same amount was exported to Nigeria. In 1990, 1,700 tons were exported to Togo, or a 39 percent market share; a smaller amount is exported to Benin. In 1989, Burkina imported over 800 tons. Data from Ghana were gathered from informal sector sources and suggest that Ghana imports 3,000 to 5,000 tons annually. Due to data collection and processing weaknesses in many countries these data must be interpreted with considerable caution.

Nigerien data shows continued growth in exports. As shown in Table 2, exports grew 11 percent from 1987 to 1992. Data from other countries provides some information useful for assessing competition and market potential for Nigerian onions over time. It is safe to say that imports have increased in Côte d'Ivoire, Togo, Benin, and Ghana, but the quality of official import data is too poor to estimate the amount of increase. Nonetheless, competition is increasing from onions produced in Burkina, Ghana, and Nigeria, the latter two countries benefitting from the overvaluation of the CFA against their currencies. European onions are a strong competitor in the Ivoirian market.

Onion production in the savannah regions of Benin, Burkina and Ghana is increasing. For example, Burkinabé production was 10,000 tons in 1990, of which perhaps a tenth was exported. Beninois production was on the order of 3,960 tons in 1991; Togolese production was 2,000 tons in 1988. Togolese marketing channel participants argue that no onions are exported. Total Ghanaian production is on the order of 20,000 tons. Ivoirian production is only 2,000 tons annually.

Seasonal windows of opportunity in coastal markets favor Nigerian onions. The December-January dry season onion harvest in Tahoua department follows the November-December onion harvest in the savannah producing regions. The June-September rainy season harvest occurs at a time when price are extremely high on the coast and when conditions are unfavorable for savannah zone production and storage. Nigerian onions also maintain a fragile consumer preference advantage.

The weak development of international transportation and communications infrastructure such as telephone, telex and telefax links in the producing zone is a constraint to export marketing. Many marketers use such services when available.

Policies and Investments Related to Onion Marketing

Policy and Regulatory Reform

Due to a number of recent policy reforms, Niger's formal policy climate is conducive to an expansion of onion production and export. Unfortunately, informal policies, especially rent-seeking behaviors by government agents, constitute a constraint to the expansion of production and marketing. Onion traders have no incentive to pay commercial taxes and licensing fees since having ones dossier in order provides no protection from rent-seeking by agents of the state.

Niger is ill-equipped to keep its citizens abroad abreast of commercial developments at home. Niger's Embassy in Côte d'Ivoire has a limited staff that can barely serve the social service needs of Nigeriens living on Ivoirian territory. In Ghana, there is a lack of communication between the ambassador and the Nigerien commercial community in Accra. New commercial regulations are not available in languages other than French. GON commercial policies are not widely disseminated and not in languages other than French. This is a constraint to traders of perishable commodities such as onions who are not primarily French speakers. In Ghana, Togo and Burkina, some marketers either speak an international language or have access to someone with basic international language skills.

The overvaluation of the CFA against the Naira and the Cedi puts Nigerien onions at a disadvantage compared to Ghanaian and Nigerian onions, respectively. Nigerian onions are marketed in Benin and provide significant competition to Nigerien onions. On the positive side, the weakness of the English-speaking countries' currencies provides interesting savings in transport costs for Nigerien onion marketers using Ghanaian or Nigerian trucks. On the other hand, use of Ghanaian trucks by Nigerien traders has provoked conflict with the Syndicat Nigerien des Transporteurs (SNT) in Niger.

Official import regulations are relatively homogeneous among the ECOWAS/CEAO countries. In recent years, most countries have undertaken some actions to simplify the import process and reduce import duties to between 5-15 percent of their official value. But there is no formal sector support for import of perishables. One of the most serious barriers to importing Niger's onions and other perishable commodities is posed by conflict between marketers and the various policing bodies (customs, gendarmes, police) and marketers and transporters in the consuming countries. Illicit rent-seeking activities not only add to the CIF price, but create confusion and uncertainty and increase marketers' risks. Rent-seeking in the importing countries limits the extension of marketing channels to the secondary cities and rural areas that are currently underserved.

Most countries have undertaken some actions to facilitate the conduct of business. However, in many cases bureaucrats have little understanding or sympathy for what free market enterprise actually means. The official policy climate is complicated by the fact that overlapping regulatory structures are each pressured by salary compression, budget constraints, and falling state revenues. Each structure acts to maintain a grip on limited private sector resources. The result is that

regulations and necessary steps to start a new business or even maintain an existing one are confusing and contradictory.

Infrastructure Investment

Three kinds of infrastructural barriers to improved production and marketing exist in Niger: the road network; telecommunications; and storage.

The construction of rural feeder roads in the Tarka Valley should revolutionize both production and marketing patterns in Tahoua department. More improved rural roads would benefit both producers and marketers, lowering transport costs for producers and opening up new market centers for foreign marketers. Competition between these centers should transfer some economic benefits from intermediaries to farmers. Further investments in rural roads in the southern part of Tahoua department would be beneficial. Bad roads across international borders and in the northern border regions of Togo and Ghana also limit the development of onion exports.

Transport costs are high but stable, and do not prohibit marketing channel participants from making a profit. Traders maintain that transport is easy to arrange. Onion transport in open, metal sided tractor trailer trucks contributes to losses, especially if customs officials oblige truckers to off-load onions en route. New innovations in transport technology should be encouraged, but air shipment is probably not cost-effective.

