

132 93191

# **CHAD**

## **PILOT PROJECT FOR FRUIT AND VEGETABLE MARKETING**

**A Project Paper  
(Final)**

***Submitted to:***  
Agency for International Development  
Chad

***Submitted by:***  
Agricultural Cooperative Development International  
50 F Street, N.W., Suite 900  
Washington, D.C. 20001  
Phone: (202) 638-4661  
CARINET: ACDI or 2298  
FAX: (202) 626-8718  
Telex: 160923

October 1989

## TABLE OF CONTENTS

	Page
Acronyms, Terms and Abbreviations	1
<b>I. SUMMARY PROJECT DESCRIPTION . . . . .</b>	<b>1</b>
A. PVO Applicant . . . . .	1
B. Government of Chad Implementing Agency . . . . .	1
C. Summary of Financial Plan . . . . .	1
D. Project Goal . . . . .	1
E. Project Purpose . . . . .	1
F. Project Background . . . . .	1
G. Summary Description . . . . .	3
H. Summary of Analyses . . . . .	5
I. Project Issues . . . . .	6
J. Project Waivers . . . . .	6
K. Design Team Members . . . . .	6
<b>II. PROJECT RATIONALE AND DESCRIPTION . . . . .</b>	<b>7</b>
A. Project Rationale. . . . .	7
B. Project Objectives . . . . .	13
C. Project Components . . . . .	15
D. PVO Inputs to be Financed by AID . . . . .	17
E. PVO Inputs . . . . .	17
F. Other Inputs . . . . .	18
<b>III. COST ESTIMATES AND FINANCIAL PLAN. . . . .</b>	<b>20</b>
A. Summary Cost Estimate . . . . .	20
B. Financial Plan . . . . .	20
C. Cost Estimates of Other Inputs. . . . .	21
<b>IV. IMPLEMENTATION PLAN. . . . .</b>	<b>22</b>
A. Implementation Responsibilities . . . . .	22
B. Collaboration with Other Donors and NGOs. . . . .	25
C. Procurement Plan . . . . .	26
D. Organization Chart. . . . .	26a
E. Project Implementation Schedule . . . . .	26b
<b>V. MONITORING PLAN . . . . .</b>	<b>27</b>
A. ACDI Project Management . . . . .	27
B. AID Liaison . . . . .	28
C. GOC Project Management . . . . .	28
D. Reporting Responsibilities . . . . .	28

a

## VI. SUMMARY ANALYSES

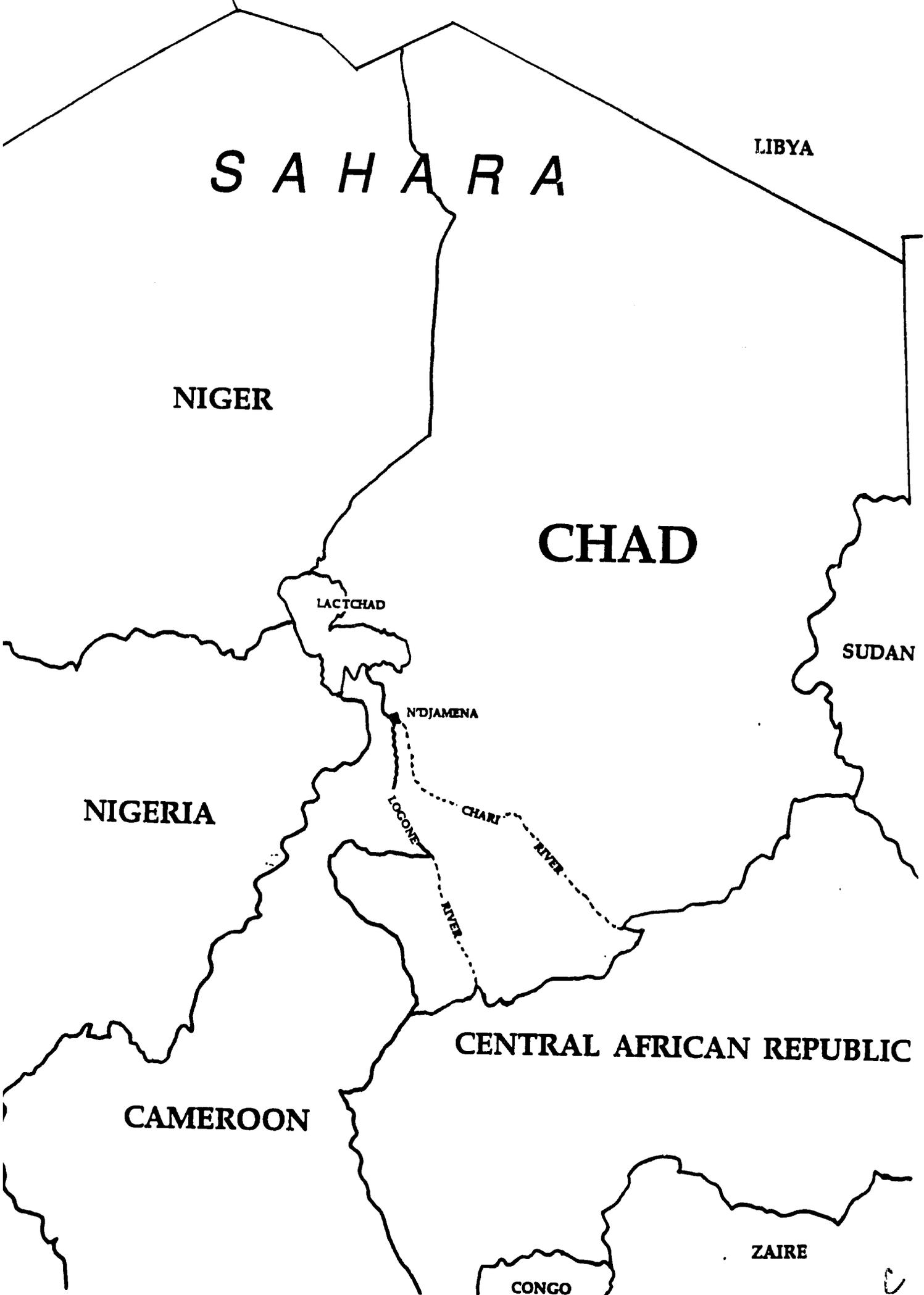
A. Summary Social Soundness Analysis . . . . .	29
B. Summary Economic and Financial Analysis . . . . .	31
C. Summary Technical Analysis . . . . .	32
D. Summary of Initial Environmental Examination . . . . .	34

## VII. EVALUATION PLAN . . . . . 35

A. Implementation Progress Evaluation . . . . .	35
B. Formative Evaluations . . . . .	35
C. Summative Evaluation . . . . .	36

## ANNEXES

- A. Maps
- B. Project Agreement with GOC (to be added when signed)
- C. Position Descriptions
- D. Logical Framework
- E. Groupement Profiles
- F. N'Djamena Market Survey
- G. Social Soundness Analysis
- H. Economic and Financial Analysis
- I. Technical Analysis
- J. Initial Environmental Examination
- K. Detailed Cost Estimate with Budget Notes
- L. Illustrative Commodity and Equipment List
- M. List of Contacts
- N. Bibliography



## ACRONYMS AND ABBREVIATIONS

<u>Acronym</u>	<u>French</u>	<u>English</u>
A. I. D.		Agency for International Development
B. I. E. P.	Bureau Interministerial des Etudes et Programmes	Interministerial Studies Bureau
CARE		Cooperative for American Relief Everywhere
CTT	Cooperative de Transporteurs Tchadienne	Chadian Transporters Cooperative
FED	Fonds Europeen de Developpement	European Development Fund
GOC		Government of Chad
NGO		Non-Governmental Organization
ONADEH	Office Nationale pour le Developpement de l'Horticulture	National Horticultural Development Office
ONDR	Office Nationale pour le Developpement Rural	National Rural Development Office
ORT		Organization for Rehabilitation through Training
PVO-DIP		PVO-Development Initiatives Project
REDSO		Regional Economic Development Services Office/A.I.D.
SECADEV	Secours Catholique au Developpement	Emergency Catholic Relief Organization
UNDP	Programme des Nations Unis pour le Developpement (PNUD)	United Nations Development Program
VITA		Volunteers in Technical Assistance

**CHAD  
FRUIT & VEGETABLE MARKETING PILOT PROJECT**

**A Project Paper**

**I. SUMMARY PROJECT DESCRIPTION**

**A. Private Voluntary Organization (PVO) Applicant:** Agricultural Cooperative Development International (ACDI), 50 F St., N.W. Suite 900, Washington, D.C. 20001 Telephone:(202) 638-4661 Telex: 160 923 FAX: (202) 626-8718 Cable: AGCODEV

**B. Government of Chad (GOC) Implementing Agency:** to be defined.

**C. Summary Financial Plan**

AGENCY	YEAR 1	YEAR 2	YEAR 3	TOTAL
AID	\$1,120,505	810,738	498,159	2,429,403
ACDI	\$21,450	21,450	14,300	57,200
THIRD PARTY	\$101,200	119,160	36,000	256,960
TOTAL	\$1,243,155	949,188	548,459	\$2,743,563

**D. Project Goal**

The goals of this project are to increase the income of small farmers, and to augment the availability and affordability of fresh fruits and vegetables to consumers by improving the harvesting and crop-handling techniques and marketing systems utilized by three to four private groups of small farmers in the areas of Karal and Dagarmassa, Chari-Baguirmi Prefecture, Chad.

**E. Project Purpose**

The project purpose is to improve the efficiency of private-sector marketing systems within the project-targeted areas through the development and application of marketing models utilizing replicable interventions.

**F. Project Background**

ACDI's current involvement in Chad began in September, 1988 with a visit to N'Djamena by the then Project Assistant/Africa Region. USAID/Chad had expressed prior interest in addressing the marketing problems faced by farmers who had increased production but were having difficulty in selling the increased production.

ACDI submitted a concept paper to USAID/C in March, 1989 for a project to form private-sector groups for the marketing of perishable agricultural commodities under the PVO Development Initiatives Project (PVO-DIP/677-0051).

## Fruit & Vegetable Marketing Pilot Project - Chad

The concept paper proposed the performance of a study to determine the feasibility of implementing a marketing project to: 1) provide technical assistance in marketing to groupements villageois pour la commercialisation (GVC's); 2) undertake the actual marketing of produce; 3) organize marketing trials; 4) investigate marketing channels and costs; 5) conceptualize new marketing strategies; and 6) formulate guidelines and policies to overcome problems associated with the marketing of perishable goods.

USAID/C then requested ACDI to perform a feasibility study and write a project paper, and agreed to finance the costs of that work through a buy-in to ACDI's Cooperative Program Support Grant (CPSG) (OTR-0192-A-00-9052-00). A design team, consisting of the Project Coordinator/Africa Region and a consultant, went to Chad in June-July, 1989.

As part of its methodology, the ACDI team consulted with the Government of Chad (GOC), USAID/C, and non-governmental organizations (NGO's) working in Chad. During several discussions with officials of the Ministries of Plan, Commerce, and Agriculture/GOC, the government expressed concern that the proposed project should be sustainable, and that it should be complementary to the efforts of other NGO's working in Chad.

The ACDI team met with several of the NGO's operating under the PVO Development Initiatives project to explore possible avenues of collaboration. All had recognized the marketing problems faced by their farmer clients and had begun to make plans to incorporate marketing strategies into their agricultural production projects.

As a result of further talks with ONADEH, ONDR, UNDP, FAO/PIC, SECADEV, and USAID/C, the design team focused on two important vegetable and fruit production areas: Karal and the irrigated perimeters along the Chari and Logone rivers in the Dagarmassa area (see map Annex A). These areas, given their orientation to the N'Djamena market, will allow for ample testing of the marketing-system models to be developed and will facilitate their replication.

The design team, along with a representative from ONADEH, spent three days in the Dagarmassa area, south of N'Djamena, interviewing and visiting the members of thirteen groupements and inspecting their fields, as well as interviewing representatives of ACRA, CHARB, and PIC. The team then spent two days in Karal where it met with representatives of SECADEV and ONDR and with the groupements of three villages in Guitte, Karal, and Baltram.

Meetings with groupements averaged two hours in duration, and touched upon such topics as group structure and organization, volume of production, and problems associated with the harvesting, packing and transportation of produce. Possible solutions to those problems were also discussed.

The data utilized in this proposal is a combination of the information gathered from those meetings with groupements, a marketing survey of the N'Djamena market conducted by the design team, and numerous reports and statistics gathered from government agencies, NGO's, and USAID/C.

## **Fruit & Vegetable Marketing Pilot Project - Chad**

### **G. Summary Project Description**

Interventions focusing on agricultural production in Chad have not had sufficient impact on farmer incomes and food prices due to inappropriate and inefficient marketing systems, specifically: improper harvesting and post-harvest handling techniques; lack of storage facilities; unavailability and high cost of transport; lack of marketing infrastructure; and the absence of marketing information systems.

Given the foregoing, the goals of the proposed thirty-month pilot project are to increase farmer incomes and the availability and affordability of fresh fruits and vegetables. These goals will be achieved by improving the efficiency of private-sector marketing systems through the development and application of models employing replicable interventions.

The activities which will bring about goal achievement are the development and application of improved harvesting and post-harvest produce handling techniques, construction of improved storage facilities, and the establishment and testing of a marketing information network between producers, transporters, and sellers.

All project activities will take into consideration the experience and recommendations of the participating groupements. Groupements are defined as locally organized groups of small farmers working together toward the common goals of increased income and financial stability. Their support will be enlisted in project implementation. Farmer-clients will be required to contribute in-kind labor and materials to project activities, wherever practical.

The project will be managed by an expatriate technical assistance team which will consist of a Marketing Specialist who will serve as Chief of Party (30 months), and a Product Engineer (30 months). There will also be an office manager in N'Djamena who will have as primary responsibilities the efficient management and operation of project headquarters (see Annex C for complete job descriptions). These advisors will collaborate with the Ministries of Agriculture and Commerce, and the extension agents at SECADEV and ONDR in Karal, who will play a major role in the transfer of technology to the Karal groupements. It is further planned that an ONADEH agent and a Peace Corps volunteer will participate in the project during its second year of operation in the Dagarmassa area, providing technical assistance in crop handling and storage. Eleven months of short-term consultancy time will be budgeted for performance of specific marketing-related tasks and studies.

The project consists of three components which will deal with broad aspects of marketing and marketing technology. They are:

#### **Product Technology**

The activities to be conducted under this component will be the design and adaptation of improvements in a) harvest and post-harvest produce handling, such as proper cutting techniques, isolating infected or diseased fruit, and using harvesting flats to transport produce from field to storage; b) conditioning, grading, and quality control, such as washing produce to remove field heat and using grading tables; c) packing containers of various designs and specifications; d) food storage and

## **Fruit & Vegetable Marketing Pilot Project - Chad**

conservation, such as low-cost, low-maintenance desert-cooling systems and storage depots; and e) food processing and transformation, such as improved drying methods.

To administer this component, the project will establish a Product Technology Unit (PTU) staffed by one long-term Product Engineer, based in Karal. The Product Engineer will be supported by extension agents from ONDR and SECADEV, who are currently working in production-related activities with the groupements.

The PTU will also operate the technical training component of the project. Producers will be trained in improved harvesting, packing, and storage techniques; sellers in improved handling and storage; and operators in the proper care and maintenance of the cooling facilities and other equipment. The PTU will supervise construction of conditioning sheds and storage facilities, and will coordinate interaction between the producers and sellers, and the organization of field days, demonstrations, and regional trips for training purposes.

### **Marketing Logistics**

This component of the project will be carried out by a Marketing Logistics Unit (MLU) which will have as its primary function coordination between producers, transporters, and the market. This unit will be headed up by the Marketing Advisor/Chief of Party, with the support of two Logistics Officers, one based in Karal and one in N'Djamena. These Officers are to be seconded by the GOC. Radio communication will be established between N'Djamena and Karal and, later, Dagarmassa for transmission of up-to-date market information.

The MLU will be responsible for the coordination of production, transport, and sales, and the implementation of trial shipments. The latter will involve the arrangements and negotiation of contracts between transporters, sellers, and buyers in an attempt to insure the availability of sufficient means of transport for the timely forwarding of produce ready for the market.

Trial shipments will test: a) containers and packing techniques; b) carriers and transportation arrangements; and c) market segments and sales options. The project will pay to producers an agreed-upon farmgate price for produce used in these initial "test runs". Proceeds from sales of trial shipments will be put in a fund to finance future trial shipments or other costs associated with developing improved marketing mechanisms.

Other important activities to be performed by the MLU will be training, in collaboration with the Dutch volunteers (SNV), producers and sellers in marketing-related management practices, e.g. the keeping of complete records on production and farmgate prices, and cash flow management. The MLU will also monitor harvests and forecast outputs in an attempt to even out the flow and distribution of produce on the market throughout the year.

### **Market Intelligence**

The third project activity component will be handled by a Marketing Intelligence Unit (MIU) staffed by a Market Intelligence Officer, to be seconded by the GOC,

## **Fruit & Vegetable Marketing Pilot Project - Chad**

and two full-time surveyors. Their responsibilities will be to gather, process, and disseminate data on production trends, price variations, volume and patterns of shipment arrivals, market behavior, consumer preferences and purchasing habits, and export opportunities. It will also monitor both official and unofficial transport and trade practices. These issues will be discussed in a policy dialogue to be initiated by the project and USAID/C with the GOC.

The MIU staff will compile and analyze the data and submit periodic reports to the Product Technology and Marketing Logistics Units who will use the data to formulate effective marketing strategies, policies, and models.

### **H. Summary of Analyses**

It has been concluded that the project is feasible in all aspects studied: sociological, economic/financial, technical, and environmental. The following summarizes the analyses found in Annexes G through J.

#### **Social Soundness**

The project will operate within existing traditional group structures. The proposed participants are active and viable groupements. Since the proposed interventions are simple, practical, and respond to the felt needs of the participants themselves, the proposed activities will not encounter adverse group and/or individual resistance.

#### **Economic/Financial**

As this is a pilot project where various marketing techniques and strategies will be tested, it will be extremely difficult to generate a positive cost-benefit stream during the two and one half year life of the project. According to the economic/financial analysis, a positive rate of return can be achieved by the project if, by the fourth year of operations, total post-harvest losses can be cut by half, transportation costs can be reduced by at least half, and wholesale prices increased by fifty percent. However, ACDI feels that because the market determines price, more realistic project goals would be to effect twenty-five percent reductions in both harvest loss and transport costs. These reduction in costs to the farmer would, in normal market situations, lead to reduced wholesale prices and thus reduced prices to the consumer.

Recognizing the current financial difficulties of the GOC, efforts have been made to keep recurrent costs to a minimum. The project will not purchase equipment but will put the groupements in contact with credit sources if the members decide to purchase equipment on their own. The project will attempt to work with the producers to organize and create self-perpetuating, profitable, marketing systems with the constant aim to replicability. Project activities will require the full support of the groupements before they are undertaken, helping to insure a long-term commitment to those activities.

#### **Technical**

The technical component of the project centers around the introduction of simple, cost-effective techniques designed to prolong the shelf-life of fresh produce. Only

## **Fruit & Vegetable Marketing Pilot Project - Chad**

intermediate processing systems or technologies that have already been tested in Chad or in countries with conditions similar to those found in Chad will be applied. Examples of technical improvements are: local manufacture from locally- available materials of harvesting flats; cooling devices using wind or solar energy; and protected drying slabs and trays for improved drying of okra and tomatoes.

### **Environmental**

An initial environmental examination was performed by A.I.D./W and it was determined that the project would not require any environmental action, as interventions are focused on marketing and not production. However, mid-term and final evaluators will determine whether any large and/or obvious environmental impacts are taking place.

### **I. Project Issues**

Two major issues were identified which could adversely impact on achievement of project goals. They are: 1) the almost total lack of data on fruit and vegetable production in Chad, and 2) the lack of a transportation infrastructure.

The team encountered difficulty in locating statistical data on fruit and vegetable production and marketing in Chad. Available statistics varied so greatly from report to report as to call question to their reliability. Several studies on fruit and vegetable production are currently being performed, but results will not be published before submission of this project paper. The design team identified several areas in which studies could be of assistance in developing a clearer idea of how the market operates.

Lack of roads and the poor condition of the existing roads are major problems faced by the groupements. In addition to the disrepair of the roads, other variables make it difficult, if not impossible, to predict the future of the transport system in Chad. For example, there is UNDP/PAM's project to privatize its fleet of food aid trucks; the 6eme FED's plan to build a road from Mani to Karal; a multi-lateral project to build a road from N'Djamena to Mani; and the dismantlement of the transport cooperative CTT. More information is needed on the transport system in order to begin to determine the most efficient and inexpensive ways for a farmer to bring his produce to market.