Increased access to modern telecommunications is needed. Links between producing and consuming zones are weak. While major marketers in the major cities have access to some phone communications, it is erratic. This contributes to disorder in the marketing channel, and increases marketers' risks of losing money. Marketers in Côte d'Ivoire and Lomé, Togo do make use of the phone system, as do producers in Tamaske and the Galmi areas of Niger. Some informal sector marketers are still unaware of the benefits that might result from improved phone, telefax, and telex services. Others would be pleased to have improvements in this area. Improved telecommunications would be more effective than broadcast prices in improving the flow of market information.

Market intermediaries in the wholesale shipment assembly markets have invested in adobe "shipping docks", little more than traditional adobe houses costing on the order of 150,000 CFA each.

Opportunities for investment in improved appropriate technology on-farm storage exist in Niger. Financing both storage costs and improved infrastructure would provide handsome returns to producers and shipment assembly agents in the producing region. According to BIT/ILO figures, net margins per ton stored over a four to six month period increase from 55,433 CFA for a 2.5 ton capacity traditional rudu to 80,043 CFA for a 12-ton capacity improved adobe storage unit. Both the Projet Intégré du Keita (PIK) and the Projet de la Basse Vallée du Tarka (PBVT) have successfully experimented with promoting deferred onions sales. The method that has worked best is to advance onion producers money both to build improved individual storage facilities (rudu) and to withhold onions from the market. Storage facilities are typically built at the shipment assembly markets and major producing villages. These facilities both improve storage and support producer prices. Further investments in these activities could benefit several thousand producers over the next few years.

In the consuming countries, storage costs to wholesale importers are nominal. The reason for these low storage costs is that wholesalers are quick to place their inventories with small wholesalers and retailers. This spreads the costs of storage among participants in the marketing channel. Thus there is little incentive to invest in storage infrastructure in the consuming countries.

Technology Investment

There is virtually no formal sector financial support available to make investments in technology associated with Nigerien onion production and marketing. One exception is PBVT, which has provided over 70 million CFA in credit to 350 producers in the Tarka Valley in the form of pump sets and tube wells.

The traditional thatch storage facility or rudu provides effective storage for several months but inconvenient access to stock for monitoring. Minor improvements in the rudu along with regular monitoring of stocks can dramatically improve storage performance. BIT/ILO has perfected an appropriate technology-based, improved adobe storage facility. There is room in the marketing system for new marketing channel participants to concentrate on storage.

Almost no onions produced in the sub-region undergo any form of processing besides artisanal drying of bulbs and leaves (kullen albasa). Traders recognize the virtue of plastic net sacks for superior conservation of onions in the more humid coastal countries. One Ghanaian firm produces these sacks, but traders prefer European sacks that are of superior strength. One formal sector retailer in Ouagadougou has experimented successfully with selling various weights of sorted onions in plastic net bags.

All retailers sort and grade onions by size and quality. Wholesale and retail marketers recognize institutional customers' preference for larger bulbs and individual housekeepers' preference for smaller bulbs. The major reason for the latter preference has to do with price; smaller bulbs are less expensive. Sorting and grading probably should remain a retail function for the near term given the risk of further product damage/loss during shipment. It is preferable to lose some part of every shipment than to lose an entire shipment of some particular grade of onions.

Human Capital Investment

Few of even the largest informal sector onion marketers have received any technical, financial, or functional literacy training. Perhaps five percent of retailers are fluent in an international language. Some larger marketers have children or assistants who are literate and numerate in international languages and provide accounting or communications functions.

In Tahoua department, PBVT, PIK and CLUSA have invested in cooperative accounting training. Given the poor results of cooperative training achieved through the regional agricultural productivity projects in the 1970s and early 1980s, the effectiveness of this training should not be overestimated. While basic literacy and numeracy training has been conducted in many onion-producing villages, few cooperatives have substantial capital to manage with the skills they have acquired. Overall, the emergence of modern, free markets in Niger will be impeded without training in modern marketing and languages for cadre at the Ministries of Commerce and Foreign Affairs, students at the University of Niamey and informal sector operators.

Conditions that Contribute to Onion Marketing Efficiency

Price/Cost Distortion

Nowhere in the marketing channel is it possible to detect exaggerated profit-taking. Perhaps shipment assembly agents in Tahoua, who serve as intermediaries between producers and wholesale exporters, procure higher than average profits. However these agents provide important shipping, storage, negotiation, financing and facilitating functions to producers and exporters.

Government policies in most countries are moving toward simplified, stream-lined and lower cost procedures in commerce generally and for gaining entry to the onion trade. Nonetheless, regulations are unstable, and conflicting rules persist. Most market participants often confuse formal regulations with informal arrangements.

All onion production and marketing channel participants, as well as the national treasuries of the nations concerned by the onion trade, suffer from the effects of rent-seeking by agents of the state. Consumers face higher prices than they would if rent-seeking were not practiced. Rent-seeking discourages marketers from undertaking investments in extending distribution channels to consumers who are currently ill-served. Further, it discourages them from undertaking investments in improved storage and processing that would call attention to their apparent wealth, and from regularizing their status with tax authorities. Rent-seeking helps to suppress prices marketers are willing to pay to producers. It may even discourage producers from undertaking major investments that might attract too much attention. Rent-seeking and other informal arrangements between agents of the state and marketers rob national treasuries of large amounts of revenue. These sums could total fifty percent of legitimate fees and revenues.

Physical Market Infrastructure

Market intermediaries in the wholesale shipment assembly markets have invested in adobe "shipping docks", little more than traditional adobe houses costing on the order of 150,000 CFA each.

Very little storage is undertaken anywhere in the marketing channel. Storage costs are low, less than five percent of the CIF price. Storage in the marketplace is discouraged by the disinclination of most traders to tie up capital in a perishable commodity such as onions. Traders warn against trying to store onions in anticipation of price rises. Most storage takes place on the farm or at the shipment assembly point. Given the high cost of cold storage facilities, and the low value of the crop, investments in cold storage probably are not warranted.