### **J. Project Waivers**

The PVO Development Initiatives Project has a blanket source and origin waiver, permitting the purchase of vehicles, motorcycles, and spare parts from AID Geographic Code 935 Countries.

### **K. Members of Design Team**

Anne Whitlock, Groupement Development/Team Leader, ACDI  
Knut Pelzer, Marketing Specialist

## **II. PROJECT RATIONALE AND DESCRIPTION**

### **A. Project Rationale**

#### **1. Background of Fruit and Vegetable Production, Markets, and Participants**

During the 1970's, the yearly production of fruits and vegetables for the N'Djamena market was about 2.200 metric tons. This met the needs of the city's population and even allowed for some export to Europe. Production was severely disrupted and even halted altogether during the drought and war years of the 1980's. Only recently have producers started growing fruits and vegetables in quantities above a subsistence level. In the meantime, the population of N'Djamena has more than doubled. All this has led to severe shortages of fruits and vegetables and high prices. Because the consumer's purchasing power is low, they have become luxury items unaffordable to the vast majority of Chadians.

To improve the Chadian diet and to conform with the GOC's goal of making Chad self-sufficient in food production, several agricultural production and crop-diversification projects have been initiated. In order to better coordinate those projects, the Office Nationale de Developpement de l'Horticulture (ONADEH) was created in 1985, and the Office Nationale de Developpement Rural (ONDR) was strengthened. All of these projects have focussed exclusively on increasing food production.

Farmers consider fruits and vegetables primarily as cash crops in Chad. The main production areas, therefore, are located near urban markets, particularly N'Djamena, which accounts for about one-half of the country's total urban population. There are smaller markets in Sarh, Moundou, and Abeche, but the vast majority of production is centered around N'Djamena, which also has a more developed infrastructure and a larger expatriate population, hence a bigger market, than the other cities.

Large numbers of producers in the Dagarmassa area are situated along the banks of the Chari and Logone Rivers which permit field irrigation, known locally as "perimeters". Another important production area is located close to the southern part of Lake Chad near the town of Karal. Here, farmers practice recessional irrigation, relying on the overflow from the annual flooding of Lake Chad to irrigate the fields.

There are more than fifty groupements producing on irrigated perimeters along the Chari and Logone Rivers. In Karal, there are more than one hundred six groupements farming in flood recessional areas. Most groupements keep only approximately one-half of their land under cultivation. Technology is primitive: most farming is done with hoes with only a small percentage of farmers use plows and oxen. Purchased seeds, fertilizers, and pesticides are rarely used because farmers lack the resources to buy them. Farmers in the irrigated perimeters often lack the capital to buy diesel fuel and spare parts for the water pumps and, hence, many perimeters are not functioning.

Yields are variable. Crops are often subject to failure through disease or insect infestation. Under favorable conditions, the yields can be quite high (see Annex I

## **Fruit & Vegetable Marketing Pilot Project - Chad**

for crop yield data). The main fruit and vegetable production season is between December and March, with only onion and okra being produced through the hot season months of April, May, and June. Production of vegetables during the rainy season is very limited due to the priority given to cultivation of cereal crops and the high incidence of plant disease at this time.

The village marketplace has traditionally been one of the mainstays of Chadian society. It is where friends and neighbors meet, usually once a week, to exchange goods, news, and gossip. Small quantities of food, usually the excess over family consumption, are traded for other essential commodities such as salt, sugar, cooking oil, and kerosene.

When the absorptive capacity of the village economy is reached, the farmer seeks new and larger markets which, in Chad, primarily means N'Djamena. To participate in the N'Djamena market, the producer must learn a more complex and segmented marketing system, one which does not always work in his favor, and where events often occur beyond his control.

The participants in the N'Djamena market system, which basically includes six marketplaces, are transporters, wholesalers, and retailers. Most transporters are based in N'Djamena. They include a range of people from those who head-load goods to drivers of thirty-ton trucks. Transport is either carried out as a service reimbursed in cash or in trade for commodities for resale, the latter arrangement the one more frequently applied.

Wholesalers are generally small and often act as both wholesaler and retailer. Large wholesalers with trucks number around twelve, all of whom are males. They tend to specialize in one or two products or supply sources, such as onions from Abeche or fruit from Cameroon. Wholesalers sell mostly to retailers and, on occasion, to other wholesalers or directly to consumers. Almost all transactions are carried out on a cash basis.

The retailers can be categorized by size. Large retailers are those who also act as wholesalers; medium retailers generally maintain a space in the market large enough for tables and sometimes have an awning and a storage room; small retailers are those with a small space, often only a mat on the ground to display their produce, makeshift stands, and shading. Women make up roughly one-half of the approximate one hundred seventy five fruit and vegetable sellers with permanent space in the market. Permanent space is obtained by paying a tax to the mayor's office.

Retailers tend to limit their stands to a few commodities. During the rainy season, they may carry only one item. They buy mostly from contractors on a cash basis. Sales are also made on a cash basis.

The institutional market in N'Djamena includes the French Army base, and a number of supermarkets, restaurants, and hotels, catering mainly to the expatriate community. In-season fruits and vegetables are provided by local expatriate intermediaries and out of season are imported from France and neighboring Nigeria and Cameroon. The project will seek inroads to this market by the groupements.

## **Fruit & Vegetable Marketing Pilot Project - Chad**

Several agents, a large number of them women, operate in the N'Djamena market. They charge a flat fee of 250 CFA (US\$ .80) per sack of produce. They take the produce on consignment, sell it for the producer, and pay him after the sale is made.

The principal vegetables sold on the N'Djamena market are: tomato, okra, onion, and melon, which taken together account for approximately eighty per cent of the total harvested tonnage. Other vegetables such as eggplant, green beans, peppers, and leeks are not indigenous, relatively unknown, and, therefore, not purchased by the average consumer. However, they are increasing in popularity.

Production figures for Karal and Dagarmassa, supplied by SECADEV extension agents, are extremely variable, and show the irrigated perimeters of Dagarmassa producing between 3,000mt to 4,000mt of produce on 300 to 400 hectares. Figures for Karal show production of almost 34,000mt, with only a small portion (30%) of that amount being sold due to post-harvest spoilage, (see N'Djamena Market Survey in Annex F for details).

With the dissolution of the Cooperative des Transporteurs Tchadiens (CTT), which had a virtual monopoly on road transport and charged outrageous prices, transport service in the out-lying areas is expected to improve. Transport is generally hindered, however, by poor road conditions, limited capacity, and poor maintenance of vehicles.

Lack of communication and information also aggravates the producers' problem of getting his produce to market on time and in good condition. Several road projects are underway which will help alleviate this situation.

Market storage facilities are limited to mud or cement rooms where produce is stored overnight under hot, unventilated, and dirty conditions.

### **2. Problem Statement**

During the past few years, the GOC and donor agencies have met with some success in increasing agricultural production, but these efforts have not had sufficient impact or effect on diet and incomes due partly to the inefficiency of the marketing systems.

Chad is an agrarian society with each family producing enough to meet its own food needs and engaging in limited trade with its neighbors as a complement to food production. There has not been an incentive, therefore, to build marketing networks. With colonialization and the resulting emphasis on cash crops, the need for roads and market-storage facilities, and for information on fruit and vegetable marketing became more apparent.

The droughts and war disrupted Chad's already-fragile infrastructure and heavily damaged storage facilities and roads through artillery bombardment and the use of heavy trucks. Due to the high cost of the war, the GOC has for years neglected the maintenance of paved roads. Road transportation has become very slow, unreliable,

## **Fruit & Vegetable Marketing Pilot Project - Chad**

and expensive, and has acted as a disincentive for farmers to increase production over subsistence levels as they are unable to move their produce to market.

### **3. Constraints**

The small farmer in Chad is confronted by a mind-bending array of problems and difficulties in marketing his perishable fruits and vegetables. Some of those problems and difficulties will act as constraints to achievement of project goals and objectives, and are outlined below;

#### **General**

- increases in production without a concomitant improvement in marketing of excess produce resulting in crop loss;
- poor condition of roads and lack of a communications infrastructure;
- insufficiency and unreliability of the transport fleet and facilities;
- weakness of support services, lack of credit for inputs, and little extension service to farmers;
- unreliable statistical data;
- lack of operating capital at all stages of the marketing chain;

#### **Technical**

- the concentration of production over short periods of time and consequent market gluts;
- inappropriate harvesting practices, resulting in extremely high post harvest losses;
- inefficiency, unreliability, and high cost of transport, both from field to collection point and from farm to market;
- inadequate produce-conditioning and packaging facilities and techniques;
- lack of food-conservation and processing technology, and fresh-produce storage facilities.

#### **Groupement-Related**

- formation of the majority of groupements was contrived for the purpose of receiving foreign assistance with an ensuing lack of motivation and initiative;
- limited management skills and experience; lack of scales, weights, and measures; absence of record-keeping;

## **Fruit & Vegetable Marketing Pilot Project - Chad**

- distrust among groupement members and between groupements of different ethnic groups, making coordination difficult.

### **Marketing-Related**

- absence of market information, including data on prices, volume, and market behavior and response;
- lack of effective communication systems and the resulting lack of coordination between the various constituents of the marketing chain;
- low purchasing power of consumers;
- lack of information on consumer preferences, behavior, and response.

### **4. Project Design Methodology**

Three factors were taken into consideration in the determination of the project-target areas. They were the location of the site, the character of the groupements, and crops being grown. The following summarizes those factors and explains how each was evaluated. The design team collected data in the field through surveys and questionnaires concerning the organization, structure, and marketing activities of the groupements. The team spent a total of five days in the field and spoke directly to fifteen delegations of groupements in village meetings averaging about two hours each.

#### **Site Selection**

The project will operate in the Karal and Dagarmassa areas of the Chari-Baguirmi prefecture, in which both the irrigated "perimeters" and recessional flooding systems of irrigation are employed.

The irrigated perimeters permit year-round production of fruits and vegetables, allowing producers to diversify their production and spread it and sales throughout the entire year. The main constraints to using the perimeter system are the high cost of fuel, spare parts, and ongoing maintenance of the pumps required to lift the irrigation water. The problem with the recessional-flooding technique is that the farmer is limited by the availability of flood water from the lake both in selection of the crops he can produce and when he can produce them.

The project will initiate activities in Karal, where the recessional-type of agriculture is practiced. This area has the greatest productive capacity in terms of both human and soil resources. These farmers can also maintain year-round production, with most fields producing three harvests per year. Moreover, it is an area with an established agricultural extension infrastructure. This is due in great part to the efforts of SECADEV, which has done excellent work in organizing and developing the participating communities, to the extent that they have formed a federation.

## Fruit & Vegetable Marketing Pilot Project - Chad

In the second year of project operation, once trial shipments have been undertaken in Karal, project contact will be established with groupements from Dagarmassa and N'Gouma.

The Dagarmassa/N'Gouma groupements are situated relatively close to N'Djamena. In addition, their relatively constant river-water supply allows for production of different crops. This gives these groupements considerable flexibility in meeting the changing demands of the marketplace, and will allow them to concentrate on supplying to the institutional market, i.e. restaurants, hotels, hospitals, and specialty supermarkets in N'Djamena. The Dagarmassa groupement members also appear to be better educated than those from other groupements. This, along with a certain business "savvy" and the fact that they own their own trucks, will further enhance their ability to deal with the market in N'Djamena.

### Groupement Selection

The design team interviewed more than fifteen groupements along the Chari and Logone Rivers in Dagarmassa, in Karal, and in the south in the vicinity of Guelendeng. Within those groupements, there were found striking differences in mentality, education, and organization. The groups near Guelendeng, in particular, had experienced previous contact with external donor organizations and appeared to be more interested in what they could get out of the project as opposed to what inputs would be required of them.

The groupements in Karal expressed a need to organize themselves before accepting outside aid. To what degree this reflects an understanding of their problems is open to question. The fact remains that they were by far the most articulate in expressing their needs and problems.

The difference in education levels was also evident in the groupements close to N'Djamena. They seemed to know exactly what their problems are, the constraints they face, and what they expect from a donor agency. Other groupements, near Guelendeng, were composed mostly of village elders, who also knew the problems facing them, but who were much more reticent in discussing those problems with the team members.

Although all the groupements interviewed claimed to have a coordinating committee, persistent questioning revealed that many committees existed in name only and did not meet regularly. The groupements in Karal, Guitte, and Baltram, however, articulated well-defined responsibilities for each committee member who reported regularly to the committee and to the general assembly.

Due to the limited proposed timeframe of the project, it is critical that the project work with viable groupements. The criteria used in selection of project participant groupements were, therefore: activeness, as expressed by the amount of land currently in production, production capacity, and work ethic; organization, as shown by definition of responsibilities and overall management style; and entrepreneurship, as manifested through creativity of ideas, willingness to take risks, knowledge of the market, and willingness to learn and apply new techniques. A summary description of groupement profiles can be found in Annex E.

## **Fruit & Vegetable Marketing Pilot Project - Chad**

Results of analysis indicated the groupements having the most project potential as Karal, Guitte, Baltram, and N'Gouma in the Dagarmassa area.

### **Crop Selection**

Several factors were considered in identifying the crops on which the project will focus. They were: the Chadian diet; the purchasing power of the average consumer in N'Djamena; and the weekly amount spent by consumers on fruits and vegetables. Also investigated was the effect on shelf-life of specific fruits and vegetables through the introduction of improved harvesting and handling techniques. The design team, assisted by three experienced Chadian interviewers, conducted a market survey to gather data on those items.

Given the results of that survey, plus information from the national Office of Statistics and NGO reports, it was decided to concentrate on crops with a proven food, barter, and market value. These were determined to be okra, locally known as gumbo, onions, tomatoes, and chili peppers. These food crops enjoy wide use by Chadian families of all socio-economic levels and ethnic backgrounds. Other vegetables such as squash, melon, cucumbers, and leeks are now beginning to find their way into the Chadian diet, but are still relatively unknown and too expensive for the average household. If initial project endeavors with the aforementioned four more-accepted vegetables prove successful, experimental trials with the lesser-known and more expensive vegetables will be undertaken during the second production year (See Annex F for details on the market survey).

### **B. Project Objectives**

#### **1. Project Goal**

The goals of this project are to increase the incomes of small farmers and the availability and affordability of fresh fruits and vegetables to consumers by assisting three to four viable private-sector producer groups in the marketing of their fruits and vegetables.

#### **2. Project Purpose**

The purpose of this project is to improve the efficiency of private sector marketing systems within the project-targeted areas through the development and application of marketing system models employing replicable interventions.

#### **3. Project Outputs**

The outputs of the proposed project are:

- a) Improved crop handling and storage, and food-processing techniques introduced and tested.

To achieve this output, storage facilities will be constructed; appropriate improved techniques in post-harvest crop handling, food storage, and traditional food processing methods will be tested and implemented; medium-scale processing

## **Fruit & Vegetable Marketing Pilot Project - Chad**

facilities and opportunities will be investigated; and links with credit sources will be established.

### **b) Improved extension services available to groupements.**

One way to improve marketing systems is to increase the knowledge base, resources, and overall capacity of field extension agents. To achieve this output, the project proposes to use a hands-on, practical approach in training the trainers, extension agents, counterparts, and groupement members through the use of field days and study tours. It is estimated that two thousand farmers and their families, thirty sellers in N'Djamena, fifteen extension agents, and four counterparts will be trained during the two and one-half years of project implementation.

### **c) Transport systems identified, tested, and evaluated.**

This output will be accomplished through the establishment of a transport information network. Transport options for moving produce from field to storage and from storage to N'Djamena will be tested and retested through the use of trial shipments; improvements in traditional systems and new transport systems will be tested; links with credit sources for intermediate transport, that is from field to storage, will be established.

### **d) Market selling systems identified, tested, and evaluated.**

Under this output, an assessment will be made of sustainable market improvements. The feasibility of using cool storage in Karal and N'Djamena will be explored. Contracted deliveries to selected institutions will be made.

This output will also investigate the feasibility of forming a women's sales group (groupement de vendeuse) at the central market in N'Djamena. That groupement will enjoy a privileged relationship with the producers and a contractual sales option with a wholesaler, as well as using producers and sellers.

### **e) Trial shipments organized, tested, and evaluated.**

The undertaking of trial shipments, discussed in more detail in the Marketing Logistics section below, will lead to a better understanding of the producer-seller relationship as well as identifying and assessing the constraints and potential for establishment of more efficient transport systems. All knowledge gained from trial shipments will be incorporated into curriculum development for training groupement members.

### **f) Marketing monitoring and intelligence infrastructure and database organized and functioning.**

The marketing logistics and monitoring officers will be responsible for gathering and analyzing statistical market data on a regular basis for use in planning and forecasting market trends and behavior. A monthly bulletin with information on the fruit and vegetable market will be published.

### **C. Project Activity Components**

The major activities of the project can be categorized under three components: product technology, marketing logistics, and marketing intelligence which will be managed out of three functional units. The staffing, roles, and major operations of those units is described below.

#### **1. Product Technology**

The project will establish a Product Technology Unit (PTU) which will be staffed by a long-term Product Engineer in Karal. S/he will work closely with the ONDR and SECADEV agents based in the area and be assisted by short-term consultants from VOCA or the FED. The PTU will devise, test, evaluate, and adapt solutions to produce-handling problems.

Specifically, the PTU will handle harvesting and handling of produce, conditioning, grading, quality control, packing, food storage and conservation, and food processing and product transformation.

Improved handling techniques, such as cutting from vines instead of ripping, placing produce in baskets instead of throwing it, avoiding contact with the soil, and sorting to remove infected or diseased fruit, will be taught to farmers in order to reduce bruises, cuts, and contamination of the produce. The local manufacture of harvesting flats for field packing and transport will be investigated.

Vegetables will be washed to remove field heat in order to prolong their shelf-life. Produce will be sorted by variety, size, and color, as an indicator of ripeness, on grading tables. A central collection shed will be built and used for the preparation of produce for shipment to N'Djamena.

The project will introduce and test locally-manufactured standardized, product-specific packaging containers of various designs and specifications in order to better protect the produce, prolong its shelf-life, and reduce its cost.

Low-cost cooling systems will be tested by the project with an aim to improving storage duration, and to provide greater flexibility for load assembly and shipment.

Traditional processing methods will be improved through the introduction of drying slabs and trays. More sophisticated processing technologies currently being introduced will be analyzed by the PTU with an aim to their adoption by the project.

#### **2. Marketing Logistics**

A Marketing Logistics Unit (MLU) will be created under the project to coordinate interaction between the producers, transporters, and the market. This unit will be headed up by the Marketing Advisor/Chief of Party who will be supported by two Logistics Officers, one based in Karal and one in N'Djamena. Radio communication will be employed between all project sites and N'Djamena.

## **Fruit & Vegetable Marketing Pilot Project - Chad**

Guidance to farmers and coordination of production inputs and methods, such as use of preferred varieties and harvesting and post-harvest practices, will be provided by the MLU. A more even distribution of fruits and vegetables throughout the year will be sought. The communications and logistics network will be carefully coordinated to allow the groupements to take advantage of price variations in the marketplace.

Coordination between producers and transporters will ensure availability of transport and the timely dispatch of produce to market. Several transport options will be investigated.

Farmers are often forced to pay outrageous prices for transporting produce the short distance from the field to a storage facility. Options will be thoroughly analyzed to find ways to obtain such transport at cheaper prices.

Through the MLU, the project will identify reliable carriers, negotiate transport contracts, and maintain radio communication with transporters. The negotiation of agreements with truck owners, transporters, merchants, and PAM/OPS truck fleets will be investigated and tested during implementation of trial shipments.

The possibility of utilizing producer-owned transport for groupements located close to N'Djamena with credit through VITA will also be investigated by the project.

In the area of sales, various options will be tested by the MLU. These will include:

- the creation of a women's sales association which would maintain a privileged relationship with the producers. The incentive to commit to such a relationship would be the sure, predictable, and precisely-timed supply of quality produce at competitive, pre-established prices, and the ability to bypass middlemen.
- the utilization of wholesalers to negotiate pre-arranged deliveries of large shipments.
- producer-owned stands that would permit groupements situated close to N'Djamena to use family members as salespersons.
- contracting deliveries where the project will introduce the groupement members to the institutions and train them to assess produce specifications and quantities required, provide samples and prices, and assemble orders.

Fifteen trial shipments will be undertaken by the project and groupement members, to begin at the end of the first year of project operation. These shipments will test project hypotheses and techniques including containers and packing techniques, carriers and transport arrangements, market segments and sales options, and the efficiency of the communications and information network. These trials will be financed by the project. Proceeds derived from trial shipments will be placed in a fund to finance future trial shipments or other costs associated with developing improved marketing mechanisms.

## **Fruit & Vegetable Marketing Pilot Project - Chad**

### **3. Marketing Intelligence**

To coordinate the Marketing Intelligence component of the project, a Marketing Intelligence Unit (MIU), based in N'Djamena, will be established. It will be staffed by the Market Intelligence Officer, to be seconded tentatively by one of the following GOC Ministries: Ministry of Commerce; Ministry of Planning and Cooperation; or the Interministerial Office for Studies and Programming and two full-time surveyors who will gather and disseminate data on production trends, price variations, volume and pattern of shipment arrivals, market behavior, consumer preferences and purchasing habits and export opportunities. This information will provide the MLU and PTU with the means to formulate effective marketing strategies and guidelines.

The MIU will monitor production trends through the analysis of secondary data collected from other projects and agencies. Indicators to be monitored will include area under cultivation, type of crops planted, expected output, and the volume and timing of deliveries to market. This database, updated continuously, will enable the project to better schedule the planting of specific crops and deliveries by groupements.

The MIU will also gather primary data on price variations of relevant commodities, their arrival time in the market, and will monitor the market's reactions to these deliveries. This information will permit the project to better coordinate transport and delivery schedules. The MIU will undertake periodic surveys to ascertain consumer preferences and purchasing power in order to better coordinate production with consumption.

The project will investigate export opportunities through the use of short-term consultants who will review export requirements of the GOC, import-market requirements, relevant contacts, commodity outlook, and the availability of shipping and its cost. Any specialized studies identified by the project will be undertaken by short-term consultants from either VOCA, FED or a third party.

#### **D. PVO Inputs to be Financed by AID**

See budget notes in the Detailed Cost Estimate with Budget Notes in Annex K.

#### **E. PVO-Financed Inputs**

ACDI will provide the services of short-term consultants, valued at \$57,200, through the Farmer-to-Farmer Program managed by Volunteers in Overseas Cooperative Assistance (VOCA), a sister organization.

## Fruit & Vegetable Marketing Pilot Project - Chad

### F. Inputs Financed by Third-Parties

ACDI recognizes that a critical element in developing sustainable marketing infrastructures will be counterpart resources provided by the beneficiaries and the GOC. The willingness and ability of the groupements to commit their own, albeit limited, resources to the project will be an important measure of their commitment to its goals. The following describes the source and value of other inputs ACDI will bring to bear on the project. A detailed breakdown of these inputs is included in the Cost Estimates and Financial Plan section.

#### GOC-Provided Local Salaries & Benefits:

The Logistics, Monitoring, and Marketing Officers are tentatively to be seconded employees of the Ministries of Agriculture and Commerce. The GOC will continue to pay their normal salaries while they are working with the project. Estimations of their annual salaries are: Logistics Officers-\$7,000 per year times two persons; Monitoring Officer-\$8,000 per year; and Marketing Officer-\$9,000 per year. It is expected that these officers will be trained and experienced. Benefits are included in the foregoing estimates which are budgeted for the full two and one-half years of the project. This results in a contribution of \$77,500.

The GOC will also contribute the services of a field agent from ONDR in Karal, and another from ONADEH in Dagarmassa. Their costs have been estimated at: ONDR agent at \$5,400 per year for two and one-half years; and the ONADEH agent at \$4,600 for one and one-half years. All estimates include salary and benefits, and total \$20,400 for this input. The total of the GOC-provided salaries and benefits is estimated at \$97,900 for the life of the project.

#### Groupements:

Meals: The groupement members in the Karal area will provide meals to project employees and staff during the demonstrations and field days. This has been estimated at \$1.00 per meal for seventy-five people for thirty-two field days during years 1 and 2, and sixteen field days during year 3. The total input by the groupements for meals is estimated at \$6,000.

Labor for Construction: The groupement members have agreed to donate their labor in the construction of the conditioning shed and storage facilities in Karal to be financed by FED. The value of that labor has been estimated at \$4.00 per day for fifteen people for sixty days for each building for a total for two buildings of \$7,200. The same rate has been applied to calculations for the construction of similar buildings in the Dagarmassa area during year 2. This results in an estimated contribution of labor for construction of these facilities of \$14,400.

For the construction of offices and guest houses in Karal and Dagarmassa, the groupements have agreed to provide labor at \$4.00 per day for twenty people for ninety days during year 1 for Karal, \$7,200, and the same amounts in year 2 for Dagarmassa, resulting in a labor contribution for offices and guest houses valued at \$14,400.

## Fruit & Vegetable Marketing Pilot Project - Chad

Labor for Trial Shipments: The in-kind labor contribution of the groupement members in harvesting, processing, packing, and organizing trial shipments is estimated at \$4.00 per day for sixty people for seven days times fifteen shipments, five in year 1, seven in year 2, and three in year 3. The total cost of trial shipments is estimated at \$25,200.

Housing for Peace Corps Volunteer: The villagers of N'Gouma/Dagarmassa will provide housing for the Volunteer during the second year of the project. This is estimated to have a rental cost of 25,000CFA/month or \$80/month for 12 months. The labor estimated to construct this house is estimated at \$4.00 per day for fifteen people for thirty days for a total of \$1,800. The total value of this input is \$2,760. The grand total of the value of inputs to be contributed by the groupements for meals and labor is estimated at \$62,760.

### FED:

The FED has tentatively committed to sponsoring three short-term consultants, one in year 1 and two in year 2. Their daily rate has been budgeted at \$275 per day for 26 days per month plus per diem at \$115 per day for 30 days per month. In addition, \$3,200 per round-trip ticket from Europe to Chad has been budgeted. Note: this daily rate is conservative as consultants to be recruited are leaders in their field and generally command higher rates. The cost of this contribution is \$41,400.

FED has also agreed to finance the construction of a 120 sq. meter conditioning shed and 50 sq. meter storage room in Karal. Costs of construction of the conditioning shed have been estimated at \$20.00 per sq. meter and \$60.00 per sq. meter for the storage room, a total of \$5,400. The total estimated contribution by the FED is \$46,800.

### UNDP/SNV:

The UNDP/SNV project will provide training materials and teaching aids such as blackboards, notebooks, and pens, and will permit the project to use audiovisual equipment all valued at \$2,000.

SECADEV: this organization will contribute five extension agents in the Karal area. Their estimated annual salary is \$3,800 per year for a total of \$47,500.

The estimated contributions to be made to the project by non-USAID sources, by group, including the amount to be contributed by ACDI through Farmer-to-Farmer Volunteers, is as follows:

FED	- \$ 46,800
UNDP/SNV	- \$ 2,000
Groupements	- \$ 62,760
GOC	- \$ 97,900
SECADEV	- \$ 47,500
ACDI/FtF	- \$ 57,200
<b>Grand Total:</b>	<b><u>\$314,160</u></b>

## Fruit & Vegetable Marketing Pilot Project - Chad

### III. COST ESTIMATES AND FINANCIAL PLAN

#### A. Summary Cost Estimate

	USAID	ACDI	OTHER THIRD PARTIES	TOTAL
CONSTRUCTION	\$30,240	0	36,960	67,200
PROCUREMENT	\$224,103	0	0	224,103
TRIAL SHIPMENTS	\$16,276	0	25,200	41,476
LOCAL SALARIES & BENEFITS	\$189,927	0	145,400	335,327
TRAINING	\$0	0	8000	8000
LT ADVISORS	\$849,354	0	0	849,354
ST CONSULTANTS	\$74,688	57,200	41,400	173,288
EVALUATION	\$49,466	0	0	49,466
OTHER DIRECT COSTS	\$313,718	0	0	313,718
SUBTOTAL	\$1,747,772	57,200	256,960	2,061,932
ACDI OVERHEAD	\$681,631	0	0	681,631
TOTAL PROJECT COST	\$2,429,403	57,200	256,960	\$2,743,563

#### B. Financial Plan

The ACDI headquarters office in Washington, D.C. will provide normal backstopping to the project, and will assure that all reports of a financial or other nature are submitted to USAID/C on a regular basis and in the format prescribed in the Cooperative Agreement.

ACDI proposes that project funds be channelled through ACDI's Federal Reserve Letter of Credit (FRLC) No. 72001395. Based on cash projections conforming to project planning prepared in the field, funds will be transferred to the N'Djamena field office from ACDI headquarters via wire transfer. The project will convert those funds and will open a bank account or accounts for the deposit and disbursement of converted local currency at a Chadian bank in N'Djamena. As there are no banking facilities in Karal, all funds required for that operation will be delivered in cash. ACDI will take all precautions necessary for the prudent handling of that cash. Security items, in the form of safes and guards for the N'Djamena and Karal offices, has been included in the project budget.

Disbursement of funds will conform to the project budget and will follow procedures already operating for ACDI's other ongoing projects in Africa and elsewhere. Accounting is supervised by the ACDI Controller and his staff of accountants, utilizing a computerized accounting system. Monthly reports of receipts and disbursements will be forwarded from the field to ACDI headquarters where they will be analyzed first by the Vice-President/Africa Region and his assistant. Disbursements will be coded in accordance with the project budget. Monthly reports and analyses of project expenditures will be produced by ACDI/W and forwarded to the field. Those reports will show the expenditures for the month, year-to-date, and

Fruit & Vegetable Marketing Pilot Project - Chad

life-of-project, and the relationship of those expenditures to monthly and annual budget projections.

**C. Cost Estimates of Other Inputs**

	ACDI			OTHER THIRD PARTIES			TOTAL
	YR 1	YR 2	YR 3	YR 1	YR 2	YR 3	
<b>Consultants</b>	<b>\$21,450</b>	<b>21,450</b>	<b>14,300</b>	<b>\$13,800</b>	<b>27,600</b>		<b>\$98,600</b>
Fees	21,450	21,450	14,300	7,150	14,300		78,650
Travel				3,200	6,400		9,600
Per Diem				3,450	6,900		10,350
<b>Training</b>				<b>\$3,800</b>	<b>3,000</b>	<b>1,200</b>	<b>\$8,000</b>
Demonstrations/ Field Days				2,400	2,400	1,200	6,000
Materials				1,400	600		2,000
<b>Other Direct Costs</b>				<b>\$83,600</b>	<b>89,160</b>	<b>34,800</b>	<b>\$207,560</b>
Construction Labor				14,400	17,160		31,560
Construction				5,400			5,400
Local Salaries and Benefits				55,400	60,000	30,000	145,400
Trial Shipments				8,400	12,000	4,800	25,200
Yearly Third Party Contributions	21,450	21,450	14,300	101,200	119,160	36,000	314,160
<b>Total Third Party Contributions</b>	<b>\$57,200</b>			<b>\$256,960</b>			<b>\$314,160</b>
<b>Total Third Party Percentage</b>	<b>2.0%</b>			<b>11.0%</b>			<b>13.0%</b>

#### **IV. IMPLEMENTATION PLAN**

##### **A. Implementation Responsibilities**

###### **1. ACDI**

The proposed project will be implemented by ACDI under a cooperative agreement with USAID/C, which will be negotiated and signed at AID/W. ACDI will establish a field headquarters office in N'Djamena and sub-offices in Karai and Dagarmassa. Backstopping will be performed at ACDI's headquarters office in Washington, D.C. by the Vice President and Project Coordinator/Africa Region, his assistant, with the support of senior management, and accounting and clerical staffs.

The only subcontract ACDI intends to make is to VOCA for the Farmer-to-Farmer short-term consultants. The only other situation which would require subcontracting would be a major and technically complex procurement effort, which is not anticipated at this time. In the event such an effort were required, ACDI would subcontract with a procurement service agency (PSA). Any such action to this effect would be cleared with USAID/C in advance.

As part of the pre-implementation phase of the project, a representative from ACDI/W will spend approximately two weeks in Chad to initiate pre-implementation activities, the most important of which will be the negotiation and signing of the operating and project agreements with the GOC.

Prior to the pre-implementation phase mission, ACDI/W will initiate recruiting of the long-term expatriate staff.

Initial implementation, carried out by the long-term advisors, will focus on the following activities:

- final determination of GOC counterpart agencies and agents to be seconded to the project;
- development of construction plans for office and guest houses in Karai; identification of sources of construction materials; identification of the building site and approval of the site by the village chief; coordination of construction logistics with groupements;
- identification and delineation of roles and responsibilities of each participating agency, i.e. GOC, groupements, and private agencies;
- identification of office quarters;
- reestablishment of contacts made during design mission to appraise them of project status and reaffirm how they might best collaborate with the project;
- obtaining copies of recently completed fruit and vegetable study undertaken by BIEP and USAID/C (Yacoub);

## **Fruit & Vegetable Marketing Pilot Project - Chad**

- meeting with the Ministry of Social Affairs to define the potential and methods for working with women's groups;

Simultaneously with the foregoing, the project will install project offices in N'Djamena and Karal. This will consist of:

- constructing an office in Karal and finalizing a rental agreement in N'Djamena;
- purchasing office equipment and furnishings;
- establishing scopes of work for project counterparts;
- hiring local staff;
- making initial contacts with outside organizations, government agencies, and individuals involved in the production and sale of fruits and vegetables.

The Monitoring and Evaluation consultant will be scheduled to arrive at this time to assist the Monitoring Officer in the establishment of the project monitoring system.

Because the long-term expatriate advisors will not arrive in time to take advantage of the full 1990 fruit and vegetable production season (December-March), the primary emphasis of this pre-implementation phase will be on office installation, data collection, and laying the groundwork for future project activities. This phase is expected to take approximately six months to complete.

Full project implementation will begin, therefore, approximately six months after arrival of the long-term advisors, tentatively scheduled for July, 1990. At this time, the Product Engineer will begin field activities with the extension agents and groupements. The pre-implementation phase will have focussed on the orientation of the extension agents and groupements, therefore, the PTU will immediately begin extension and groupement training in improved post-harvest techniques. The PTU will also begin working at this time with the Dutch volunteers (SNV) in the modification and development of technical training materials and curricula.

Concurrently, the MLU will begin investigation of transport and sales options. Needs expressed by transporters and sellers as they relate to commodity, i.e. quantity, quality, and packing requirements, will be transmitted by the MLU to the PTU so that produce in demand in the market is properly assembled and transported under the trial shipments sub-activity. At this time, the MLU will also investigate and test different marketing and storage options.

The MLU will utilize data from the PTU concerning design, construction, and acceptability of storage structures to be constructed in Karal in determining the feasibility of their replication in N'Djamena.

The other project implementation unit office, the MIU, will set up its database system. The MIS consultant will be brought in to assist the Marketing Intelligence Officer in that task. The marketing and production monitoring activities will be ongoing and will begin providing the other project implementation units a picture of

## **Fruit & Vegetable Marketing Pilot Project - Chad**

fruit and vegetable production and marketing in Chad. The surveyors will begin baseline data collection immediately, which the MI officer will analyze and use to provide pertinent feedback to the MLU and PTU.

After the first year of operations, the MIU will utilize short-term consultants from VOCA and other sources for more comprehensive studies such as investigating possibilities for cool storage and export of fruit and vegetables. It will be the responsibility of the MIU to organize and coordinate these studies. The fruit and vegetable bulletin will be published at this time, once sufficient research on potential content has been completed.

Simultaneously to activity start-up by the three project implementation units, trial shipments will be initiated. Five such shipments are planned for the first year, seven in year 2, and three in year 3, for a total of fifteen. Upon completion, each shipment will be analyzed by the MLU, and feedback on product technology, marketing logistics, and marketing information systems will be provided. These analyses would then be fed to all project units so that they can modify activity plans accordingly.

Based on the results of the trial shipments, it is expected that the groupements will continue making such shipments on a purely commercial basis at their own expense. The role of the long-term consultants will at this point become strictly advisory.

The Organizational Charts (see section C) outline both the donor agencies, project units and implementing agencies participating in the project and in what capacity they interact with project activities and the chain of command and relationships between ACDI staff, host country counterparts and extension agents. The Implementation Schedule (refer to section D) indicates the timeframe and manner in which the project will be monitored and evaluated.

### **2. Government of Chad**

It is felt that project continuity will be enhanced if the GOC provides the key staff persons responsible for project implementation. The GOC will tentatively be responsible, therefore, for seconding the Marketing Logistics, Marketing Intelligence, and Monitoring Officers. One extension agent, tentatively to come from ONADEH, will work with a Peace Corps Volunteer in the Dagarmassa area in crop handling and storage; another extension agent, from ONDR in Guitte, will work with the Product Technologist. The roles of these GOC extension agents will be generally to promote villager participation and facilitate the performance of project activities.

At the time external financing for the project is completed, the only project implementation unit requiring support through a government agency will be the Marketing Intelligence Unit. Product technology will have been assimilated by the groupements and will have been institutionalized in SECADEV and ONDR, which are permanent fixtures on the agricultural development scene in Chad. Marketing logistics will be taken over by the private sector, and regular radio communication will facilitate transactions between producers, transporters, and sellers. The Marketing Intelligence Officer will continue his/her functions within the assigned ministry and will continue to provide feedback through the radio program and monthly bulletin.

## **Fruit & Vegetable Marketing Pilot Project - Chad**

The GOC will assure delivery of the necessary exonerations and documentation required for the duty-free clearing of purchases of project vehicles and equipment.

### **B. Collaboration with Other Donors and NGO's**

#### **1. FED**

The 6e FED project is launching a major rural development project that will impact on the groupements in the Karal area. They are currently finalizing plans to build a road from Mani to Karal and are planning construction of several other village feeder roads. Through the FED, funding is available for construction of storage and collection centers, as well as financing for a revolving fund to provide credit to participating groupement members of the purchase of agricultural inputs. FED has also agreed to contribute funds for short-term consultancies in the areas of fruit and vegetable processing and export. It is also planning a radio program on prices and production figures of agricultural commodities. This program presents an area for potential collaboration through the market information bulletin the project proposes to publish.

Requests for financing from FED must be submitted by the groupements and must contain evidence that the proposed project is appropriate to the needs of the members and that it is financially and technically sustainable. The FED was highly supportive of the proposed project and is willing to collaborate in project activities.

#### **2. UNDP**

Possibilities for collaboration with UNDP exist in two areas. First, UNDP has expressed a strong interest in loading empty food-aid trucks, returning from deliveries in the North, with groupement produce shipments going from Karal to N'Djamena. Transport costs for the Karal groupements would be dramatically reduced (see Annexes F and I for detailed figures) were such an arrangement worked out.

Secondly, as part of the UNDP/BIT project, Dutch volunteers stationed in Karal are teaching business management and cooperative organization and development to the groupements there. ACIDI will work with these volunteers in expanding the current curriculum to include topics germane to the project.

#### **3. SECADEV**

ACDI will be working closely with SECADEV agents in the Karal area, building on their already well-established extension system, in carrying out training and demonstration work with the farmers and groupements. This will require revised job descriptions designed to encompass the new expanded roles and responsibilities of those agents.

The SECADEV agents will participate in training-of-trainers' workshops to be put on by the Product Engineer in the areas of appropriate post-harvest handling, storage, and food processing. Once trained, they will organize demonstrations, designed to reach approximately twenty to thirty farmers, of the new techniques. The Product

## **Fruit & Vegetable Marketing Pilot Project - Chad**

Engineer will assist at these demonstrations to insure that techniques are being taught properly and that farmers understand the principles behind them. The Product Engineer will also be responsible for assigning responsibilities to the agents for implementation of trial shipments.

### **4. VITA**

VITA has agreed to consider the provision of credit to groupement members for equipment or construction, such as transport or construction of improved stands at the market, providing the groupements can meet the credit eligibility criteria of VITA's program. VITA will provide monitoring of the loan.