Opportunities for investment in improved appropriate technology on-farm storage exist in Niger. Financing both storage costs and improved infrastructure would provide handsome returns to producers and shipment assembly agents in the producing region.

Financial and Information Services

In Niger, formal private sector actors are few and banks such as BIAO are unable or unwilling to finance onion production and marketing. As a result, producers and marketers self-finance many of their activities. Incentives for investment in onion production and marketing consist primarily

of high levels of export-led demand for Nigerien onions, and newly available, financially-attractive water lifting technologies.

Limited extension and financial services are available to producers and bulk wholesalers outside of the informal sector. In Tahoua department, donor-financed programs and projects provide the bulk of agricultural extension and rural financial assistance. These include PIK, PBVT, CLUSA and WOCCU. The banks are relatively inactive in the rural sector.

There is almost no formal sector financial participation in Nigerien onion marketing. Financial services are available to Ivoirian companies importing from Holland. Still most of the "semi-gros" and retail trade is undertaken on credit. The upstream fragility in the channel and the heavy burden of informal taxes contribute to retailer defaults on loans from wholesalers and to wholesaler insolvency.

Only the three or four private sector importers to be found in each country, and one informal sector player in Ghana, have access to formal credit facilities. None of the informal sector players have access to insurance. Most of the thousands of retailers have access to informal sector credit. Wholesalers advance goods to retailers with a theoretical delay of 15 to 20 days to repay the loan amount. Wholesalers often have considerable capital tied up in these arrangements. Retailer defaults on loans from wholesalers contribute to high business failure rates of smaller wholesale firms. Wholesalers receive credit from transporters as well; only half the transport costs are paid before delivery.

Almost every wholesaler has access to some market information. At the minimum this amounts to information on prices in the wholesale shipment distribution markets in the coastal countries at the time they make their orders in the producing zone. As telecommunications facilities improve, so does wholesalers' access to market information. Retailers have little access to any information beyond the expected arrival dates of shipments and the price they must pay.

Market Participants

Indicative data on the number of persons or villages active in onion production were collected in each country. In spite of impressive growth in production in Ghana, Burkina, Nigeria, and Benin, producers in Tahoua department, Niger remain the most important numerically.

Where possible, an attempt was made to assess the number of major shipment assembly agents and wholesale marketers operating in each major market town. In Arewa, Niger there are five major intermediaries organized under a single head intermediary. Overall, there are 20 intermediaries. The major intermediaries require them to be producers as well. In Galmi there are three major and probably 15 minor intermediaries. In addition, up to ten Togolese women are present at any given who serve as agents for importers in Lomé.

Hausa marketers of Nigerien origin play an important role in the onion trade in Côte d'Ivoire and in Ghana. In Abidjan there are five major Nigerien Hausa wholesalers, each handling about 1000 tons a month. In addition there are 10 to 15 Nigerien traders who together handle another 1000 tons a month, and approximately 100 more smaller scale operators, each of whom might handle 10 tons a month.

In Ghana, Songhay speaking Malians are also important onion market participants. There are probably five major Songhay importers in the Accra market and fewer in the Kumasi market. Bawku market is dominated by local Hausa speakers.

The most organized network of wholesalers and agents is based in Togo and involves women in all the major decision-making roles. There are several dozen women involved in the importing business, but they are headed by no more than five or six major players. Women are also the most important wholesalers of Nigerien onions in Benin, but competition from male marketers who buy in Nigeria is increasing.

Both men and women are active players in Burkina; one of the four most important wholesalers in Ouagadougou is a woman. She indicates that there are four other wholesalers working out of Ouagadougou.

Katako (Boukoki) market in Niamey is the major wholesale shipment distribution point in western Niger. About fifteen wholesalers are active in this market. They handle about two trucks a week of onions throughout the year, or 2,700 tons.

Estimates were made of the number of retailers active in a given market on a given day; however, firm estimates of the number of retail players are impossible to provide based on this rapid reconnaissance study. Thousands of people are involved in every country. For many, onions are just one of several product lines they carry.

A handful of firms import small volumes of onions into coastal countries for expatriate consumption from Europe, and play a minuscule role in African consumption behavior. European imports are most important in Côte d'Ivoire. Formal sector importers advance Dutch onions to Nigerien wholesalers for resale when Nigerien onions are in scarce supply. When Nigerien onions become plentiful, Nigerien wholesalers become competitors of the import firms. This creates considerable conflict between market participants, especially between African traders and one firm which controls 70-80 percent of the import market in Côte d'Ivoire.

Caution should be used in evaluating the numerical estimates of the numbers of players involved in onion marketing for the following reasons. First, the consultants did not visit producing areas in Zinder or Tillabery departments in Niger. Second, the consultants did not visit some important market towns such as Bouake, Côte d'Ivoire; Djougou, Benin; and Bobo-Dioulasso, Burkina Faso. Third, visits to Malanville, Benin and Bawku, Ghana coincided with the periods of lowest production. Fourth, no encounter was long enough to permit the consultants to earn the confidence of a major trader. Traders could not be followed through daily rounds, nor could the unloading and breaking of a major shipment be witnessed in any of the coastal towns. Consultants were not able to examine the notebooks in which informal sector marketers sometimes keep their accounts or the balance sheets of formal sector marketers or agribusiness enterprises. Finally, the study covered neither Sokoto and Zaria, potentially important producing regions in Nigeria, nor Lagos, which is an important wholesale market.