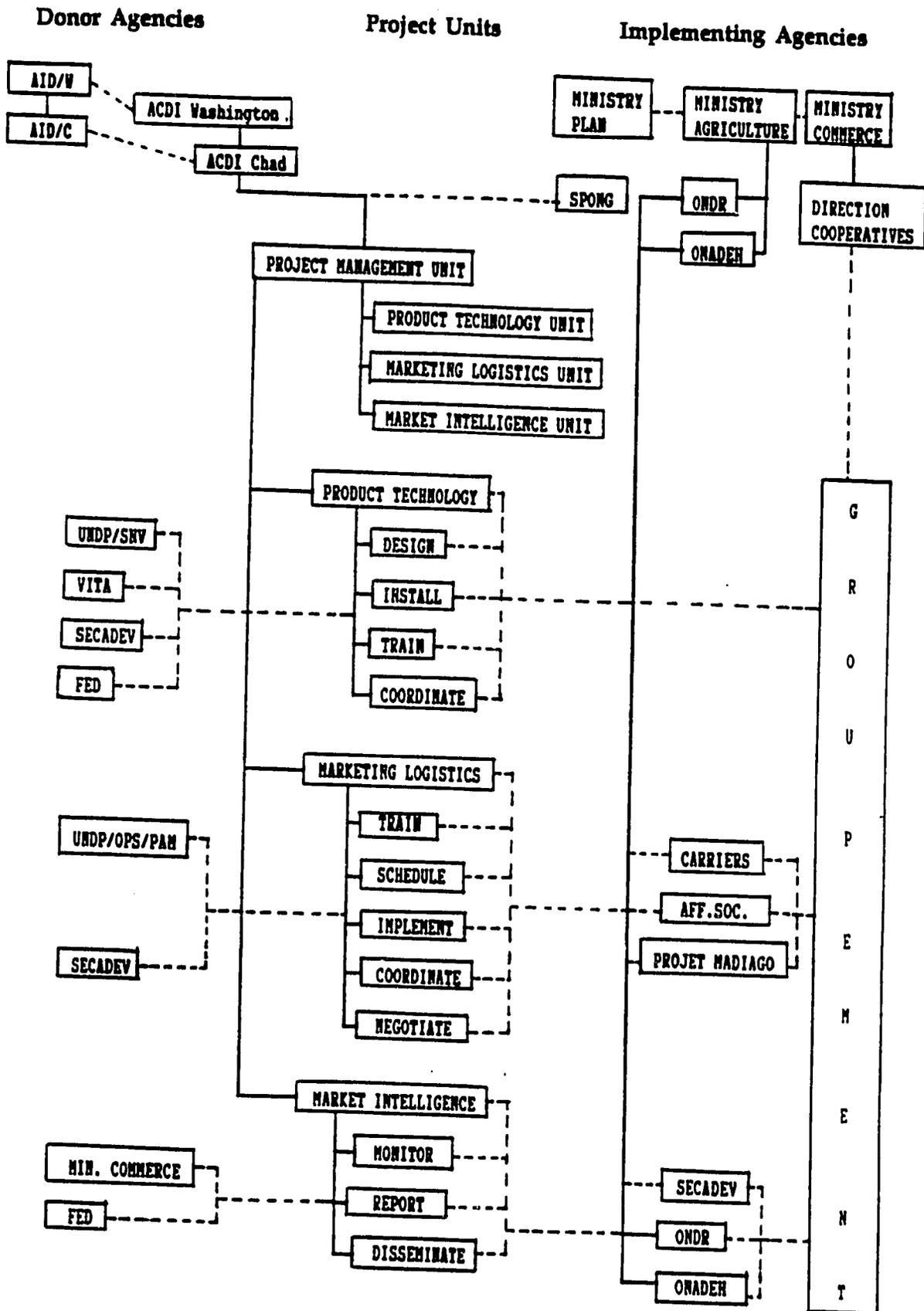
### **C. Procurement Plan**

The PVO-DIP has a source-and-origin 636 (i) waiver permitting the procurement of vehicles and spare parts manufactured outside U.S. The project plans on buying three four-wheel drive vehicles of either Japanese or European make.

All in-country procurement will fall under the purview of the Chief of Party and his staff. Procurement procedures will be established whereby local procurement over a certain amount will require approval of ACDI/W headquarters. Even minimal procurement, however, will be required to have a basis in budget line items. Procurement by headquarters will be requested through a simple form and will be performed by the head of the ACDI headquarters Department of Administration after approval by the Vice President/Africa Region.

# Fruit & Vegetable Marketing Pilot Project - Chad

## D. Organizational Chart





BEST AVAILABLE COPY

Office equipment	FE	.	----	----	.
Electronic equipment	FE	.	----	----	.
Technical equipment	FE	.	----	----	.
Monitoring & Eval. Consul.	NE	.	----		
Construction/Installation		.			
Office/Exam-rooms		.			
Karal	FE	.	----		
Bogorwasa	NO	.		-----	
Marketing facilities		.			
Karal	JN	.		-----	-----
Bogorwasa	DE	.			-----
H'Djonna	DE	.			-----
<b>IMPLEMENTATION</b>					
Product Technology		.			
Curriculum Development	NE	.	-----	-----	
Extension Agents Try.	NE	.	-----	-----	
Groupments Training	AP	.	-----	-----	
Testing		.			
Crop handling	AP	.	-----	-----	
Conditioning	AP	.	-----	-----	
Storage	NE	.	-----	-----	
Drying	NY	.	-----	-----	
Demonstrations	AP	.	-----	-----	
Storage/Cond. Consultant	NY	.	-----	-----	
Improved Stor. Construc.	JN	.	-----	-----	
Groupment Operations	AP	.	-----	-----	
Field Trips	AP	.	-----	-----	
Processing Consultant	SE	.	-----	-----	
Unallocated Consultant		.	-----	-----	
Market Logistics		.			
Transport		.			
Study/test Alternatives		.			
Contract local carriers	NY	.	-----	-----	
Contract H'Dj carriers	NY	.	-----	-----	
Contract OPS/PM	JN	.	-----	-----	
Producer owned carrier	DE	.	-----	-----	
Unallocated Consultant		.	-----	-----	
Sales		.			
Train Home Groupments	NY	.	-----	-----	
Test Alternatives		.			
Sellers Groupment	JN	.	-----	-----	
Contract Wholesalers	JN	.	-----	-----	
Producers' Mkt Stands	DE	.	-----	-----	
Contract Institutions	DE	.	-----	-----	
Test Market Storage	FE	.	-----	-----	
Unallocated Consultant		.	-----	-----	
Trial Shipments	JN	.	-----	-----	

26C.

MIS/Database Consultant AP  
 Monitor Production Trends NY  
 Monitor Market Behavior NY  
 Investigate Export Support JA  
 Export Consultant BR  
 Publish Bulletin JB  
 Specialized Surveys

Crypts. Commercial Shipments JB

**MONITORING AND EVALUATION**

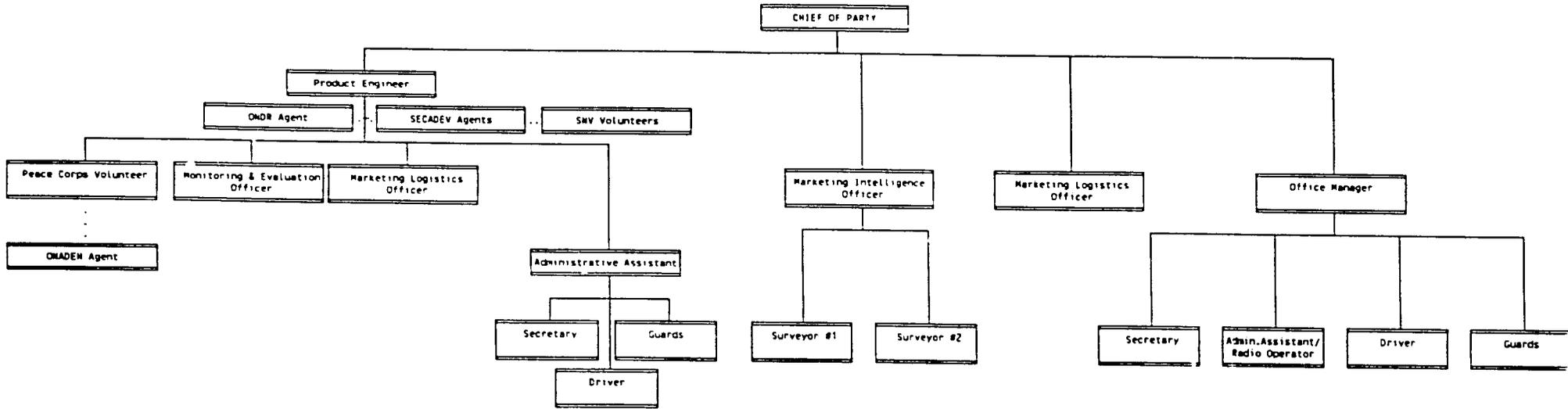
Monthly field reports DE  
 Consul. final reports NY  
 Quarterly rpts to USAID BR  
 ACBI supervisory visits DE  
 Project evaluation AP  
 Final project report JU

BEST AVAILABLE COPY

268

ACDI PROJECT ORGANIZATIONAL CHART

Location: N'Djamena



REST AVAILABLE COPY

REST AVAILABLE COPY

26 21

## **Fruit & Vegetable Marketing Pilot Project - Chad**

### **V. MONITORING PLAN**

#### **A. ACDI Project Management**

ACDI will establish three project offices in Chad: a central office in N'Djamena, and sub-offices in Karal and Dagarmassa. The N'Djamena office will be staffed by the Marketing Specialist/Chief of Party, Monitoring and Logistics Officers, and a support staff consisting of an office manager, secretary, administrative assistant/radio operator, driver, and guardians. The N'Djamena office will be responsible for liaison with the field technicians, short-term consultants and Farmer-to-Farmer volunteers, USAID, the Chadian government, other donors, and ACDI headquarters in Washington. Customs clearance, banking, financial and narrative reporting, procurement, and logistics will all be the responsibilities of the N'Djamena office. Specific information on the roles of those officers and staff is provided in Annex C.

Monitoring is considered an integral part of successful project management, providing the data required for decision-making by the PMU. The Monitoring Officer will be assisted by a short-term Monitoring and Evaluation consultant in setting-up the monitoring system. This will entail selection of the indicators to be observed; identification of parameters to be monitored; and formats for data presentation and reports.

During the course of the project, and especially during the start-up phase, the Marketing Advisor/Chief of Staff will devote a major portion of his/her time visiting the field sites to coordinate start-up efforts and establish relations with local staff and groupements. The field offices will be linked with N'Djamena and each other by short-wave radio.

The Chief of Party will be required to produce annual operational and training plans, and quarterly work plans and progress reports. Those work plans will list objectives for the upcoming quarter, review achievement of the previous quarter's goals and objectives, cite problems solved, and preview obstacles anticipated. The quarterly plans and reports will be forwarded to USAID/C and ACDI/W headquarters where they will be scrutinized by the Vice-President/Africa Region and his assistant. The Chief of Party will also be responsible for submitting required reports to the GOC in a timely manner.

The Vice-President/Africa Region and the Project Coordinator/Africa Region will provide overall project management supervision. The backstopping activities for this project include but are not limited to: 1) coordination and monitoring of all activities relating to long-term advisors, 2) orientation, logistical support, and recruitment of short-term consultants; 3) establishing and coordinating internal reporting procedures; 4) assuring systematic and timely information-sharing to the field; 5) monitoring project expenditures and program outputs; 6) maintaining continuous contact with the field office in N'Djamena; 7) assuring that all program reports are submitted in a timely manner to USAID/Chad; and 8) maintaining contact with AID/W as required.

## **Fruit & Vegetable Marketing Pilot Project - Chad**

In addition, ACDI will schedule a minimum of one supervisory trip per year to N'Djamena by the Vice-President/Africa Region or the Project Coordinator/Africa Region.

### **B. AID Liaison**

The Chief of Party will keep USAID/Chad informed of project progress and problems, and of any proposed changes in program activities. S/he will also be responsible for timely and comprehensive reporting to USAID and the GOC.

### **C. GOC Project Management**

The project will be implemented in close collaboration with various GOC agencies. The design team contacted the Ministries of Plan, Agriculture, and Commerce to explain the project concept and solicit their ideas on project organization and implementation. An agent from ONADEH accompanied the team on a tour of the irrigated perimeters between N'Djamena and Guelendeng. He was very knowledgeable on the area and gave valuable input into the project design. On the design team's trip to Karal, both the SECADEV promoters and the ONDR agent in Guitte were very interested in the possibilities for a project of this sort and offered excellent ideas and suggestions which were incorporated into the project design.

As the project idea took shape, the design team met again with representatives of ONDR and the Ministries of Plan and Agriculture to review hypotheses and verify that the project complemented overall goals of the GOC as well as those of other donor activities within the same area. The Director of ONDR made several worthwhile suggestions which have been incorporated into the project design.

Successful project management and implementation will require close collaboration between ACDI and government agencies. Therefore, responsibilities and guidelines will be clearly defined during the project pre-implementation phase and strengthened during project start-up.

### **D. Reporting Responsibilities**

Quarterly progress reports, based on reports submitted by field technicians, and financial reports will conform to formats agreeable to USAID/C and ACDI and will be submitted within thirty days of the end of each reporting period. Reports will be sent to the GOC and concerned agencies within 45 days (extra time is needed for translation).

## **VI. SUMMARIES OF ANALYSES**

### **A. Summary of Social Soundness Analysis**

#### **1. Brief Review of the Analysis**

##### **Socio-Cultural Context**

Agriculture produces approximately fifty percent of Chad's GNP, occupies eighty five percent of its work force, and accounts for eighty five per cent of its exports. Accordingly, it is the key to the development of Chad.

During the past fifteen to twenty years, Chad has been buffeted by man-made and natural disasters, including war and drought. These events, although adversely affecting the country and retarding its overall development, have actually served to spur the agricultural development of certain groups living in the Chari-Baguirmi prefecture.

The Chari-Baguirmi prefecture, which contains N'Djamena, the capital, is the second most populated of all the prefectures of Chad. This is the target area for this proposed project, due both to its proximity to the N'Djamena market and its production capacity.

At the time of the 1972 drought, the Massas of Chari-Baguirmi developed irrigated "perimeters" to their fields located along the Chari and Logone rivers. Other groups living in the vicinity of Lake Chad moved closer to the lake as it receded in order to be closer to their fields. In these instances and others, agricultural production was increased, often as a result of agricultural development projects financed by the international donor community. At the same time, the population of N'Djamena doubled placing a sizeable demand on already-insufficient production.

Although farmers are generally interested in increasing their production, they face formidable problems in marketing their produce. Transport is lacking and, when available, is priced beyond the means of the farmers. Roads are virtually non-existent and the transport fleet is inadequate and poorly maintained. Harvesting and post-harvest fruit and vegetable handling, packing, and storage techniques are primitive and result in a tremendous loss from farm to market. Farmers have little or no information on demand and prices. In short, there is a need for improved marketing systems and channels for production in excess of subsistence needs.

The Chari-Baguirmi prefecture contains a mix of tribal groups speaking various languages. Adult literacy is low. All of the groups engage in agriculture, although some possess livestock and engage in minor commerce and trading.

The state is the official owner of all the land in Chad. The village chief or sultan still wields great power and authority and must be consulted on all matters. The approval of the chief is required for the implementation of activities such as that being proposed in this paper.

## **Fruit & Vegetable Marketing Pilot Project - Chad**

Most of the agricultural activity is performed by the males. Hired labor is sometimes employed when the family is incapable of filling field labor requirements. Women of the Hausa ethnic group in Karal are generally required to remain in the home and perform all housekeeping chores and any other tasks that can be done at home. They also engage in the drying of okra and tomatoes for later consumption.

### **Beneficiaries**

Project beneficiaries will include approximately 2000 farmer-members of village production groups which will be organized in marketing groupements for the purposes of this project. The project also plans on working with several women's market groups as well as women's market intermediaries. It is estimated that at least thirty women will directly benefit from the project.

Indirect beneficiaries will include counterparts, extension agents, transporters, craftsmen and micro-entrepreneurs. They will benefit from the increases in marketable produce resulting from improved handling and storage techniques, and the improved marketing channels resulting from better transport arrangements and increased marketing information on production, prices, volume, and demand.

### **Participation**

The major project participating body will be the farmers-members of the village groupements, who will be trained in improved produce-handling, packing, and storage techniques. Other participants include the Ministries of Agriculture, Commerce, and Plan of the government of Chad, extension workers from ONDR, ONADEH, and SECADEV, fruit and vegetable wholesale and retail vendors, and transporters.

## **2. Methodology**

The data in the Social Soundness Analysis was compiled by a two-person project design team sent to Chad by ACDI in June-July, 1989. The team consisted of the ACDI Project Coordinator/Africa Region and an outside consultant. Both team members spoke French fluently.

The team compiled the data through personal interviews with officials and representatives from the aforementioned government and non-government agencies operating in Chad, and with farmers, both groupement and non-groupement members, village chiefs, transporters, fruit and vegetable vendors, and consumers. The team was accompanied by agricultural extension agents of the GOC and actively sought their advice and recommendations and incorporated them into the design of the project. The previous findings and recommendations of the USAID mission in Chad and the other PVO's working under the PVO Development Initiatives Project were strongly considered and utilized in the project design.

In addition, the team conducted a market survey during its brief time in Chad, interviewing over 90 people involved in marketing of fruits and vegetables. The results of this survey have also been incorporated into this proposal.

### 3. Conclusions

The analysis concluded that there were several major issues or constraints to marketing facing the farmers of the project-targeted areas. They are the lack of a transport infrastructure, i.e. trucks and roads; the absence of marketing information to the farmer-producer; and the lack of coordination between the producers and between the producers and the marketplace. The first constraint mentioned above, the lack of a transport infrastructure, is beyond the scope of the project. The latter problems are, however, ameliorable and will be addressed by the project. It was concluded that the project concept and design is feasible due to the following reasons:

- the GOC and other donor agencies and NGO's unanimously recognize the need for a pilot project addressing fruit and vegetable marketing which could be replicated.
- the farmer-members of the groupements list marketing problems as one of their major problems.
- the groups living within the project-targeted area are all agriculturalists.
- interventions and techniques to be introduced are appropriate and within the capacity of the beneficiaries to employ.

#### B. Summary of Economic and Financial Analysis

##### 1. Brief Review of the Analysis

The analysis starts with an introduction and description of the methodology used in the economic and financial analysis. A cost stream incorporating capital, recurrent, and technical assistance costs was constructed to demonstrate the possibilities or implications for future replication of project interventions.

"Soft" benefits to result from the project included: improved management, coordination, organization, and flow of information and were quantified and applied to two models, one for Karal and one for Dagarmassa. Those models were constructed using production information from Annex I, appendix I.2. Low, medium and high assumptions relating to the reduction in marketing-related costs for the farmer due to project interventions were applied using tangible results of the project. These included: broader harvesting season; increased quantity available on market due to loss reduction; reduced transport costs; prolonged shelf life; improved quality; and improved processing techniques.

These quantified figures are applied first to the Karal and Dagarmassa models in relation to how project interventions will affect price per kilogram and then how project interventions will affect total metric tons of production reaching the market, due solely as a result of improved crop handling, logistical and management practices.

## **Fruit & Vegetable Marketing Pilot Project - Chad**

### **2. Methodology**

Data used in the analysis was derived primarily from fragmented secondary sources of questionable accuracy at the Ministry of Commerce Office of Statistics, and in the field where farmers' concepts of measurement, time, and quantity are very subjective. Therefore, the results obtained in the analysis are intended to give a broad indication of trends and should not be taken as scientific or definitive.

The hypotheses using low, medium and high assumptions were derived from production data seen in Appendix I.2 and I.4 of the Technical Analysis.

### **3. Conclusions**

An analysis of the financial results on the farm level depicted in the tables shows that with project interventions the percentage of total loss per farmer will decrease significantly and total revenues will even exceed total losses in the medium and high scenarios.

Also included in this analysis is an economic analysis on the project level, which calculates an internal rate of return for the project by first taking into account total project costs and then, in the second assumption, using just recurrent costs in order to determine likely costs to be incurred if similar marketing activities were to be continued after the project ends.

In addition to the internal rate of return, a brief sensitivity analysis was done in order to determine how sensitive the rate of return is to variations in project costs and benefits. Results show that the rate of return is moderately sensitive to price changes.

Notwithstanding the analysis which shows that despite seemingly large assumptions, a positive rate of return can be generated in the fourth year of the project, ACDI believes that more realistically attainable project goals would be to reduce both the harvest loss and transport costs by twenty-five percent. It is difficult to predict changes in wholesale prices as they are dictated by market forces. ACDI feels, however, that the interventions to be taught and put into practice through the project will result in great savings for the farmers and that, over time, those savings will manifest themselves in an increased volume of produce which will result in lower prices and increased affordability.

## **C. Summary of Technical Analysis**

### **1. Brief Review of the Analysis**

The project does not intend to introduce any complex or foreign technology at the beginning of the project and any technology to be analyzed for possible future use would be carried out by qualified short-term consultants during the life of the project.

Therefore, as a traditional technical analysis was not thought to be applicable in this case, the analysis commences with a review of an extremely wide range of material,

## **Fruit & Vegetable Marketing Pilot Project - Chad**

including climatic conditions prevailing in Chad, the background of fruit and vegetable production there, and the two main geographical areas in which the project intends to operate.

The bulk of the analysis contains detailed information on these areas: Karal, which is located on the southern border of Lake Chad north of N'Djamena, and which depends on the lake to supply flood water for irrigation purposes; and Dagarmassa, which lies to the south of N'Djamena and depends on the Chari and Logone Rivers to irrigate fields, known locally as irrigated "perimeters."

Detailed statistics on production, area under cultivation, types of crops, and estimated yields are presented. The analysis discusses support and extension services available to the farmers in those areas, and the governmental and non-governmental agencies involved in support and extension. A thorough review of constraints to the efficient marketing of fresh fruits and vegetables, broken down by category, is performed.

The analysis next provides an in-depth overview of the three major components or activities which the project will actually undertake: product technology, and marketing logistics and intelligence. Product technology will encompass handling, packing, conditioning, storing, and processing of food; marketing logistics will deal with transport and contractual arrangements between farmers, sellers, and transporters; and marketing intelligence with the collection, analysis, and dissemination of data on the supply and demand of fruits and vegetables.

The analysis closes with a discussion of the training activities, participants, and methods to be employed by the project.

### **2. Methodology**

The ACIDI design team spent a total of one month in Chad. Five days were spent travelling to village sites outside of N'Djamena. A total of fifteen groupements were interviewed and their fields inspected. Meetings with those groupements averaged over two hours each in duration.

In addition, the design team, with the assistance of Chadian representatives from ONDR and SECADEV, designed questionnaires and performed five specific surveys on consumers, transporters, wholesalers, retailers, and institutions.

The information obtained from the methods outlined above was supplemented from personal interviews with representatives of governmental and non-governmental agencies operating in Chad and reports produced by those agencies.

### **3. Conclusions**

The technical analysis concludes that:

- increases in agriculture and food production are key to the development of Chad, and the conditions exist for such increases.

## **Fruit & Vegetable Marketing Pilot Project - Chad**

- the donor-financed projects operating in Chad focus on production and neglect marketing of excess production, and that inefficient marketing systems act as a disincentive to production.
- vegetables and fruits are considered cash crops and depend on the existence of an urban market for volume sales.
- the major constraints to improved marketing are inappropriate handling and storage techniques and facilities; unavailability, unreliability, and high cost of transport; and the absence of information on harvests, volume, and timing by farmers and sellers.
- the aforementioned constraints can be overcome by a project which will design, introduce, and assist in the application of improved methods of handling, storing, packing, and processing of food through product technology, and marketing logistics and intelligence.
- the interventions proposed to be implemented by the project are simple and practical and within the technical and educational parameters of the groups who will participate in the project.

### **D. Summary of Initial Environmental Examination**

An initial environmental examination of the proposed project, carried out by John Gaudet of A.I.D. (AFR/TR/ANR) and Jay Knott of the Office of the General Counsel, resulted in no negative environmental determination on the project.

Although no negative environmental effects are expected, as the project focuses on agricultural marketing and not production, the mid-term and final evaluation teams will make a general determination as to whether any significant environmental degradation, i.e. soil erosion, loss of soil fertility, or deforestation, is taking place in the project-targeted areas (see Annex J).

## **VII. EVALUATION PLAN**

### **A. Implementation Progress Evaluation**

As discussed under Reporting Responsibilities of the Implementation Plan, the Marketing Advisor/Chief of Party will be responsible for submitting quarterly reports to the ACDI/W office for review and feedback. Site visits by ACDI headquarters staff will contribute to ongoing project evaluation.

The economic and technical aspects of the project are considered the most important from the evaluation standpoint. As the proposed project is pilot in nature, and because different marketing combinations will be implemented and tested, it will be important to monitor the approaches and techniques used at each site in order to assess their viability and potential for replication. Economic evaluation will be used to determine what kind of cost/benefit the farmer is realizing from the project.

The sociological impact of the project is also important, and will be evaluated in terms of the degree to which the farmers, villages, and extension agents adopt the project interventions and technologies.

Although negative effects on the environment are not expected, evaluators will seek to determine, in a general way, if significant environmental degradation, such as soil erosion, loss of soil fertility, or deforestation, is taking place in the areas in which the project is operating.

### **B. Formative Evaluations**

A mid-term evaluation will be conducted fifteen months after the start-up of project activities. This evaluation will measure achievement of the project's first year activities, goals, and objectives. Some of the items to be evaluated are:

- Creation of a headquarters office in N'Djamena and field offices in Karal and Dagarmassa;
- Collection of a representative quantity of baseline data on fruit and vegetable markets and prices, transport systems, and production statistics;
- Adoption of new crop scheduling and harvesting techniques.
- Identification of various producer-transport-market systems to be tested at the end of Year 1 and during Years 2 and 3;
- Construction of improved production storage facilities in Karal.

The evaluation will also measure progress towards attaining overall project goals, purpose, and outputs.

The evaluation team will be put together by ACDI and approved by AID and the GOC. The team, along with representatives from USAID/Chad, the GOC and ACDI, will spend three weeks in the field, at the end of which it will present a preliminary

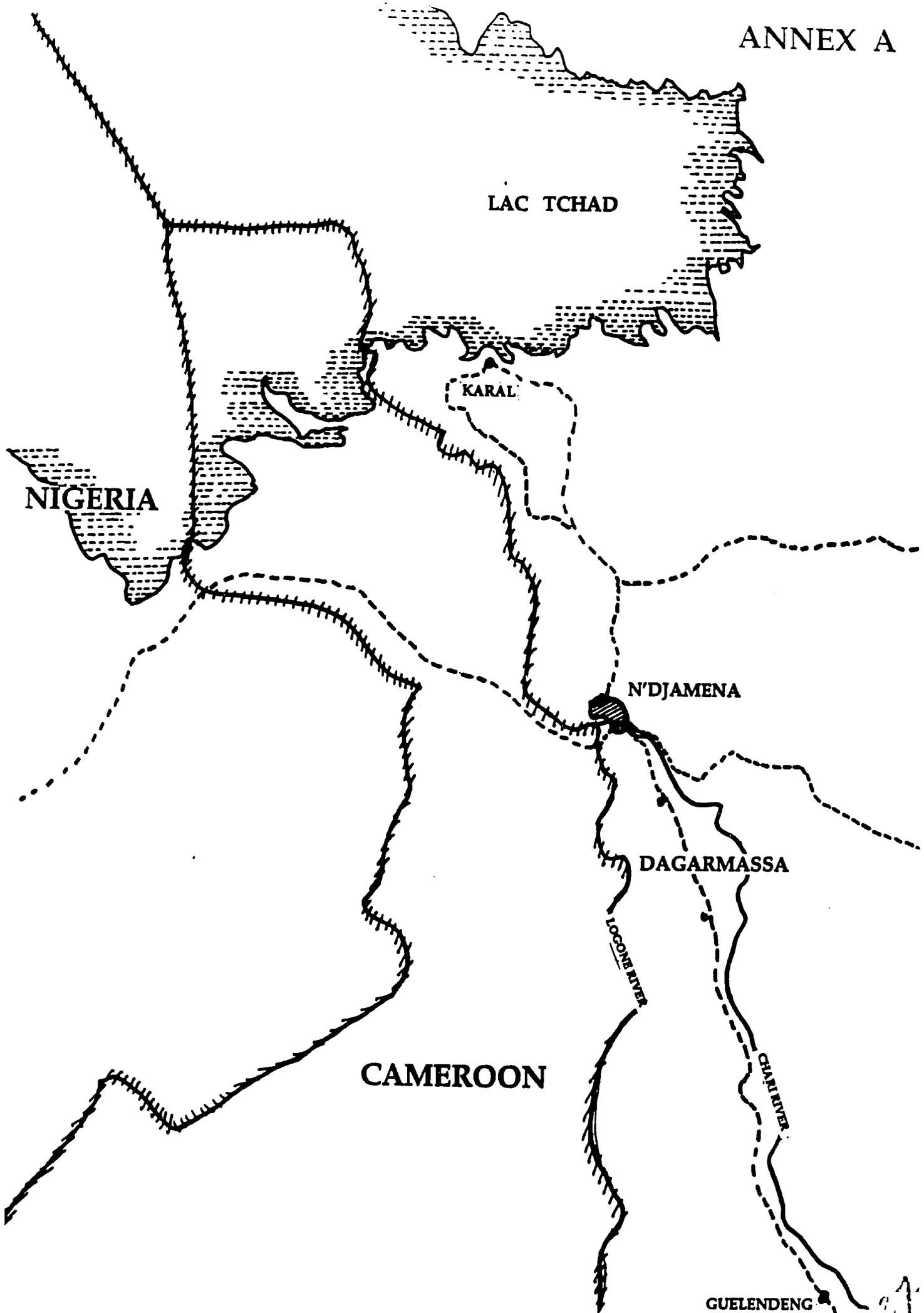
## **Fruit & Vegetable Marketing Pilot Project - Chad**

report of findings with recommendations for improved project implementation. The team will also provide preliminary indications on whether the pilot project should be expanded and extended. A final, comprehensive evaluation report will be submitted to USAID six weeks from the date of submission of the preliminary report.

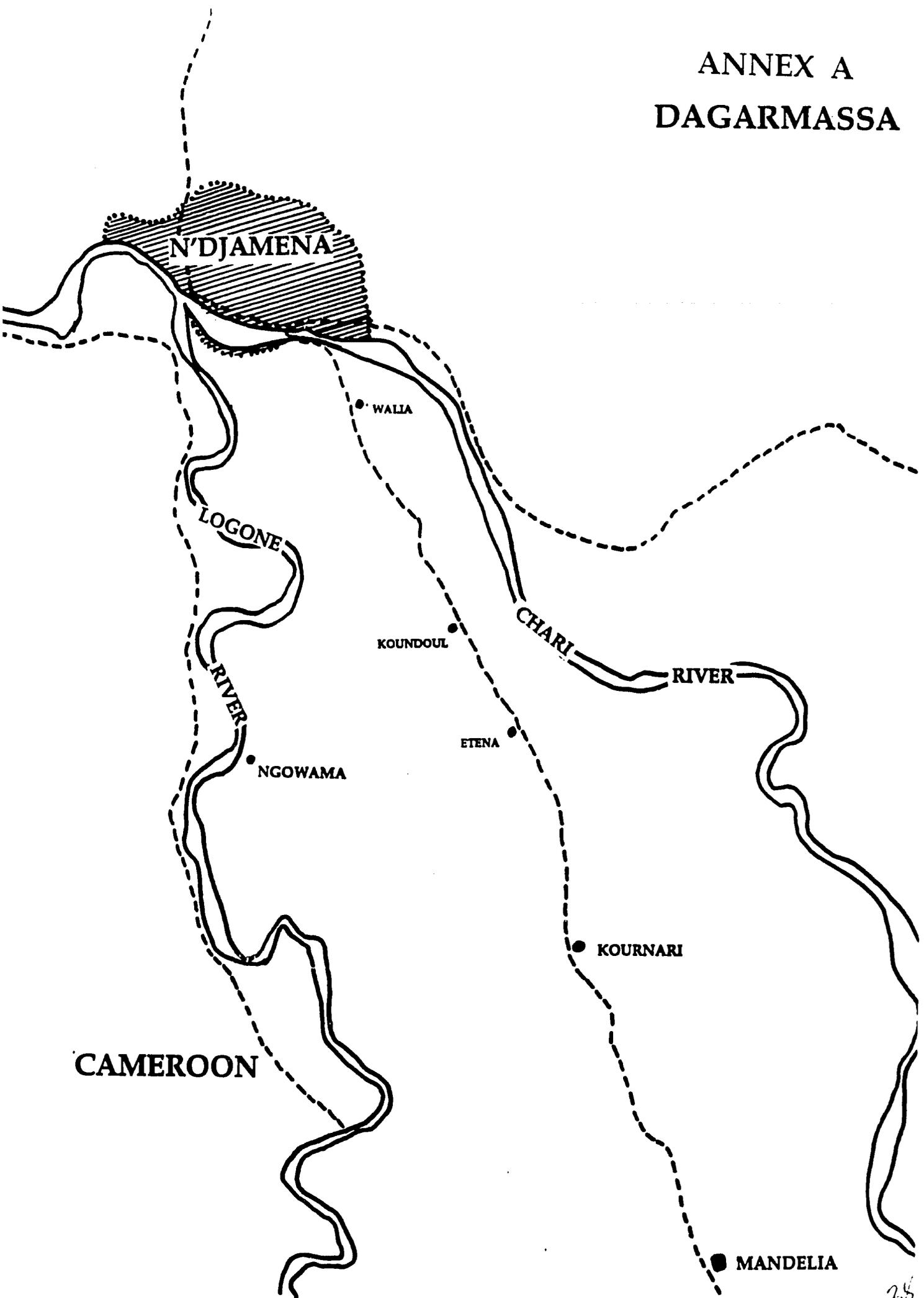
### **C. Summative Evaluation**

A final evaluation will be carried out two months prior to the project completion date. This evaluation will measure: 1) achievement of project goals and purposes, and 2) whether the pilot phase of the project should be expanded and extended. Outputs identified at project conception will be used as benchmarks in the evaluation. In addition, there will be an analysis made as to possible new directions and opportunities for project expansion to additional sites.

ANNEX A



ANNEX A  
DAGARMASSA



# ANNEX A



16

**PROJECT AGREEMENT WITH GOVERNMENT OF CHAD**

(To be added when signed)

**POSITION DESCRIPTIONS****TITLE: CHIEF OF PARTY/MARKETING SPECIALIST****LOCATION: N'Djamena, Chad****LENGTH OF CONTRACT: 2 1/2 years****POSITION DESCRIPTION:**

The Marketing Specialist will spend the majority of his/her time in N'Djamena and will have responsibilities of overall supervision of project administration and marketing activities. As Chief of Party, s/he will be responsible for:

- Establishing and maintaining contact with a myriad of government and donor agencies;
- Acting as the main liaison between the project personnel and the GOC agencies involved in project activities;
- Collaborating, coordinating and supervising Product Engineer.
- Periodic evaluations of project progress;
- Preparing and submitting project reports to AID, GOC and ACDI/W;

The Chief of Party will also act as Marketing Specialist. Duties will include:

- Establishing working relationship and defining responsibilities with SECADEV, SNV and ONDR extension agents;
- Identifying sellers groupements, wholesalers, other third parties and/or liaising with other agencies to initiate groupements who would be interested in arranging a contractual agreement with a producers group;
- Initiating/negotiating contracts between producers-transporters, transporters-sellers, producers-sellers and investigating contractual laws of Chad;
- Coordinating logistics for trial shipments and subsequent commercial shipments between field sites, transporter and seller;
- Effectuating frequent visits to the field offices to assure project progress and assess problems;
- Developing marketing-related curricula for training producer/seller groupements;
- Overseeing activities of Marketing Intelligence Officer and meeting regularly to discuss project;
- Setting-up guidelines and overseeing specific duties and responsibilities of Logistics Officers;
- Setting-up guidelines and overseeing, with assistance from

- short-term consultant, Monitoring Officer in Karal to assure similar coordination and planning between sites;
- Supervising Product Engineer;
  - Monitoring visits to Karal for field reports;
  - Evaluations and recommendations made for each trial shipment undertaken;
  - Preparing and submitting periodic technical reports to appropriate agencies;
  - Formulating project expansion design, using lessons learned during pilot phase.

**QUALIFICATIONS:**

Masters in Agricultural Marketing with emphasis on marketing groups in the developing world. Working knowledge of contract law. Experience in management information systems. Fluency in French a must. Extensive experience, minimum of five years, in Sahel West Africa, preferably Chad. At least two years managing a project in a developing country, having had primary responsibility for written communications, financial reports and administrative duties. Possession of leadership, organizational, and motivational skills a must.

**TITLE: PRODUCT ENGINEER**

**LOCATION: Karal, Chad**

**LENGTH OF CONTRACT: 2½ Years**

**POSITION DESCRIPTION:**

The Product Engineer will be primarily based in Karal during the first year. S/he will spend the second year at least half of the time in Dagarmassa setting up project activities. S/he will report to Chief of Party. His/her main areas of responsibility will be:

- Setting up and overseeing construction of field office/guest house in Karal and later in Dagarmassa;
- Hiring and training project staff;
- Establishing modus operandi for office systems and staff in coordination with N'Djamena office;
- Regular attendance and participation in groupements meetings to explain and discuss project activities;
- Designing and testing innovative techniques for low-cost packaging;
- Researching current successful appropriate technology methods or devices to assess their applicability for project;
- Provide training of trainers to extension agents for improved harvesting/post-harvesting techniques;
- Provide technical assistance in crop handling/storage techniques to villagers and local agricultural extension agents through field visits, field days and demonstrations;
- Acting as representative to Comite Technique;
- Preparing and submitting of comprehensive and timely reports to Chief of Party.

**QUALIFICATIONS:**

Minimum of Masters degree in related field. Working knowledge of French; Arabic helpful. At least 5 years field experience in appropriate technology crop handling/storage techniques. Prior experience in developing countries, preferably in the Sahel. Good organization skills. Must be able to work with minimum of infrastructure, and have an understanding of the African environment under the influence of Islam.

**TITLE: MARKETING INTELLIGENCE OFFICER****LOCATION: N'Djamena, Chad****LENGTH OF CONTRACT: 2½ Years****POSITION DESCRIPTION:**

The Marketing Intelligence Officer will be based in N'Djamena but will be travelling frequently to field sites. S/he will report to the Marketing Specialist/Chief of Party and will have as main responsibilities:

- Collection of marketing price information (farmgate and selling prices, production figures, transport costs, supply and demand, consumption pattern, consumer purchasing power, shortages and surpluses) on a regular basis;
- Establishment of database system, with assistance from short-term consultant, to allow for easy access and useful interpretations of the data;
- Publication of monthly bulletin with fruit and vegetable price and marketing information;
- Maintaining regular contact with Marketing and Logistics Officers in Karal for pertinent marketing information;
- Travelling to different production areas to gather baseline data;
- Reporting regularly to Marketing Specialist/Chief of Party.

**QUALIFICATIONS:**

University degree in agricultural and/or business administration and 2 years experience related to job responsibilities. Fluency in French and Arabic a must. Extensive experience in working with computer systems and ability to learn quickly. Good knowledge of market system and people involved in market. Good people skills and well-organized.

119

**TITLE: LOGISTICS OFFICER**

**LOCATION: 1 in N'Djamena, 1 in Karal**

**LENGTH OF CONTRACT: 2½Years**

**POSITION DESCRIPTION:**

There will be one Logistics Officer based in Karal and one based in N'Djamena. Their main responsibilities will be to:

- Maintain accurate and up-to-date records of pertinent marketing information, as identified by long-term specialists;
- Liaise with extension agents, groupements, transporters and sellers;
- Assist in setting-up trial shipments and subsequent commercial shipments;
- Gather data relating to crop planning calendar, production estimates per crop, production costs, transport systems in Karal, etc., for the Marketing Advisor and Product Engineer for use in organizing trial shipments;
- Participate in curriculum development and dissemination of market information to extension agents and groupements through field visits, demonstrations and field days;
- Furnish Marketing Intelligence Officer with marketing information on regular basis;
- Report on regular basis to Marketing Specialist/Chief of Party through Product Engineer.

**QUALIFICATIONS:**

Minimum of Baccalaureate degree. Preference given to University agricultural degree. Must be fluent in French and Arabic/Hausa. Must have ability to get along with minimum of infrastructure. Motivated, organized, self-starter. Ability to think fast on one's feet and see the whole picture.

**TITLE: MONITORING OFFICER**

**LOCATION: Karal, Chad**

**LENGTH OF CONTRACT: 2½ Years**

**POSITION DESCRIPTION:**

General duties for this position include:

- Setting-up and implementing a monitoring and evaluation system, in conjunction with Short-term Specialist and under supervision of Chief of Party, by which project can monitor itself on regular basis;
- Elaborating, in consultation with technical staff, the formats for compilation of data in areas of project management, marketing activities, training, trial shipments and market intelligence;
- Collecting primary data relating to overall project progress and impact (no. of participants, evolution of revenues, extent to which project facilities and services are used, performance of groupements, etc);
- Compiling data gathered by technical staff;
- Regular contact with groupements, extension agents, project officers for collection of data in areas of groupement business management (cash box totals, input costs, production figures), training (effectiveness of techniques used, number of people trained) and trial and commercial shipments (how many completed, how much produce sent, problems, successes, etc.);
- Undertaking baseline studies to be identified;
- Reporting weekly to Product Engineer and monthly to Marketing Advisor/Chief of Party;
- Written progress reports on regular basis;
- Recommendations for project improvement.

**QUALIFICATIONS:**

University degree in Agriculture with a working knowledge of computer systems. Extensive experience in project monitoring. Experience in monitoring and evaluation of projects. Fluency in French and Arabic. Ability to work with a minimum of infrastructure. Good written and oral communication and organization skills.