Onion production is likely to provide stable levels of employment for current and prospective producers over the next five years, not only in Niger but throughout the sub-region.

Major onion marketers are likely to provide stable levels of employment for themselves, the handful of assistants each employs, and some casual laborers over the next five years. Retail sales is likely to provide stable levels of employment as well. Turnover is somewhat high among intermediate wholesale marketers who may easily be driven out of the market by a single lost shipment. There is room for new market players in storage, packing, and retailing both in Niger and in the coastal markets. These players could provide incremental new employment possibilities. There is also room for a new actor to develop links with importers in the formal sector in Côte d'Ivoire. This player could export Niger onions packed in conformity with modern commercial norms.

Public Sector Participation

Neither, Benin, Ghana, nor Togo boast significant public sector competition in onion production or marketing. Côte d'Ivoire, Burkina and Niger do have technicians who have participated or will be participating in garden crop production related activities. UCOBAM, a parastatal production and marketing cooperative in Burkina, resorts and packs 100 tons of onions annually for sale in Ouagadougou. Innovations in storage, packing and transport are not imminent from public sector players at this time.

There is no evidence of direct control over onion marketing in any of the countries in the sub-region. Apart from the unsuccessful attempts of the Société Nigérienne de l'Arachide (SONARA), no marketing board has become involved in onion marketing.

Around the sub-region a few project activities will be undertaken to promote and/or regulate onion production. Most of these activities involve production. For example, an upcoming project in Côte d'Ivoire aims to increase production from 3,000 to 15,000 tons over five years. Ghana is concentrating on other non-traditional crops. Growth in private sector-initiated production can be expected in all of the countries in the sub-region except Togo, but including Nigeria.

Only in Burkina Faso and in Niger has the public sector become involved in onion marketing. Both cases involve experiments in improved storage and delayed sales; only the Nigerien experiences (with the Projet Intégré du Keita) have gone very far. FLEXFASO in Burkina is the only example identified where public sector support (from the Caisse Centrale de Coopération Economique, CCCE) led to long term private sector involvement in marketing, i.e. packing and retailing.

Nonetheless, initiatives are underway through donor funding to support agribusiness development. Among USAID Missions, USAID/Accra seems to have invested the greatest resources in agribusiness development. CCCE seems to be the most dynamic player in support of private sector development among other donors.

Onion Marketing Efficiency and Cost

Based on existing reports and data collected during July and August 1992, the consultants estimated price differences in onion marketing across space. The results do not represent a radical departure from the results of previous studies. Seasonal price variations of 100 percent and more are common in the coastal markets. These price differences across time primarily reflect supply and demand factors rather than storage costs and arbitrage functions. This is due to the absence of significant storage activity anywhere along the marketing channel.

Profit margins are modest given the high levels of risk involved. Inefficiencies are primarily due to three factors: limited on-farm crop storage and withholding; long marketing channels and mediocre communications and transport infrastructure; and illicit revenue seeking. Crop storage and withholding have been discussed above. Regarding marketing channel length, six intermediaries intervene between producer and consumer: a shipment assembly agent, a buying agent, a transporter, an import wholesale dealer, a "semi-gros" dealer, and a retailer.

Price differences between the wholesale and retail level reflect the bulk of "processing costs." These differences include the costs of storage, sorting, transport, and payment to the retail "sales force," i.e. the retail trader and his/her family members and casual employees.

Prospects for Onion Marketing Based on Existing Cost and Efficiency Levels

Producer Price Incentives

Farm level price data were collected in Niger, Ghana, Benin and Burkina Faso. There is remarkable consistency in these prices. Harvest prices in the main producing season average around 1,500 to 3,000 CFA per 100-130 kg sack. Price increases of up to 10 times this amount are reported for off-season (rainy season) production. Current prices provide adequate incentives to increase production and invest in improved agricultural technologies. Producers may expect to receive 23 to 96 percent of the FOB price depending upon the market served and the season of sales. Most probably receive about 50 percent.

As shown in Table 3, farmers' margins vary between 19 and 308 percent of variable production costs. Producers receive a fifth to a third of the FOB price at the Arewa and Galmi markets depending upon seasonal price variations and other factors. In depth study would be required to develop better estimates of costs and returns on investment.

It is possible to estimate likely adoption of improved technologies over the next six years; however, these estimates are likely to underestimate actual usage. Total acreage in onions may increase to 4,000 ha by 1996 as a result of PBVT's drilling new tube wells in the Tarka Valley. If so, the number of producers might increase from just under 1,700 (in 1991/1992) to over 3,000. If these pumping technologies diffuse to Keita, Bouza, and the Maggia Valley of Konni, further increases in onion production area might be expected.

If experiments with improved storage technologies are expanded and producers' experience with withholding onions for market price improvements is positive, improved revenues should encourage further expansion of production over the next five years.

Consumer Price Incentives

Nigerien onion consumption is difficult to estimate reliably without a major research input. Onion consumption data can be estimated by monitoring the quantity of onions consumed weekly in Niamey and using this quantity as a consumption indicator in other major population centers and the country as a whole. Using such an estimate, it appears that average annual per capita onion consumption is on the order of 2.79 kg. Assuming a population of eight million, national annual consumption would then be on the order of 22,400 tons. There is untapped demand for onions

outside of the major population centers. Due to unreliable distribution channels and seasonal price and supply fluctuations, onions are not always available to rural consumers at prices they consider reasonable.