**TITLE: OFFICE MANAGER**

**LOCATION: N'Djamena, Chad**

**LENGTH OF CONTRACT: 2 1/2 Years**

**POSITION DESCRIPTION:**

There will be one Office Manager based in N'Djamena. His/her main responsibilities will include:

- Hiring, training and overseeing all local staff;
- Training extension agents;
- Putting in accounting system with assistance from Marketing Advisor;
- Procuring necessary project equipment;
- Creating a vehicle and office operations system;
- Overseeing computer database;
- Maintaining daily operations of office and general administration of project;
- Reporting to Chief of Party on periodic basis.

**QUALIFICATIONS:**

Minimum of Baccalaureate degree. Must have at least three years experience as office administrator, preferably with other donor agencies. Fluency in French a must. Must be extremely well-organized, thorough, responsible, and able to conduct a myriad of tasks at once.

**TITLE: PEACE CORPS VOLUNTEER**

**LOCATION: Dagarmassa, Chad**

**LENGTH OF CONTRACT: 1 Year**

**POSITION DESCRIPTION:**

There will be one Peace Corps Volunteer based in the Dagarmassa area who will work with the Product Engineer. Specific responsibilities include:

- Providing technical assistance in improved harvesting/post-harvesting techniques to groupements and local agricultural extension agents through field visits and demonstrations in coordination with Product Engineer;
- Regular attendance and participation in groupement meetings to explain and discuss project activities;
- Assisting in construction of improved appropriate technologies in areas of crop handling, processing and storage;
- Assisting in the researching of entry by groupements into luxury markets in N'Djamena;
- Providing periodic reports to Product Engineer and Chief of Party on activities;

**QUALIFICATIONS:**

Must be third year volunteer with demonstrated ability to work in minimum of infrastructure. Proven abilities in post-harvest crop handling, construction in appropriate technology storage and processing. Fluency in French a must; Chadian Arabic helpful. Motivated, organized, self-starter.

**TITLE: ADMINISTRATIVE ASSISTANT/RADIO OPERATOR**

**LOCATION: Karal, Chad**

**LENGTH OF CONTRACT: 2½ Years**

**POSITION DESCRIPTION:**

This person would divide his/her responsibilities between general administration responsibilities and the operation of the radio with the other field sites. Responsibilities include general office clerical work, simple bookkeeping, making logistical arrangements for short-term consultants, assisting in organization of field days, demonstrations, etc, and operating radio.

49

LOGICAL FRAMEWORK

NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS (AND TARGETS)

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

PROGRAM GOAL:

Increase small farmer incomes, within project target areas, and augment availability and affordability of fresh fruits and vegetables.

- 1) Increase in earnings of groupements after two and one half years of operations.
- 2) Increase in overall consumption of fruits and vegetables by consumers.
- 3) Increase in overall percentage of total harvest that arrives and is sold in market.

- 1) Groupement financial statements.
- 2) a. GOC and SECADEV agricultural data.  
b. Comparison of project baseline data from Yr. 1 to EOP.  
c. Independent USAID analysis of data.

- 1) Continued increased demand for fruits and vegetables.
- 2) Consumer purchasing power high enough to absorb increased production.
- 3) Continued average rainfall pattern of last 20 years.
- 4) Local population not disrupted by civil strife.

LOGICAL FRAMEWORK

NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS (AND TARGETS)

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

PROJECT PURPOSE:

1) To improve the efficiency of private sector marketing systems, within the project target areas, through the development of replicable interventions.

1. Marketing structures in place and functioning

1a. Project reports  
b. Field visits  
  
taking marketing

1a. Construction of roads is completed on time.  
b. Groupements are un-  
  
activities under project guidance.

2. Level of harvesting/post-harvesting techniques and technology improved through study tours, demonstrations.

2a. Project reports  
b. Site visits  
c. AID evaluations

2a. Competent extension workers are available.  
  
b. Improved techniques/ technologies can be found at price agreeable to farmers.

3a. Studies and research activities undertaken

3. Project reports

3a. Collaboration and information exchange between NGOs, GOC & ACIDI is possible.

b. Marketing information structure in place and functioning.

b. Groupements are organized enough to undertake these activities.

5

## LOGICAL FRAMEWORK

<u>NARRATIVE SUMMARY</u>	<u>OBJECTIVELY VERIFIABLE INDICATORS (AND TARGETS)</u>	<u>MEANS OF VERIFICATION</u>	<u>IMPORTANT ASSUMPTIONS</u>
<b>INPUTS:</b>			
1. Technical Assistance for: a) Groupement organizational principles and structure b) Marketing Techniques c) Storage Facilities d) Financial Management e) Training f) Equipment Maintenance g) Exporting h) Mkt. Survey Techniques/ Data-Gathering i) Credit	Appropriate personnel hired and trained. 1. ACDI Team: a. Marketing Spec. b. Product Engineer  Short-term Local Consul. a. Baseline Surveys  Farmer-to-Farmer Vols. a. Monitoring/Eval. Spec. b. Ap. Tech/Cond. Spec. c. MIS/Comp. Prog Spec. d. Unallocated as yet  GOC Seconded Personnel a. Mktg. Intell. Off.(1) a. Monitoring Officer(1) b. Logistics Officer(2)  Local Hire a. Secretary(2) b. Radio Op/Admin Asst(1) c. Driver/Mechanic(1) d. Guard(5)  Other ST Consultants a. Processing b. Export Specialist c. Unallocated as yet	1. Project monitoring by ACDI and AID/Chad. 2. Project reports (ACDI/Chad). 3. Action plans produced 4a. Interviews with groupement b. Project records. 5. Project financial reports (ACDI/Washington).	1. Qualified personnel can be recruited. 2. Extension agents are available to participate in project. 3. Funding timed to allow inputs to be put in place as required. 4. ACDI provides inputs on a timely basis. 5. Favorable evaluations and audits.
2. Physical	a. Office opened, equipment procured. b. Office/guest rooms constructed & operational. c. Furniture, equipment and supplies bought. d. Vehicles procured.		

LOGICAL FRAMEWORK

NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS(AND TARGETS)

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

3. Technical

- Post-Harvest Technology
  - a. Grading/Drying techniques
  - b. Processing techniques
  - c. Packing techniques
- Marketing Intelligence
  - a. Computer techniques
  - b. Tracking/monitoring techniques

57

## LOGICAL FRAMEWORK

<u>NARRATIVE SUMMARY</u>	<u>OBJECTIVELY VERIFIABLE INDICATORS (AND TARGETS)</u>	<u>MEANS OF VERIFICATION</u>	<u>IMPORTANT ASSUMPTIONS</u>
<b>OUTPUTS:</b>			
1. Improved crop handling/storage/processing techniques introduced and tested.	1a. 2 Storage facilities in Karal and Dagarmassa b. 1 appropriate technology tested for storage. c. 3 post-harvest techniques tested for handling, sorting and packaging. d. 1 improved traditional processing technique tested.	1a. ACIDI field reports b. Project quarterly reports c. Field visits d. ST study reports	1. Quality personnel hired with little turnover 2. Timely funding to have at least two full crop cycle years for trial shipments
2. Improved groupement extension services available.	2. 5 extension agents trained in marketing techniques/practices.	2a. SECADEV reports b. Site visits	3. Full support and cooperation by other NGOs involved in project
3. Transport systems identified, tested and evaluated.	3. 4 transport options tested and evaluated.	3a. Field visits b. Field reports	4. Farmers willing to test and implement new techniques
4. Market selling systems identified, tested and evaluated.	4a. 1 women's groupement identified in market. b. 6 contractual deliveries to institutions carried out.	4a. Visit to market b. Affaires Sociales records c. Project reports	5. Consumer purchasing power can absorb increased produce on market.
5. Trial shipments set-up tested and evaluated.	5. 15 trial shipments carried out.	5a. ACIDI supervisory visits b. Project records c. Field visits	6. Extension agents teach correctly new techniques.
6. Marketing monitoring and intelligence infrastructure and database set-up and functioning.	6. Publication of monthly newsletter.	6a. Project records b. ST mon/eval report	
7. Participants trained.	7a. 4-5 field visits by selected groupement members for a total of 100 person days. b. 80 field days in 4 locations for 4 crops in 2 seasons. c. 1500 people, 425 groupement members, 30 market sellers, 15 extension agents, 3 counterparts trained.	7a. ACIDI quarterly reports b. ACIDI/AID supervisory visits c. Field visits	

**GROUPEMENT PROFILES****KARAL****1. History**

The federated groupements of Karal, Guitte and Baltram began functioning between 1984 and 1986. Within each federation, Karal has 12 groupements with 151 members, Guitte has 6 with 72 members and Baltram has 11 groupements comprising 175 members. All of the groupements started operations with fees paid by members and none reported having received assistance from outside funding sources.

**2. Activities**

The main ethnic group in the Karal area is the Hausa who were fishermen before the drought but who decided to come to the Karal area to try farming during the drought. Presently, the primary activity is farming with fishing a secondary activity. There are also representative numbers of Arabs, Kanembous and Ajirae. The work ethic is very strong, with all village members encouraged to join a groupement, not only for cultivating a field but for the social ties that it insures.

**3. Production**

There are three plantings a year using the recessional flood system of agriculture. The primary vegetable crops under cultivation are okra, hot peppers, onion, and tomatoes, with melons, cucumbers and potatoes cultivated to a lesser extent. Accurate production figures don't exist as total quantities produced are not written down and there are no standard weights of measurement. Only about 50% of the total land owned by the groupements is in production.

Most members accompany their produce to sell in N'Djamena, because it is difficult to find a transporter from N'Djamena who will come to villages and buy from producers and also the producers are suspicious of letting others negotiate a selling price for them. The cartons are usually sold to wholesalers, who don't pay the producer until it is sold. Therefore, a producer may be able to go down and back in the same day if the market is good, or he might have to stay for several days waiting for his goods to sell if the market is bad.

**d. Structure**

To be a member, one has to live in the village and pay the monthly fees, which average about 200CFA/month/member. This small revolving fund, which constitutes an average balance in the cash drawer of about 100,000CFA, helps members by giving

55

them credit to buy seeds and access to an emergency fund to buy medicine for sick family members. However, these two funds are kept separate in the accounting system, which Dutch volunteers are helping to set-up and implement.

Each committee is composed of a president, vice-president, secretary, treasurer and stock person. The committee meets weekly, and the general assembly meets monthly.

The right to give land is reserved by the Sultan. There is often an Adjoint de Chef de Canton who is responsible for showing a family which plot they can cultivate. There is no charge for the use of the land, as the earth is believed to belong to God, but the unwritten law is that after the harvest, a certain percentage (usually a couple sacs of grain) is given to the Sultan. Members do not have to cultivate their plots but can hire someone to do it for them at a rate of about 1000CFA/day.

### 5. Problems

The principal problems expressed by the groupements were the difficulty in getting a good buying price for their produce, the lack of conservation methods needed to process excess produce after harvest, the saturation of the market from January to April, resulting in a large percentage of the tomato crop going bad, and the difficulty, unreliability and cost of transport. One member gave an example of transport costs saying that he had to pay a commercant 45,000 CFA in transport fees alone to bring 20 100 kg. sacs from his field to Baltram, a total of 6 km. Another farmer said that he had sold 150 cartons of tomatoes last year and only received 50,000 CFA for the whole shipment, from which he had to pay all of his costs of production.

Secondary problems were having to keep the land in constant cultivation, because once vegetation grows, it takes 3-4 weedings before one can seed again; the unavailability of quality seeds; and huge losses due to birds and insects eating crops. Due to the lack of formal education of the groupement members, no records are kept, although SECADEV and PNUD/SNV have been doing quite well in teaching members simple accounting methods.

### 6. Role of Government

All groupements said that they have no relation with the government, but qualified the statement by saying that as of yet they aren't making any money. If, in the future, they start realizing a profit, they all felt that the government would step in to claim a portion of their profits.

## DAGARMASSA

### 1. History

The Dagarmassa area groupements started functioning in 1985, with the N'Gouma group receiving financing for a pump from CARE/Chad and the Dando/Konaye groupement getting a loan from VITA for the purchase of a pump. In addition to this financing, each member pays monthly dues for the use of the pump. The seeds are bought at ONADEH. The N'Gouma group has 23 members, while the Dando/Konaye has about 13 members. Each producer has an average of 5-6 people family members helping to work the fields. The Dando/Konaye has pre-cooperative status which they applied for in order to get a loan from VITA.

### 2. Activities

The principal activities for both groupements are grain cultivation with the main vegetable production period coming after the harvest of the millet and corn from December to April. Primary vegetables under production are onions, okra and tomatoes with small amounts of melons, leeks and eggplant.

### 3. Production

Total surface area of the land owned by the groupements is 45 hectares, with N'Gouma having just under 5 hectares and Dando/Konaye having 40 hectares. However, of the 40 hectares only 13 hectares are under production and of those 13, between 3-4 are for vegetable production. Each hectare is divided into 37 parcels or lots. The N'Gouma groupement harvested 19.5 tons per hectare of onions from September 1988-February 1989. This works out to between 13-30 sacs (95 kg.) per lot. Selling price per sac depends on the moment at which it is put on the market. In the beginning of the season, the price is 6000 CFA/sac; mid-season it is 4500 CFA/sac; and end of season it is 5000 CFA/sac.

Depending on the groupements transport situation, they may or may not prefer to sell directly in the market. Dando/Konaye own two 404 pick-ups and, thus, prefers to sell directly in market and not to another groupement or transporter. They said they've had to limit production because they can't find a market. On the other hand, the N'Gouma producers preferred to sell directly to commercants who came with their trucks to the production site.

### 4. Structure

The committee structure seemed less organized than Karal area, with general assembly meetings only once a year, and the committee itself only meeting "every now and then". Each member

is required to cultivate his plot and cannot pay someone else to work it.

### **5. Problems**

A major problem cited was the difficulty in selling all that is produced and consequently, the Dando/Konaye groupement has taken land out of vegetable production. They also mentioned their competitors in Karal who bring in a lot of produce at once and flood the market. Another problem was the abundance of parasites and insects who, says one farmer, "make it difficult to succeed". Lack of storage facilities was indicated several times. The members are very articulate in identifying and explaining problems, and realize that some sort of system of planned national production has to be created, in order for the producers to exert more control over the market, get the best possible prices, and provide a steady supply of fruits and vegetables throughout the year to the market.

### **6. Role of Government**

The only contact the Dando/Konaye groupement has had with the government is when it applied for pre-cooperative status at the Direction de l'Industrie et des Cooperatives at the Ministry of Commerce and Industry. Since they've submitted their application, there has been no further government intervention for payment of taxes, etc.

A copy of the questionnaire used when interviewing the groupements and assembling the above groupement profiles is on the following two pages.

### ENQUETEUR QUESTIONNAIRE GROUPEMENTS

NOM DU GROUPEMENT SURFACE TOTAL  
NOMBRE DE MEMBRES VILLAGE

#### HISTOIRE DU GROUPEMENT

- 1) Depuis quand etes-vous formes en groupement?
- 2) Avec quel financement avez-vous commence?
  - a. Cotisation des membres?
  - b. Aide des ONGs?
  - c. Les deux?
  - d. Autres sources?
- 3) Combien de membres aviez-vous au debut? Et actuellement?
- 4) Quelles difficultes avez-vous rencontre au debut? Comment ont-elles ete resoulues?

#### ACTIVITES DU GROUPEMENT

- 5) Quels sont les activites principales du groupement?
- 6) Quels sont les activites secondaires? (Achat des semences, recherche de marche, recrutement des membres, apprentissage des nouveau techniques maraichage, gestion)

#### STRUCTURE DU GROUPEMENT

- 7) Quels sont les conditions pour etre membre de la groupement?
- 8) Avez-vous elu un comite?
  - a. Comment se compose-t-il?
  - b. Quel est la frequence des reunions?
  - c. Quels sont leurs responsabilites?
- 9) Quels sont les responsabilites des membres?
- 10) Les membres doivent-ils necessairement cultiver leurs terres?

- 11) De combien est la cotisation? Combien de fois par an?
  - a. Qu'achetez-vous avec ce fonds?
- 12) Est-ce qu'il y a d'autres frais qu'on doit payer? Si oui, lesquels?
- 13) Offrez-vous le credit aux membres? Si oui, a quels termes?
- 14) Reinvestissez-vous une partie des fonds pour la capitalisation du groupement?
  - a. Avez-vous achete des equipements avec le benefice que la groupement a realise?
- 15) Quel est le montant moyen dans la caisse pendant l'annee?
  - a. Avez-vous un compte a la banque? Quel est le montant?

#### **PROBLEMES IDENTIFIES PAR LE GROUPEMENT**

- 16) Rencontrez-vous des problemes dans l'operation de votre groupement? Si oui, quels sont-ils? (Le gestion, le marketing, la comptabilite, la production, la communication entre membres?)
  - a. Comment peuvent-ils etre resolus?
- 17) Avez-vous un probleme de recrutement de nouveaux membres?
- 18) Est-ce que le comite communique regulierement avec les membres pour discuter les problemes?
  - a. Les membres et le comite, voient-ils les problemes de la meme maniere? Expliquez.
  - b. Comment resoudez-vous les problemes?

#### **ROLE DU GOUVERNEMENT**

- 19) Actuellement, exist-il une relation entre votre groupement et le gouvernement? Si oui, comment ?
- 20) Voulez-vous que le gouvernement joue un plus grand role dans la groupement? Si oui, comment?
- 21) Payez-vous des taxes au gouvernement pour votre production? Si oui, comment est-elle calculee?

## N'DJAMENA MARKET SURVEY

## F.1. METHODOLOGY

In the absence of secondary data concerning the market structure and its operation, a rapid market survey was carried-out over a five day period during the course of the mission. USAID/Chad is currently conducting a more comprehensive survey, but findings were unfortunately not available prior to finalization of the present report.

Five sets of questionnaires were prepared, each addressing a specific segment of the marketing chain, i.e. transporters, wholesalers, retailers, consumers and institutions. Questionnaires were prepared by the consultant after visits to three markets in N'Djamena, then tested, revised, and subsequently administered by 3 interviewers to 20 randomly selected respondents in each category (except Institutions, 8). Interviewers were thoroughly briefed, and questionnaires were reviewed after the first day of interviews. Subsequent interviews were conducted without supervision, while the consultant was in the field. (See Appendix F.1. for sample questionnaires).

Interviews, which required 30 minutes on an average, were constrained by respondents' reluctance to divulge information on value of sales and purchases, and by most inaccurate units of measurement commonly used on the market, such as heaps, bundles, cups, boxes, sacs of various shapes and sizes.

The information yielded by the survey has therefore indicative value, and provides a general idea of marketing practices in N'Djamena. (See Appendix F.2. to F.6. for data tabulation).

## F.2. EXISTING MARKET STRUCTURE AND ORGANIZATION

The market is a vitally important institution in Chadian society and culture, with a special place set aside for this purpose in every village. Local market-day, always on the same day of the week for a given place, is a major, if not the event, from an economic but also social view point, where farmers interact with local buyers and out-side traders. The structure in this case is quite simple and the volume traded quite small, the producer exchanging, generally through cash transactions, the excess of his production over family consumption, for such essential commodities as salt, sugar, oil, cloth, matches, kerosene and the like.

Besides the village market, there exist the consumer markets of larger towns, the most important being N'Djamena with its estimated population of 544,000 which accounts for as much as 60% of the total urban population of the country.

## URBAN POPULATION : 1982 and 1988 PROJECTIONS

	1975	1982	1988
N'Djamena	224000	378851	544000 **
Abeche	32000	54560	70928 *

Sarh	50000	77699	101009 *
Mondou	45000	69930	90909 *
Bongor	15700	24399	31719 *
Fiango	11100	17259	22437 *
Doba	15000	23322	30319 *
Mao	5500	9180	11934 *
Moussoro	7700	12858	16715 *

Source : Seminaire National sur Population et Developpement au Tchad  
 NDjamena, 10-14 Decembre 1984  
 Nations Unies, Commission Economique pour l'Afrique  
 1988\* : Mission estimates  
 1988\*\* : Enquete Legere sur les Conditions de Vie des Menages  
 a N'Djamena, Direction de la Statistique, Ministere  
 du Plan, 1988

In the case of larger volumes, generated by market oriented production, the absorption capacity of the village market is soon exceeded, and the target market is shifted to the urban centers, particularly N'Djamena. Here the producer is confronted with a far more complex and segmented system, the elements of which are beyond his control. This market structure is comprised of transporters (sample of 22), who collect produce in the villages and deliver it to the town markets, wholesalers (sample of 20) who deal generally in larger quantities of a limited range of products, retailers (sample of 21), consumers (sample of 20) and institutional consumers (sample of 8) such as hotels, restaurants, army etc.

#### TRANSPORTERS

The sample is comprised of transporters delivering to the Central Market (10), Dembe (3), Cholera (3), Mil (3) and Diguel (3), which are the five most important of N'Djamena's 14 markets where fruits and vegetables are sold.