There is no good source of wholesale or retail onion sales levels or trends. The only published source of data is official import/export figures and the price series available for some countries. These data allow only onion prices in the consuming countries to be estimated. No price series were available in Côte d'Ivoire or Benin. Long price series were available only from Ghana. These data show that prices rose 94 percent between 1987 and 1991 when adjusted for inflation. In Lomé, prices fell 35 percent over the same period, but this estimate is based on very poor quality data. In Ouagadougou, prices rose by 15 percent over the same period; the quality of this data is unknown.

There is considerable annual and inter-annual fluctuations in retail onion prices. In Ouagadougou, mean prices have varied from a low of 78 CFA/kg in April to a high of 356 CFA/kg over the past five years. During the same period, prices in Lomé have varied from a low of 319 CFA/kg in May to a high of 377 CFA/kg in October. Prices in Malanville, Benin vary from a seasonal low of 54 CFA/kg in May to a high of 296 CFA/kg in October. In coastal Beninois markets prices vary from a seasonal low of 164 CFA/kg in April to a high of 561 CFA/kg in November. These fluctuations are primarily due to seasonal changes in supply. However, lower overall prices on the Togolese coast compared to the Beninois coast, and comparatively smaller inter-seasonal fluctuations in consumer prices, reflect Togo's better overall market channel organization.

Consumers in the sub-region are avid onion users even when forced to use onions that do not lend themselves to African culinary practices. Although the cooking properties of Dutch varieties are said to be inferior to those of Galmi onions, demand for all types of onions remains strong. Price is a significant constraint to consumption. This constraint explains the preference for small onions in many retail markets (smaller onions are less expensive than larger onions), and the lack of loyalty to Galmi onions when consumers are faced with considerably less expensive European or Nigerian alternatives. Dutch onions enjoy a 64 percent price advantage over Nigerian onions in the off-season. Thus, Dutch onions imported into Côte d'Ivoire also appear in Lomé, Accra, Kumasi and Ouagadougou markets. The competitive price advantage of European onions should not be underestimated in contemplating an expansion of Nigerian onions production and export.

Reinforcement and extension of marketing channels would create economies of scale for wholesalers that, in turn, would reduce consumer costs throughout the marketing network. In addition, increased production and vastly increased on-farm storage in Tahoua should help to even out inter-seasonal fluctuations in consumer prices. However, considerable channel extension cannot be expected in the current commercial climate.

Agribusiness Investment and Gross Returns

Data were collected from informal sector marketers that allow returns on investments in trade to be estimated. Profits on sales can be calculated. Three estimates of gross returns on onion exports to Abidjan range from one to 10 to 145 percent of costs. Estimates of gross returns on exports to Cotonou, Benin range from 7 to 15 percent. Gross returns on exports to Lomé are estimated at 13 percent. It is relatively simple to estimate prices in Galmi or Arewa as well as transport costs

and official customs duties. For example, data was collected on per unit transport costs per unit of capital invested. These costs vary seasonally as a function of CIF price from a high of 100 percent to a low of eight percent. Per unit transport costs are fairly stable, averaging around 2,200 CFA/sack. Profitability, as marketers themselves point out, varies dramatically depending on the assumptions made regarding rent-seeking, retail market prices and other factors. For example, demand for onions was depressed in Togo during July and August 1992 because of the political crisis rocking the capital.

Traders undertake little investment in improving productive capacity because limiting fixed costs is one of the only ways they have of hedging against high levels of risk. Such investments would expose them to greater risk should one or more shipments be lost, and might expose them to increased rent-seeking by various policing agents. Some large marketers invest in trucks. Investments in storage facilities are kept to a minimum. Investments in water lifting equipment and on-farm storage are the least risky in the current political/economic climate.

Both formal sector importers in Côte d'Ivoire (SABIMEX and DISTRIMEX) are interested in Niger onions. Importers would be interested in very large quantities of onions of relatively uniform size, properly cured and sacked. Further, they would require that their Nigerien partners have access to modern communications technology, sufficient capital to open bank accounts, ability to furnish letters of credit, etc. Above all, importers want partners who can deliver specified amounts on time at specified prices. A few informal sector marketers could already meet such conditions with a minimum of technical assistance.

No formal sector actor is contemplating a major agribusiness investment in onion marketing or processing in the future. Ivoirian importers are hampered in making such investments by the lack of formal sector participants in Niger handling the volumes of goods the Ivoirian importers require. Nigerien exporters are hampered by a lack of access to capital, transport costs, packing requirements in coastal countries, and the barriers to entry constituted by the networks of informal sector marketers in the consuming countries.

Conclusions

Onions are an important crop for Niger. They are one of the few high value crops produced in the country. In addition, they enjoy a competitive advantage in regional markets, where the Violet de Galmi variety is known for its taste, and cooking and medicinal properties. The recent dramatic expansion in onion production is a response to a number of factors. Among these factors are drought and crop disease that have reduced production of other cash crops; population pressure; greater availability of inexpensive irrigation pumps; and high levels of demand for onions throughout the sub-region. Improvements in production technology, transportation and storage technology, if coupled with improved access to agricultural credit, could result in continued increases in production in Niger. Improvements in telecommunications and international transport routes could facilitate expanded marketing prospects. New participants in the market channeling could take immediate advantage of opportunities to profit from seasonal windows of opportunity in production and storage, linkage with marketers in the formal sector, and new packing techniques. More long-term opportunities are available through improving onion transport and extending marketing channels in the consuming countries. These opportunities for Niger's onions are threatened by rent-seeking, over-regulation of commerce, the expansion of onion production in Burkina Faso, Ghana, and Nigeria, and imports of European onions in the Ivoirian market.

Problems Encountered in the Channel and Possible Donor Interventions

A summary of problems in the onion marketing channel and possible donor interventions follows. Macro-economic policy and institutional problems are perhaps the most intractable and will require long-term solutions through bi-lateral and multi-lateral dialogue. Problems confronted by producers, cooperatives, traders and consumers are more tractable. However, enduring solutions to these technical and organizational problems require progress on the resolution of the larger policy and institutional problems that constrain the development of regional trade in West Africa.

PROBLEMS ENCOUNTERED IN THE ONION PRODUCTION AND MARKETING CHANNEL AND POSSIBLE DONOR INTERVENTIONS

PROBLEMS

Macro-economic/Institutional

Overvaluation of the CFA.

Loss of government revenues through rent-seeking.

Constraints to development of onion production and export because of rent-seeking by government agents.

POSSIBLE INTERVENTIONS

Macro-economic/Institutional

Initiate and sustain dialogue with GON on necessity for some action on overvaluation.

Hold round table meetings with GON officials to bring their attention to revenues lost to the treasury due to this problem.

Initiate counterpart fund to provide adequate salary support to customs, gendarmes, and police for a transition period.

Support RN/MAE/C efforts to negotiate suppression of internal customs and control points with ECOWAS/CEAO partners.

Hold round table discussions between truckers, wholesalers, customs, gendarmes, police, and RN/MOC and RN/MP/F on problems and progress towards resolution.

Broadcast in French and national languages regulations concerning vehicular maintenance, licensing, liberalized export rules, etc. both in Niger and in Nigerien communities abroad.

Monitor customs, gendarmes and police check points to ensure compliance with ECOWAS rules governing free circulation of persons and goods.

For a transitional period reduce commercial licensing fees to a minimum. Use counterpart funds to defray lost GON revenues.

PROBLEMS

Macro-economic/Institutional

Governmental cadre and ordinary citizens in Niger lack access to University level training in modern marketing practice.

Producers

Seed quality.

Seed availability.

Fertilizer quantity and type available.

Storage quality and quantity.

Liquidity at harvest.

Knowledge of market prices.

Absence of rural feeder roads.

Lack of investment capital.

Lack of means to counteract seasonal fluctuations in production.

POSSIBLE INTERVENTIONS

Macro-economic/Institutional

Donors might consider helping University of Niamey to develop a curriculum in modern business practice, esp. marketing and accounting.

Producers

Provide loans to private seed importing firm

Provide funding to INRAN and ONAHA, RN/MAG/EL to produce seed at Tarna and Galmi

Help private sector firm develop links with foreign suppliers

Help GON rethink its agricultural input supply strategy

Expand program of applied research and extension of improved on-farm storage based on BIT and Tarka project models

Expand funding for harvest storage loans and deferred sales based on Tarka project models

Improve telecommunications links between producing zones and consuming zones

Provide funding to private sector contractors to develop labor based feeder road construction projects on USAID/Accra model

Provide FFW funding for labor based feeder road construction

Expand CLUSA, CARE, and WOCCU project activities in the production zone. Consider providing short term solution to private banks' (BIAO, etc.) liquidity crisis

Expand applied research and extension on improved on-farm storage.

PROBLEMS

Lack of knowledge about demand structure in consuming countries.

Overvaluation of the CFA.

Cooperatives

Lack of "fonds de roulement" or operating capital.

Lack of storage capacity.

Lack of market contacts.

Absence of rural feeder roads.

Limited financial management capacity.

Limited knowledge of market prices.

POSSIBLE INTERVENTIONS

Expand funding for a program to provide PBVT/LWR water lifting units on credit to farmers in other producing zones and potential production zones on Niger's fadama lands, e.g. Dallols, Korama.

Improve telecommunications links between producing zones and consuming zones.

Facilitate encounters between market participants in consuming countries and producing zone

Initiate and sustain dialogue with GON on necessity for some action on overvaluation.

Cooperatives

Reinforce CLUSA, CARE and WOCCU training and financial support activities in producing zones.

Expand applied research and extension on improved on-farm storage.

Improve telecommunications links between producing zones and consuming zones.

Facilitate encounters between market participants in consuming countries and producing zone.

Provide funding to private sector contractors to develop labor based feeder road projects on USAID/Accra model.

Provide FFW funding for labor based feeder road construction

Expand CLUSA, CARE and WOCCU project activities in the production zone. Consider providing short term solution to private banks' (BIAO, etc.) liquidity crisis.

Improve telecommunications links between producing zones and consuming zones.

PROBLEMS

Limited knowledge about demand structure in consuming countries.

Overvaluation of the CFA.

Marketers

Confused procedures required for licenses.

Lack of knowledge about commercial legislation.

Ministry of Foreign Affairs staff in foreign embassies lack training in modern marketing practice.

Lack of telecommunications facilities.

Lack of incentives to conform to licensing legislation.

Disincentives to invest in improved infrastructure and expanded marketing channels.

High cost of informal taxes collected.

Delays in transshipment & delivery.

Mediocre state of cross-border highways.

POSSIBLE INTERVENTIONS

Facilitate encounters between market participants in consuming countries and producing zone.

Initiate and sustain dialogue with GON on necessity for some action on overvaluation.

Marketers

Publish and broadcast in French and national languages regulations concerning vehicles, commercial licensing, liberalized export rules, etc., both in Niger and in Nigerien communities abroad.

Reinforce Nigerien Embassy staffs with a donor-trained commercial attache whose tasks include briefing Nigerien marketers on export opportunities in Niger, transmitting and explaining commercial regulations in Niger and the sub-region, etc.

For a transitional period reduce commercial licensing fees to a minimum. Use counterpart funds to defray lost GON revenues.