Transporters can be grouped according to the size of their operation, ranging from push-carts (5), bicycle (2) and motorcycle (1), to pick-ups (4), 5 ton trucks (5) and up to 20 or 30 ton truck (7) operators. While small operators owned only one vehicle each, several truck operators owned more than one vehicle each.

Transporters supplying N'Djamena markets, are mostly N'Djamena-based (70% of respondents), and tend to operate on fixed routes between the collection point and the market, both of which may vary somewhat according to season. They generally do not stop for collection along the road. About 20% of the transporters (all N'Djamena based) service the Karal area using pick-ups or 5T trucks and average 7 trips per week during dry season and 2 to 3 during wet season. Another 20% service the area from Walia to Mandelia (all but one are based in these towns), using push-cart (Walia, 7 km) or pick-ups, effectuating as many as 3 trips per day. Large trucks service the more distant production areas such as Abeche, Doba and Sarh.

Carriers are generally loaded to capacity and more, average weights being 20 T per 20T truck, 5 to 7 T per 5T truck, 1 to 1.2 T per pick-up, 300 kg per push-cart, 200 kg per motorcycle or bicycle load.

62

The nature of transport operations may range from "service" or strict transport for cash payment (36%) to "trade" or purchase for resale after transport (74%). While farmers in Karal complained that transporters refuse to buy their produce in Karal, four transporters servicing Karal claim they always take ownership of the produce they carry. Transport from Koundoul and Mandelia is done primarily on a cash basis.

80% of the respondents said that they routinely transport fruits and vegetables.

Where transporters buy the produce, 63% buy directly from the producer, 21% from traders, and 18% from their agent. One push-cart operator in Walia transports his own produce to the market. Few buy regularly or frequently from the same supplier. Purchase is claimed to be always on a cash basis, and sales are either to retailers (60%) or to wholesalers (37%). The Walia producer cum transporter sells retail. The number of buyers per shipment ranges from 2 to about 25 and the time required to sell from 1 hour to 1 day, except for large 20T loads which may require up to one week. Seventy percent of sales are made on a cash basis with a small percentage paying part cash immediately and the rest when the produce is sold.

Where only transport service is provided, eighty percent of the time the owner (producer or trader) accompanies the produce.

Transporters would like to see the following improvements: roads (63%), organizing producers/collection points (20%), better quality produce (15%).

#### WHOLESALEERS

Fruit and vegetable wholesalers also differ widely in size and nature of operation. While there are only about a dozen large traders (those who deal in 20 to 30 T truck loads) in each of the six main markets of N'Djamena, there are several hundred small wholesalers and wholesalers cum retailers. The sample was comprised of 40% large, 50% medium and 10% small wholesalers.

Wholesale trade is dominated by men (65%), although several female traders in the N'Djamena market were reported by village groupements and interviewed (35% of the sample).

Large traders tend to specialize in one or two crops (such as onion and garlic, or tomato and gombo, or tuber crops) or by source of supply (such as onion from Ouaddai, or banana and mango imports from Cameroun), smaller traders tend to deal in a broader selection of commodities according to availability and season.

Eighty percent of wholesalers buy their stock from the producer and/or from transporters (65%) and/or from other wholesalers (10%). Large traders generally buy directly at the source from several producers or through appointed/commission agents who assemble loads, using their own trucks. Smaller wholesalers may procure their supply from other

63

wholesalers or transporters cum wholesalers, from producers delivering to the market (by owned or hired carriers), or at the source (frequently from relatives) using owned or hired transport.

Payment for produce is primarily on a cash basis (65%), although deferred payments (generally by a few days, until resale is completed) are not uncommon (30%) but are usually restricted to transactions with relatives. Payment by invoice or barter trade is not practiced.

Difficulties in securing supplies are faced frequently by 35% of the wholesalers and occasionally by 65%. These difficulties occur during rainy season (65%) and the hot dry season (35%).

Eighty-five percent of the wholesalers said they sell their produce to retailers, forty percent to other wholesalers and consumers. The question may have been misunderstood, but less than 10% of wholesalers claim to have a fixed clientele, while as many as 50% claim to never sell to the same client. Most sales transactions are on a cash basis (80%), only 10% saying they give credit.

Wholesalers' had the following to say about product and market quality:

- product quality was acceptable (90%);
- the range of products available was acceptable (45%), should be improved (45%);
- regularity of supplies should be improved a lot (75%), somewhat (25%);
- purchase prices should be reduced a lot (50%), somewhat (50%), and that price stabilization schemes are required to avoid wide and sudden price fluctuations;
- market installations and facilities, particularly storage should be improved a lot (85%). Storage facilities and product conservation are serious problems faced by wholesalers, who currently only have access to rudimentary sheds for storage. The resulting trend among traders is thus to buy no more than what can safely be resold within a few days.

The most serious problems faced by wholesalers are delivery-related, resulting from the poor conditions and unreliability of the roads and the transport fleet, lack of supplies during the rainy season, lack of conservation and storage facilities on the market, as well as occasional lack of demand on the market.

Data on the financial aspects of wholesale is unreliable and presented as a rough indicator only.

Weekly purchases during the dry season range from CFA 31,000 to over 2.5 million per wholesaler (average CFA 360,000), the most frequent range being between CFA 100,000 to 300,000. During wet season, purchases are generally lower and some merchants stop their operations altogether.

#### RETAILERS

Fruit and vegetable retail in N'Djamena is almost exclusively limited to the six main markets and eight smaller markets of the city, and three supermarkets catering to the luxury market. Sidewalk stands and

61

itinerant sellers are not common.

Large retailers, who may also act as wholesalers, comprised thirty percent of sample, twenty-five percent were medium retailers, those who generally "own" a larger retail space with tables and occasionally a small adjoining storage room, and forty-five percent were small, those who generally "own" a small retail space with or without makeshift shading and display stands. Women are more frequent among small retailers, accounting for about 50% or more of the 100 to 250 fruit and vegetable sellers, with permanent space, on each of the larger markets.

Although not reflected in the survey, the number of retailers decreases significantly (by about one third to half) during rainy season due to lack of supplies and the move to the villages to produce millet for domestic consumption.

Similarly to wholesalers, the majority of retailers prefer not to sell commodities that vary on daily or seasonal basis. 20% of the retailers interviewed bought their supplies directly from producers, while 80% claimed to buy from "contract producers" (which may have been misunderstood by interviewees). None claimed buying from wholesalers or from transporters, and no retailer appeared to always buy from the same supplier.

Generally, all purchases are on cash basis, only 15% stated buying occasionally on credit (of a few days).

Sales are always made in the same market, always to consumers visiting the market and always on cash basis. About half the retailers appear to have some regular clientele.

All retailers felt that the quality and freshness of the produce they buy should be somewhat improved. 25% had frequent and 65% occasional problems in procuring supplies, shortages occurring for 40% during cool season, for 35% during hot season and for 65% during wet season.

The main problems expressed by the retailers were: the absence of storage space on the market (95%), which forces sellers to carry unsold stocks daily to their home at high local transport cost (50%); lack of equipment for stands, display and shading (30%); as well as insufficient demand and slow sales (30%).

The value of produce purchased weekly per retailer ranges from FCFA 12,000 to close to 400,000 during dry season (with an average of 78,000, the most frequent range being between CFA 15,000 and 35,000). Purchases fall to less than half that amount during rainy season, ranging from CFA 2400 to 100,000 with an average of 28,500.

#### CONSUMERS

The sample of consumers was comprised of 19 female and 1 male respondent, 10% of whom were below age 20, 75% between 20 and 50, 5% over 50 years old.

The distribution of the sample by monthly income (derived from the profession of the head of household) was 10% with income of CFA 25,000

65

or less, 40% with income between 25,000 and 50,000, 40% between 50,000 and 100,000, 10% with income over 100,000. The design team would add that these figures reflect a bias on the part of the interviewers to interview people similar to their own socio-economic background. What this bias means is that the average income of the respondents is much higher than the average Chadian.

Size of households (i.e. number of persons fed) ranged from 1 to 8 adults and 1 to 12 children, with an average of 3 adults and 6 children.

Shopping in the market is done on a daily basis, with households averaging six visits per week. Fruits and vegetables are almost exclusively bought in the market, with only 15% making occasional purchases from street vendors.

Buyers do not seem to have a particular retailer from whom they always or regularly buy. Payment is always cash.

Most people (60%) chose proximity to the home as the main reason for buying from a particular market, 35% said lower prices was how they chose a market and 25% frequented their particular market because of its greater choice of fresh produce. While "greater choice" was always mentioned by users of the Central Market, "lower price" was mainly mentioned for Dembe and markets other than the Central Market.

Consumers felt that produce quality should be improved somewhat (45%), the range of product should be improved somewhat (25%) or a lot (30%), regularity of supply should be improved somewhat (35%) or a lot (20%), prices reduced (50%), market installations improved (50%). Physical improvements to the market identified by the respondents included decreasing congestion (no room to move), improving cleanliness and drainage (stagnant water and mud during rainy season).

The weekly value of fruit and vegetable purchases ranged from CFA 675 to 9,100 averaging CFA 5,000 per household during dry season, and from CFA 425 to 7000 or an average of CFA 3200 during rainy season. These figures are considerably over-estimated, due to the method by which they were derived, i.e. extrapolation of the average daily quantities purchased at prices quoted by the consumer (end of June, when prices are high).

#### INSTITUTIONS

The main institutional buyers in N'Djamena include the French Army Base (Epervier), three supermarkets, three hotels and several restaurants. These constitute luxury markets, where constant quality, regular and reliable supplies are required. Seven restaurants and one hotel were covered by the survey.

Two of the hotels, the supermarkets and particularly Epervier, with a contingent of over 1000 men, are large consumers of fresh fruits and vegetables. Supplies are currently provided during season by a few expatriate intermediaries who select, grade and repackage produce available in the local market. During the off-season, supplies are

imported from neighbouring countries as well as air-freighted from Europe.

Restaurants and the Chari hotel buy all their fruits and vegetables in the local market, two buying also on occasion from wholesalers. Payment is generally cash.

Improved quality and freshness of produce offered on the market, regularity of supplies, and reduction in price or at least price fluctuations were the needs most frequently expressed by the respondents.

The value of weekly purchases by these institutions averages CFA 107,000, ranging from CFA 20,000 to 310,000 during dry season, and from 12,000 to 140,000 with an average of CFA 47,000 during rainy season.

#### INTERMEDIARIES

Numerous intermediaries are active along the different levels of the supply chain. The most pertinent to the project would be the commission agents at the central market, including several women, who act on behalf of producers both from the southern irrigation perimeters and the Karal area. For a flat fee of CFA 250 per sack or crate, the intermediary will sell the produce for the farmer, to a network of mostly retailers.

### F.3. SUPPLY, DEMAND AND CONSUMPTION PATTERN

#### VARIETY AND VOLUME OF PRODUCTS ON THE MARKET

The main types of fruits and vegetables produced in the Sahelian zone and around N'Djamena are, in order of importance, tomato, okra, onion, watermelon and melon, which together may account for as much as 90% of the total tonnage harvested. Other relatively common vegetables, although in much smaller quantities, include eggplant, green beans, sweet and hot peppers, lettuce, carrot, leak, cucumber, oseille, and various green leaves. Common tuber crops are sweet potato, potato, manioc and yam. Fruit production is limited to a few gardens along the Chari and Logone rivers, which produce relatively small quantities of citrus (limes, oranges and grapefruit), mango, guava, avocado and further north, dates.

#### AVAILABILITY OF LOCAL FRUITS & VEGETABLES ON THE N'DJAMENA MARKET

	FROM	TO		
TOMATO	(Nov-Dec) Jan	Apr	(May)	(Imported)
ONION	Jan	Dec		
EGGPLANT	Dec	Jun		
GR BEANS	Nov	Jul		
OKRA	Jan	Dec		
CARROT	Dec	Jun		(Imported)
LETTUCE	Sep	Jun		
SPINACH	Oct	May		
PEPPERS	(Oct) Jan	Apr	(Jun)	(Imported)

67

POTATO	Oct	Jun	
BANANA			(Imported)
ORANGE	Mar	Jun	(Imported)
LIME	Mar	Jun	
MANGO	Mar	Jun	(Imported)
GOAVA	Jan	May	

Cultivation of most vegetables starts toward the end of the wet season (September - October) and continues during the cool part of the dry season, usually until - February. Thus, deliveries to the market start in December, reach a peak from end of January to mid-March, and taper off by mid-June. From mid-June to December, very few locally grown vegetables are available, a period during which the market depends almost entirely on imports from Cameroun, Nigeria, Magreb countries, and to a lesser extent, from Europe.

Scattered and fragmented data on cultivated area and volume of production is currently being compiled by BIEP under the RSA project. This study estimates that for 40 irrigated perimeters (along the rivers, mostly south of N'Djamena) the total area under vegetable production is around 300 to 400 hectares, the field output of which is around 3000 to 4000 MT. On the other hand, SECADEV records show the estimated production of 103 groupements with 1600 members in 16 villages of the Karal area for the 1988-89 season, to be 6570 MT melon, 10,600 MT watermelon, 1460 MT tomato, 6240 MT sweet potato and 8840 MT manioc, for a total of 33,710 MT.

It would appear, that only a relatively small portion of the Karal production reaches the market, due to extremely high post-harvest and transport losses, and to some produce not being harvested at all. A more detailed estimation of production and supply by the ACIDI design team is presented in Annex H.

Data on fruit and vegetable demand/consumption is non-existent. The rapid consumer survey by the design team indicates that monthly expenditure for fruits and vegetables is closely linked to family income and might range from CFA 1600 to 6,000 for low/uncertain income households, from CFA 6,000 to 20,000 for low to medium but regular income families, and from CFA 20,000 to 35,000 for high income groups, depending largely on size of the households. These figures are possibly somewhat over-estimated, but are corroborated by other indirect sources.

#### HOUSEHOLD EXPENDITURES OF FRUITS AND VEGETABLES (N'DJAMENA - 1988)

			1972 *
Tubers		0.7%	
Vegetables	(Users)	4.5%	4.7%
Onion	98.3%	0.8%	
Okra	96.4%	1.4%	
Green leaves	68.1%	0.7%	
Other	66.0%	1.6%	
Fruits	77.6%	1.1%	0.5%

Source : Enquete Legere sur les Conditions de Vie des Menages :

N'Djamena, Direction de la Statistique, Ministère du Plan, 1988

- \* Structure de dépenses des ménages, Indice des Prix à la Consommation (Nov 1987), Ministère du Plan et de la Coopération.

The above survey, based on a stratified sample of 300 households, concluded that average expenditures for tubers, vegetables and fruits accounted for respectively 0.7%, 4.5% and 1.1% of total household expenditures. The total number of households in N'Djamena is established at 67,000 for a population of 544,000. The survey does not give the actual amount of family income or expenditures.

Therefore, assuming an average disposable income of CFA 80,000 per household, monthly expenditures per household for fruits and vegetables would be CFA 5040 per month :

	CFA/household/month
Tubers	560
Vegetables	3600
Onion	640
Okra	1120
Green leaves	560
Other	1280
Fruits	880
Total	5040

Assuming further average prices, as per ONADEH's monthly records, the monthly and annual quantity purchased per household and the entire N'Djamena market may be derived as follows :

	CFA/kg	Kg/Household		MT/N'Djamena	
		/mth	/year	/mth	/year
Tubers	182	3.1	36.9	206.2	2473.8
Onion	198	3.2	38.8	216.6	2598.8
Okra	354	3.2	38.0	212.0	2543.7
Green leaves	223	2.5	30.1	168.3	2019.0
Other	370	3.5	41.5	231.8	2781.4
Fruits	377	2.3	28.0	156.4	1876.7
Total		17.8	213.3	1191.1	14293.5

Under these assumptions, the current tuber, fruit and vegetable consumption in N'Djamena would amount to close to 1,200 MT per month or 14,300 MT per year, which appears to be still a low estimate.

#### RURAL HOUSEHOLD CONSUMPTION

Average daily consumption per adult-equivalent in Gr/day

Sample households	Mao	Cheddra
	81	70
Haricot (Niebe)	5.7	10.0
Tomato fresh	60.0	59.8
Tomato dried	6.9	8.8
Gombo dried	10.3	8.3
Hot pepper dried	1.9	1.7

Onion fresh	24.7	47.9
Onion dried	1.0	1.8
Total (fresh-equivalent)	192.0	219.0

Source : Enquete Alimentaire et Nutritionnelle dans le Kanem Rural, CNNTA, CRDI, Universite de Montreal - 1988.

Estimated consumption per rural household (7 ad-equiv)

	kg/mth	kg/year
Haricot (Niebe)	1.7	20.1
Tomato	21.0	252.3
Gombo/okra	10.6	126.6
Hot pepper	1.6	19.2
Onion	8.9	106.9
Total	43.8	525.1

Assuming 50,000 households for a rural population of 450,000 in the Chari- Baguirmi Prefecture, the annual rural consumption of vegetables would amount to about 26,000 MT, including over 12,000 MT of tomatoes. The lack of market outlets and high transport costs in the production areas (and the perishable nature of tomatoes) could explain such a comparatively high rural consumption rate, the farmer's alternative being to see his production go wasted.

#### IMPORTS, SHORTAGES AND SURPLUSES

Fruits and vegetables available on the N'Djamena markets are of local origin, or imported (particularly fruits) from neighbouring countries. Small quantities are also imported from Europe for the luxury market.

Domestic products come generally from within a 200 km radius of N'Djamena, with the exception of onions and garlic supplied by Ouaddai and dates from the Saharian zone.

Most imports from neighbouring countries are from Cameroun and Nigeria. Such imports appear to be dictated by local availability, price and logistic considerations. Imports concern mainly fruits (particularly banana, mango and citrus) and vegetables, with the majority being imported during the off-season from June to December.

The volume and value of imports is difficult to estimate, because of the absence of relevant statistical data on the subject, and reluctance of importers to divulge information on unofficial/illegal imports. Imports of processed fruits and vegetables (tomato paste and fruit juices) appear to have a significant share of the market.

Imports recorded by the Customs Service are classified as follows :

- Fruits and vegetables, prepared, with and without vinegar (19 MT in 1985 and 51 MT in 1986)
- Frozen fruits (650 kg in 1986)
- Fruits and skin of fruits (640 kg in 1985 and 30 kg in 1986)
- Fruit paste and jams (3,9 MT in 1985 and 1.4 MT in 1986)
- Fruit juices (6.7 MT in 1985 and 7.5 MT in 1986)

for a total of 30 MT in 1985 and 60 MT in 1986. These figures refer to airfreighted imports from France and Cameroun, and do not reflect the

massive arrivals by road and across the river.

The fruit and vegetable market of N'Djamena is characterized by alternate short periods of excess supply between January and March and long periods of shortages from July to December, for most fresh products. As a result, canned food (including imported tomato paste) is an important component of the households' diet. The availability of crops such as melon, lettuce, sweet pepper, eggplant, green beans and in particular tomato, is highly concentrated between January and March. Other, more traditional vegetables such as okra, green leaves, oseille are available fresh in large quantities from December to June, but also year-round in smaller quantities. Dried okra and tomato are available year-round.

#### F.4. LOGISTICS

##### TRANSPORT FACILITIES AND ORGANIZATION

With the discontinuation of the Cooperative des Transporteurs Tchadiens (CTT), which had a virtual monopoly on the country's road transport, more open competition is expected to improve the transport service in the outlying production areas.

Efficient transport is constrained by several inter-related factors, the most important of which are poor road conditions, limited transport capacity of the truck and an over-aged vehicle fleet. These constraints result in high costs and unreliable services to the producer and are further compounded by the lack of communication and information systems. Produce losses during transport are very high. They are caused by shocks due to road conditions and unsuitable containers and breakdowns of carriers which may take several hours or days to get repaired. Losses appear to occur mainly at the producer's and consumer's expense.

Cash cost of transport is also high, because of scarcity of local vehicles and the weak bargaining position of the producers. Prices are fixed by the transporter on the basis of type of load (bulk) and container, road and weather conditions, distance to be covered, and whether it's a one-way or round-trip. Examples of transport costs to the N'Djamena market are given below :

FROM	DISTANCE	CONTAINER	CROP	WEIGHT	COST	CFA/KG
	KM			KG	CFA	
N'Gueli Road side passenger	8	box	tomato	60	200 200	3.3
Gaoui village passenger	11	basket	lettuce	40	250 250	6.3
Dangarmassa	35	box	melon	50	750	15.0
	35	sac	onion	100	1000	10.0
CHARB (subsidized)	85	box	tomato	50	500	10.0
unsubsidized	85	box	tomato	50	625	12.5

Guelendeng	160 box	tomato	60	1500	25.0	
	160 box	tomato	50	1000	20.0	
	charter 10T truck	160 box	tomato	8800	180000	20.5
	404	160 box	tomato	1500	40000	26.7
Karal	105 box	melon	50	2000	40.0	
	105 sac	sw.potato	120	2000	16.7	
	105 box	tomato	60	1750	29.2	

The above figures show the variability of transport costs, depending on location and commodity. The UNDP/OPS transport service which distributes food aid, currently operates its 20T trucks at a cost of CFA 76 to 100 per kilometer ton on most routes. At present, the trucks return empty, but if proper coordination could be achieved they could offer rates as low as CFA 25 per Km/T for full 20 ton loads from Karal.