Reinforce phone, fax, and telex links between producing region and the exterior by developing direct outside linkages.

Negotiate suppression of internal customs and gendarmes control points.

Hold series of round table discussions between transporters, wholesalers, customs, gendarmes, police, and Ministries of Commerce, and Plan and Finance on the problem of rent-seeking, restraint of trade and progress towards resolution.

Provide funds to strengthen and maintain cross border highway infrastructures.

PROBLEMS

Lack of storage capacity.

Lack of available modern packing and packaging products.

Rudimentary sorting and retail packaging.

Lack of means to counteract seasonal fluctuations in delivery to markets.

Conflict over use of non-Nigerien transport on Nigerien highways.

Lack of access to formal sector customers.

Lack of knowledge of modern marketing practice.

POSSIBLE INTERVENTIONS

Expand program of applied research and extension of improved shipment assembly storage based on BIT and Tarka project models.

Fund private sector partner to begin import of plastic net sacks from Ghana or European supplier. Work with transporters to build transport into onion shipping. Explore feasibility of local sack production. Explore feasibility of producing local tags with GALMI ONIONS and PRODUIT DU NIGER and orange, yellow and green labelling.

Work with private sector actor to develop net packaging for local sales of onions and other fresh produce on the FLEXFASO model.

Provide funds to strengthen and maintain cross border highway infrastructures.

Improve telecommunications links between producing zones and consuming zones.

Expand program of applied research and extension of improved shipment assembly storage based on BIT and Tarka project models.

Support working group of transporters, wholesalers and relevant government ministries to work out problems related to access.

Support groups such as GIE ALBASA which can serve as a link between informal and formal sectors.

Provide national language training in modern marketing practice.

PROBLEMS

Customers

Demand for Galmi onions is threatened by production of other violet and red onions in Benin, Ghana, and Burkina.

Only some customers are aware of the distinctive characteristics of Galmi onions; they may confuse Galmi onions sacked in Dutch bags with Dutch onions; they may confuse other violet-colored onions grown in Benin or Burkina Faso with Galmi onions.

Rural customers in Benin and Ghana have trouble obtaining Niger onions at affordable prices.

POSSIBLE INTERVENTIONS

Customers

Fund private sector partner to begin import of plastic net sacks from Ghana or European supplier. Work with transporters to build transport into onion shipping. Explore feasibility of local sack production. Explore feasibility of producing local tags with GALMI ONIONS and PRODUIT DU NIGER and orange, yellow and green labelling.

Work with private sector actor to develop net packaging for local sales of onions and other fresh produce on the FLEXFASO model.

Develop awareness-building radio & television commercials for broadcast in consuming countries promoting Galmi onions' spiciness (yagi), suitability for cooking and healthful qualities (Ghana).

Programs to strengthen and support distribution channels through support to private sector in Niger and support to GON for ECOWAS negotiations on liberalizing movement of perishables should help resolve this problem.

Table 1
Onion Production in Niger

Year	Area (ha x 100)	Production (Tons x 1000)	Yield kg/ha
1968	18	38.9	21.5
1969	17	27.4	16.11
1970	19	30.9	16.15
1971	21	36.0	17.14
1972	15	20.3	13.53
1973	17	29.0	17.05
1974	26	44.1	17.00
1975	26	70.8	27.23
1976	28	79.4	28.35
1977	20	62.7	31.35
1978	29	78.4	27.03
1979	34	104.3	33.68
1980	34	107.8	33.68
1981	8	17.1	21.39
1982	36	103.6	28.77
1983	19	53.9	28.36
1984	24	43.8	18.25
1985	29	62.7	21.62
1986	31	73.2	23.00
1987	34	108.5	31.20
1988	54	123.5	23.00
1989	64	220.0	34.00
1990	53	170.0	32.07
1991	64	196.0	30.62
Percent Increase From 1968	356	503.9	142.42

Source: RN/MAG/EL.

Table 2

Onion Exports Through Galmi Customs, Niger

Date	Volume (Tons)	Value (CFA)	Statistics Tax (CFA)
OCT 87	239.8	21,582,900	4,796,200
NOV 87	224.8	20,228,400	4,495,400
DEC 87	154.3	13,885,200	3,997,500
Sub-total	618.4	55,696,500	12,289,100
JAN 88	161.4	14,527,800	3,228,400
FEB 88	394.4	35,494,200	7,887,600
MAR 88	600.9	54,081,900	12,018,200
APR 88	1,353.9	121,854,600	27,078,800
MAY 88	2,551.2	229,611,600	13,281,200
JUN 88	2,828.2	254,539,800	14,141,100
JUL 88	1,970.8	177,372,000	9,854,400
AUG 88	1,961.8	177,087,800	9,834,800
SEP 88	1,032.5	92,924,800	5,163,500
OCT 88	N/A	N/A	N/A
NOV 88	520.2	22,398,000	932,300
DEC 88	662.0	19,860,000	595,800
Sub-total	14,037.4	1,199,752,500	104,016,100
JAN 89	285.4	8,562,000	256,860
FEB 89	235.9	7,077,000	212,310
MAR 89	952.1	28,563,000	856,890
APR 89	2,324.3	69,729,000	2,091,870
MAY 89	3,995.2	118,656,000	3,559,680
JUN 89	3,442.4	112,272,000	3,368,160
JUL 89	2,493.4	74,803,680	244,110
AUG 89	1,874.6	56,237,010	1,687,110
SEP 89	946.1	28,284,020	851,521
OCT 89	824.0	24,720,000	741,600
NOV 89	242.9	7,287,000	218,610
DEC 89	477.1	14,313,000	429,390
Sub-total	18,093.4	550,503,710	14,518,111

Table 2 (continued)

Date	Volume (Tons)	Value CFA	Statistics Tax (CFA)
JAN 90	340.5	10,215,000	306,450
FEB 90	1,680.0	50,400,000	1,512,000
MAR 90	2,423.9	72,717,000	2,181,510
APR 90	3,343.0	100,029,000	3,000,870
MAY 90	4,151.8	124,554,000	3,736,620
JUN 90	2,984.8	89,544,000	2,686,320
JUL 90	2,334.3	70,029,000	2,100,870
AUG 90	1,949.0	58,470,000	1,754,100
SEP 90	1,133.9	34,017,000	1,020,510
OCT 90	711.6	21,384,000	641,520
NOV 90	910.0	27,300,000	819,000
DEC 90	2,076.6	62,298,000	1,868,940
Sub-total	24,039.4	720,957,000	21,628,710
JAN 91	2,096.2	62,886,000	1,886,580
FEB 91	2,497.2	74,916,000	22,447,480
MAR 91	2,661.3	79,839,000	2,395,170
APR 91	3,592.8	91,778,400	2,753,352
MAY 91	3,817.9	114,537,000	3,436,110
JUN 91	4,004.7	120,141,000	5,189,940
JUL 91	2,341.7	70,251,000	3,161,295
AUG 91	2,109.1	63,273,000	2,847,285
SEP 91	N/A		
OCT 91	257.2	7,716,000	347,220
DEC 91	154.4	4,632,000	208,440
Sub-total	23,532.5	689,969,400	24,472,872
JAN 92	255.3	7,659,000	34,655
FEB 92	512.0	15,360,000	691,211
MAR 92	949.4	28,479,000	1,281,555
APR 92	2,014.6	60,483,000	2,721,735
MAY 92	2,916.2	87,486,000	3,936,870
JUN 92	1,945.6	58,362,000	2,626,290
Sub-total	8,593.1	257,829,000	11,602,316

Source: Lev and Gadbois (1988); Direction Régionale des Douanes, Tahoua.

Table 3
Comparison of Onion Production Costs (CFA)

Costs	Small-Group Pump Tarka Valley (PBVT)¹	ONAHA Gravity-fed On-Perimeter Galmi²	Private Diesel Pump Gaya³	Manual Lift System, Keita⁴	Small Off-Perimeter Pump Galmi⁵
Crops					
–Seed	48,555	80,000	(30,000) ⁶		20,000
–Fertilizer	5,125	13,350	20,000		13,000
–Insecticide	11,250	11,250			
–Transport					
Other Labor	28,450	180,000	30,000		38,000
–Plowing		10,000			20,000
Sub-Total	93,380	294,600	80,000		91,000
Land Rental		50,000		121,000	50,000
Irrigation					
–Fuel	23,868		10,944		
–Oil	4,949		2,298		
–Maintenance	5,000				
–Operator	2,000	10,000	84,000		54,000
Sub-Total	35,817	10,000	97,242		54,000
Amortization					
–Pump	5,212		74,000		160,000
–Motor	22,571				8,000
–Tubing	6,400		6,400		
–Wells			33,333		4,000
Sub-Total	34,183	700	113,733		172,000
Taxes	56,880				
Household Labor⁷	163,000	163,000	163,000 ⁸	163,000	
Marketing Costs⁹	12,600	12,600	12,600	12,600	70,000
Total Costs	395,860	530,900	466,575	296,600	437,000
Revenues					
–Onions	1,581,488 ¹⁰	870,480 ¹¹	555,000 ¹²	1,210,000 ¹³	788,400 ¹¹
–Other Crops	11,462				
Total Revenues	1,592,950	870,480	555,000	1,210,000	788,400
Gross Margin	1,197,090	339,580	118,425	25,400	401,400
Margin % Costs	302.4	64.0	19.0	308.0	80.4

¹PBVT 1991

²Direction Régionale de ONAHA, Konni, Zalla, et al., 1984

³Figures are based on interview data

⁴Calculations are based on SAA Keita's contention that it costs 20,000 CFA to produce one ton of onions

⁵Mahamadou, 1987

⁶Shadow cost of self-produced seed

⁷Assumes 326 days labor at 500 CFA/day

⁸Assumes all production costs are subsumed under family labor costs

⁹Assumes 315 CFA/sack of labor for sacking and transport

¹⁰Assumes a sales price of 36.5 CFA/kg

¹¹Assumes a sales price of 20 CFA/kg

¹²Reports on overall earnings figure provided by the farmer interviewed

¹³Assumes a sales price of 27.5 CFA/kg

References

- Lev, Larry S. and Millie A. Gadbois, 1988. Rapid Reconnaissance Study of Nigerien Onion Subsector: A Policy Oriented Analysis of Market Performance, GTS Report No. PIP/Niger/Jan 88/99. Moscow, ID: Postharvest Institute for Perishables/ USAID.
- Mahamadou, Saley, 1987. La Commercialisation des Oignons dans le Département de Tahoua. Cas de la Zone de Galmi, Cotonou: Centre Panafricain de Formation Coopérative.
- PBVT/SPA, 1992. Compte Rendu de la Campagne de Contre-Saison, 1990-1991 sur les Perimètres Collectifs. Madaoua: Fonds European de Développement/ Projet de la Basse Vallée du Tarka/ Service de la Production Agricole.
- Zalla, Thom, Glenn Anders, Walter Firestone, Michael Gould, Emile Malek, Emmy Simmons, Malcolm Versel, Teresa Ware, 1984. Niger Irrigation Subsector Assessment. Volume II, Annexes. USAID: Niamey.