Also, on-going road construction and improvement projects, dismantling of the CTT monopoly and privatization of parts of the UN relief fleet are expected to substantially remove these bottlenecks.

Other costs that must be borne by the producer are various official and unofficial taxes levied along the roads (rain barriers and Eau et Forêt inspection barriers) and at the market gate, as well as costs for loading, unloading (CFA 100 to 150 each per sac or box), watchmen (CFA 100 per night and per box), and commission agent fees (flat rate of CFA 250 per box or sac).

#### MARKET INFRASTRUCTURE AND STORAGE

The N'Djamena market infrastructure is extremely basic and adequate storage facilities are non-existent, a situation which contributes significantly to losses and spoilage. As indicated by the rapid market survey, wholesalers and retailers see lack of market storage and product conservation facilities as one of their main constraints.

Several bilateral and international projects, at the implementation or pre-implementation stage, include a provision for construction of cold storage facilities in N'Djamena markets. To date, none have been executed, mainly because of the uncertainty with regard to the economic viability of such measures.

#### F.5. PRICE FORMATION AND TRADE PRACTICES

The following price formation overview of for fruits and vegetables found in the N'Djamena market, is based on the mission's field interviews and rapid market survey, including cost of production, farmgate price, wholesale and retail prices, as well as a rough breakdown of marketing related costs arising out of trade practices and official and unofficial fees. Prices have been calculated for both dry and wet season production.

## AVERAGE PURCHASE PRICE CFA/KG

	W/SALE	RETAIL	CONSUMER	INSTITU	W/SALE	RETAIL	RETAIL
DRY SEASON					TO RETAIL	CONSUM	INSTIT
TOMATO	66	71	219	252	8%	211%	257%
ONION	88	105	139	172	19%	32%	64%
OKRA	94	113	283	275	20%	152%	144%
LETTUCE	104	119	254	246	15%	113%	107%
PEPPERS	117	155	539	500	32%	248%	223%
POTATO	118	158	254	250	34%	61%	58%
BANANA	150	192	487	321	28%	154%	67%
ORANGE	127	182	236	218	43%	30%	20%
MANGO	82	129	302	243	57%	134%	88%
LIME	71	75	586	474	5%	681%	532%
AVERAGE	105	136	301	275	29%	122%	103%
WET SEASON							
TOMATO	91	119	788	725	31%	562%	509%
ONION	114	138	271	221	21%	96%	60%
OKRA	70	90	361	328	29%	301%	264%
LETTUCE	112	140	490	401	25%	250%	186%
PEPPERS	109	143	1061	483	32%	642%	238%
POTATO	115	270	324	300	135%	20%	11%
BANANA	125	192	402	394	54%	109%	105%
ORANGE	110	183	264	204	67%	45%	12%
MANGO	127	143	350	334	13%	145%	134%
LIME	85	100	624	503	18%	524%	403%
AVERAGE	106	152	494	389	44%	225%	157%
AVERAGE	105	136	301	275	29%	122%	103%

Source : Mission Rapid Market Survey  
Mercuriales des Legumes et des Fruits au Marche Central de  
N'Djamena, ONADEH

Because the above data is based on the respondent's recollection and on conversion into kg of inaccurate and highly variable measurement units (all by volume), the figures lack accuracy but nonetheless convey an overall picture of price formation. Other mitigating factors are the gray area between medium to small wholesalers who are also retailers and medium to large retailers who also wholesalers, as well as the fact that both wholesalers and retailers may obtain their supply directly from the producer at farmgate prices. It is also not clearly stated (although it is assumed) that purchase price by wholesalers refers to price inclusive of transport costs from the production area to the market.

However, from the above chart, it may be concluded that :

- margins tend to be considerably higher during periods of scarcity (rainy season);
- wholesale to retail margins of 30 to 50% reflect the larger volume handled and possibly a lower risk factor once the produce has reached the market;
- retailers operate with high margins ranging from 30% to 120% and over for relatively safe products; and up to and greater than 500% for the more perishable commodities, reflecting small volumes handled and

- compensation for greater risk of spoilage and losses;
- institutions, buying larger quantities, apparently benefit more from lower prices than the average consumer.

Price fluctuations on the N'Djamena retail market are acknowledged by all to be very great and abrupt, as reflected in the monthly retail price tables in APPENDIX F.7 It should be cautioned that the figures used in ONADEH's monthly price quotations are based on a single observation at the end of each month.

Prices appear to not only fluctuate on a seasonal basis, which for most crops mean high prices from June to December and low prices from January to March, but also on a daily or even hourly basis. These latter fluctuations are the result of individual unloads, with the first trucks (for which there is an assured market the same day) fetching a significantly higher price than late arrivals (this produce may have to be stored overnight or relocated by the purchaser). Such fluctuations are reflected in APPENDIX F.8 showing the daily price changes for bulk tomato delivered to the N'Djamena market.

This sensitivity to produce arrivals can be attributed to the lack of storage and conservation facilities available at the market.

#### F.6. SUMMARY OF MARKETING RELATED CONSTRAINTS

The main marketing related constraints may be summarized as follows :

- concentration of production over short periods of time;
- absence of market information, effective communication systems and resulting lack of coordination between the various elements of the marketing chain;
- absence of or inadequate produce conditioning and packing;
- lack of food conservation technologies and storage facilities;
- insufficient and unreliable transportation facilities;
- lack of operating capital at all levels of the marketing chain;
- limited management skills and experience, especially the lack of scales and weights and record-keeping.

ACDI PROJECT DESIGN MISSION - DEVELOPMENT OF MARKETING COOPERATIVES

ENQUETE PRODUCTION (FRUITS ET LEGUMES FRAIS)  
AIDE-MEMOIRE - PRODUCTEURS

REONDANT : Femme / Homme      Taille du ménage : H ... \ F ... \ E ...  
MEMBRES ACTIFS : Agric H ... \ F ... Non-agr H ... \ F ...

SURFACE DE L'EXPLOITATION (HA) : irrigué ... \ décrue ... \ ouadi ... \  
pluviale ...

PRINCIPALES CULTURES PLUVIALES :

liste

date semis ..... date récolte .....      temps des travaux .....  
Temps disponible pour maraichage de contre-saison ?

PRINCIPALES CULTURES IRRIGUEES :

CULTURES MARAICHERES :

	-----DATE-----		RDT	COUT PROD.	FARMGATE		METH.VENTE
	SEMIS	RECOLTE VENTE			MIN	MAX	
Tomate							
Oignon							
Aubergine							
Harricot							
Okra							
Carotte							
Laitue							
Epinards							
Piments							
.....							
.....							
.....							
.....							
.....							
Banane							
Orange							
Manguo							
Citron							
Dattes							
.....							
.....							

INTRANTS UTILISES (variétés/semences, prod.agro-chimiques)

PRATIQUES AGRICOLES (entretien, protection végétaux, récolte, pertes)

OUTILLAGE/EQUIPEMENT

STOCKAGE (installations, techniques, durée, pertes)

CONDITIONNEMENT/TRANSFORMATION (tri, calibrage, contrôle de qualité, pertes,  
sechage, conserverie)

**AUTO-CONSOMMATION (ménage, dons)**

**COMMERCIALISATION :**

Transport (options, coûts)

Débouchés (marchés local/régional/extérieur, institutions, intermédiaires  
production à contrat)

Moment de la vente (sur pied, à la récolte, différé)

Mode de paiement (cash, différé, avances/crédit, échanges)

Accès à l'information (prix, préférences acheteurs, concurrence)

**GROUPEMENT DE COMMERCIALISATION :** intérêt, ressources disponibles, adhésion  
en matière d'organisation (procédures, planification, gestion)

## ACDI PROJECT DESIGN MISSION - DEVELOPMENT OF MARKETING COOPERATIVES

ENQUETE DE MARCHÉ (FRUITS ET LEGUMES FRAIS)  
QUESTIONNAIRE - GROSSISTES

REPLI PAR : ..... TYPE : Gros \ Moyen \ +détail DATE : .....  
 REPONDANT : Femme / Homme FONCTION/POSITION : .....

1. FRUITS ET LEGUMES ACHETES LOCALEMENT (achats par semaine)  
 SAISON SECHE (Oct-Mai) SAISON DES PLUIES Jun-Sep)  
 Quantité/sem. FCFA/sem. Qté./sem. FCFA/sem.

Tomate	.....	.....	.....	.....
Oignon	.....	.....	.....	.....
Aubergine	.....	.....	.....	.....
Harricot	.....	.....	.....	.....
Okra	.....	.....	.....	.....
Carotte	.....	.....	.....	.....
Laitue	.....	.....	.....	.....
Epinards	.....	.....	.....	.....
Piments frais	.....	.....	.....	.....
Poivron	.....	.....	.....	.....
Poireau	.....	.....	.....	.....
Courge/ette	.....	.....	.....	.....
Pomme de terre	.....	.....	.....	.....
Banane	.....	.....	.....	.....
Orange	.....	.....	.....	.....
Mangue	.....	.....	.....	.....
Citron	.....	.....	.....	.....
Dattes	.....	.....	.....	.....
Avocat	.....	.....	.....	.....
Goyave	.....	.....	.....	.....

## 2. ACHATS :

FOURNISSEURS : Producteurs \ Producteur(s) à contrat \ Transporteur(s) \  
 Chez d'autre(s) grossiste(s) \ .....

Nombre de fournisseurs de même catégorie : .....

Toujours le(s) même(s) fournisseurs ? Toujours \ Souvent \ Parfois

Mode de PAYEMENT ? Comptant \ sur facture \ à ... jours \ Echange

Appéciation/améliorations requises : qualité .... \ présentation ....

éventail .... \ régularité ....

Avez-vous des difficultés d'approvisionnement ? Souvent \ Parfois \ jamais

- A quel moment surtout : Saison fraîche \ chaude \ pluies

- Pour quels produits en particulier ? .....

Montant total de vos achats (FCFA/sem) : S. fraîche....\chaude....\pluie...

## 3. VENTES :

A QUI ? Autres grossistes \ Détaillants \ Consommateurs

Nombre d'acheteurs de même type : ..... \ ..... \ .....

Toujours les mêmes acheteurs : Toujours \ souvent \ parfois \ jamais

Mode de paiement : Comptant \ Facture \ Crédit \ Echange \ .....

Principaux problèmes rencontrés : .....

.....



ACDI DESIGN MISSION - FRUIT & VEGETABLE MARKETING PILOT PROJECT, CHAD

ENQUETE DE MARCHÉ (FRUITS ET LEGUMES FRAIS)  
QUESTIONNAIRE - TRANSPORTEURS (fruits & légumes)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	COUNT	SUM	AVG		
MARCHÉ	Central		1	1						1	1	1	1	1	1		1	1	1					10				
	Bamba										1						1					1			3			
	Chobis																1								0			
	Cholera	1				1	1																		3			
	Hil				1																	1		1		3		
	Signal								1	1														1		3		
REPERMANT																												
Propriétaire				1	1	1	1		1	1	1	1		1		1	1					1			12			
propriétaire-opérateur		1											1											1	4			
opérateur			1					1							1				1	1				1	6			
agent																						1			0			
BASE D'OPERATION																												
N'Djamena		1		1	1	1	1			1	1	1	1	1	1	1				1	1				15			
Autre ville			1					1	1								1	1				1		1	7			
VEHICULES DANS L'ENTREPRISE :																												
Camions 20T			1	1	1										2			1		3		2			7	11		
Camions 5T						3						1	1											1	5	9		
Camionnettes		2						1														1			3	4		
Charrette/pousse-pousse							1			1	1					1	1								5	5		
Motos									1																1	1		
Velo									1				1												2	2		
CIRCUIT DE COLLECTE																												
1. SAISON SECHE (Oct-Mai)																												
Ville de départ																												
Abacha			1											1				1								3		
Chadra				1																						1		
Grubaya					1																					1		
Mousahiri																				1						1		
Keral		1				1						1	1													4		
Gavi							1																			1		
Goni									1																	1		
N'Djamena										1	1			1		1										4		
Nolia								1									1									2		
Koundoul																										1		
Mendolia																							1			1		
Baba																										1		
Sark																						1				1		
Nombre d'arrêts pour chargement		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	0	0.0		
Durée d'un circuit complet (heures)		60	24	18	3	5	4	4	2	3	12	12	2	32	4	1	60	12	40	1	60	2	21	429	20.4			
Nombre de circuits par semaine		6	1	3	3	6	7		14		6	7	20	1	14	7	2	15	1	18	1	14	19	146	7.7			
Chargement/voiture (plein=100%)																												
100%			1	1						1	1	1		1	1	1	1			1	1	1	1		13			
75%		1			1	1	1			1															6			
50%							1																		1			
Produits transportés																										1		
grains					1							1														2		

ACDI DESIGN MISSION - FRUIT & VEGETABLE MARKETING PILOT PROJECT, CHAD

ENQUETE DE MARCHÉ (FRUITS ET LEGUMES FRAIS)  
QUESTIONNAIRE - TRANSPORTERS (fruits & légumes)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	COUNT	SUM	AVG	
légumes	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1			1	1	1	19			
fruits																			1	1			2			
<b>2. SAISON DES PLUIES (Juin-Sep)</b>																										
Nombre d'arrêts pour chargement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	0	0.0
Durée d'un circuit complet (heures)	200	26	24	10	7	5	6	2	3	60	60	2	200	4	1	160	72			1		2	19	991	52.2	
Nombre de circuits par semaine	2	0.6	2	3	2	7		14		4	3	20		14	7	1	6	1	15	1	14	10	117	6.5		
Chargement/voyage (plein=100%)																										
100%	1	1	1					1			1	1			1	1			1	1	1	1	12			
75%				1	1	1			1															4		
50%							1																	1		
Produits transportés																										
grains												1													1	
légumes	1	1	1	1	1	1	1	1	1	1	1		1	1	1										10	
fruits														1					1	1					3	
<b>NATURE DE VOTRE COMMERCE</b>																										
Avez-vous acheté les produits transportés																										
toujours	1	1					1		1	1	1	1	1	1	1			1	1	1		1		14		
parfois																									0	
jamais			1	1	1	1		1							1						1		1		0	
<b>Si ACHETE de qui</b>																										
propre production																1									1	
producteur	1	1					1		1	1	1	1	1	1	1		1	1							12	
commerçant			1								1									1		1			4	
autre agent																							1	1	2	
<b>toujours des mêmes</b>																										
toujours																	1								1	
souvent									1	1	1		1												4	
parfois		1					1					1	1	1					1	1			1		0	
<b>comment payez-vous</b>																										
tout de suite	1	1					1		1	1	1	1	1	1	1				1	1		1			10	
partiel																									0	
plus tard																									0	
<b>à qui vendez-vous</b>																										
grossiste	1		1	1					1		1	1		1	1				1	1		1			11	
détaillants		1			1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	10	
consommateur																									1	
nombre d'acheteurs/chargement	0	0	0	6		5		3	10	0	25	10	2	0	2	0	6	0	0	0	0	15		19	100	
temps nécessaire pour tout vendre	5	300	10	4	4	2	5	1	2	2	7	12	1	300	1	1	300	72	300	2	200	3	22	1534	69.7	
<b>comment êtes-vous payé</b>																										
tout de suite	1		1	1	1	1		1	1	1	1	1	1	1	1				1	1					16	
partiel		1					1																		7	
plus tard														1			1								0	
<b>Si PAS ACHETE :</b>																										
prix de transport (FCFA/kg)	15	3.57	14.2	21.4	60		25	2.5				2.5		50			41.6	25						11	260.9	23.7
à qui livrez-vous																									0	
propriétaire accompagnant produit																									0	
toujours	1		1	1	1	1	1	1	1	1	1	1	1		1	1									14	

10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60  
61  
62  
63  
64  
65  
66  
67  
68  
69  
70  
71  
72  
73  
74  
75  
76  
77  
78  
79  
80  
81  
82  
83  
84  
85  
86  
87  
88  
89  
90  
91  
92  
93  
94  
95  
96  
97  
98  
99  
100  
101  
102  
103  
104  
105  
106  
107  
108  
109  
110  
111  
112  
113  
114  
115  
116  
117  
118  
119  
120  
121  
122  
123  
124  
125  
126  
127  
128  
129  
130  
131  
132  
133  
134  
135  
136  
137  
138  
139  
140  
141  
142  
143  
144  
145  
146  
147  
148  
149  
150  
151  
152  
153  
154  
155  
156  
157  
158  
159  
160  
161  
162  
163  
164  
165  
166  
167  
168  
169  
170  
171  
172  
173  
174  
175  
176  
177  
178  
179  
180  
181  
182  
183  
184  
185  
186  
187  
188  
189  
190  
191  
192  
193  
194  
195  
196  
197  
198  
199  
200  
201  
202  
203  
204  
205  
206  
207  
208  
209  
210  
211  
212  
213  
214  
215  
216  
217  
218  
219  
220  
221  
222  
223  
224  
225  
226  
227  
228  
229  
230  
231  
232  
233  
234  
235  
236  
237  
238  
239  
240  
241  
242  
243  
244  
245  
246  
247  
248  
249  
250  
251  
252  
253  
254  
255  
256  
257  
258  
259  
260  
261  
262  
263  
264  
265  
266  
267  
268  
269  
270  
271  
272  
273  
274  
275  
276  
277  
278  
279  
280  
281  
282  
283  
284  
285  
286  
287  
288  
289  
290  
291  
292  
293  
294  
295  
296  
297  
298  
299  
300  
301  
302  
303  
304  
305  
306  
307  
308  
309  
310  
311  
312  
313  
314  
315  
316  
317  
318  
319  
320  
321  
322  
323  
324  
325  
326  
327  
328  
329  
330  
331  
332  
333  
334  
335  
336  
337  
338  
339  
340  
341  
342  
343  
344  
345  
346  
347  
348  
349  
350  
351  
352  
353  
354  
355  
356  
357  
358  
359  
360  
361  
362  
363  
364  
365  
366  
367  
368  
369  
370  
371  
372  
373  
374  
375  
376  
377  
378  
379  
380  
381  
382  
383  
384  
385  
386  
387  
388  
389  
390  
391  
392  
393  
394  
395  
396  
397  
398  
399  
400  
401  
402  
403  
404  
405  
406  
407  
408  
409  
410  
411  
412  
413  
414  
415  
416  
417  
418  
419  
420  
421  
422  
423  
424  
425  
426  
427  
428  
429  
430  
431  
432  
433  
434  
435  
436  
437  
438  
439  
440  
441  
442  
443  
444  
445  
446  
447  
448  
449  
450  
451  
452  
453  
454  
455  
456  
457  
458  
459  
460  
461  
462  
463  
464  
465  
466  
467  
468  
469  
470  
471  
472  
473  
474  
475  
476  
477  
478  
479  
480  
481  
482  
483  
484  
485  
486  
487  
488  
489  
490  
491  
492  
493  
494  
495  
496  
497  
498  
499  
500  
501  
502  
503  
504  
505  
506  
507  
508  
509  
510  
511  
512  
513  
514  
515  
516  
517  
518  
519  
520  
521  
522  
523  
524  
525  
526  
527  
528  
529  
530  
531  
532  
533  
534  
535  
536  
537  
538  
539  
540  
541  
542  
543  
544  
545  
546  
547  
548  
549  
550  
551  
552  
553  
554  
555  
556  
557  
558  
559  
560  
561  
562  
563  
564  
565  
566  
567  
568  
569  
570  
571  
572  
573  
574  
575  
576  
577  
578  
579  
580  
581  
582  
583  
584  
585  
586  
587  
588  
589  
590  
591  
592  
593  
594  
595  
596  
597  
598  
599  
600  
601  
602  
603  
604  
605  
606  
607  
608  
609  
610  
611  
612  
613  
614  
615  
616  
617  
618  
619  
620  
621  
622  
623  
624  
625  
626  
627  
628  
629  
630  
631  
632  
633  
634  
635  
636  
637  
638  
639  
640  
641  
642  
643  
644  
645  
646  
647  
648  
649  
650  
651  
652  
653  
654  
655  
656  
657  
658  
659  
660  
661  
662  
663  
664  
665  
666  
667  
668  
669  
670  
671  
672  
673  
674  
675  
676  
677  
678  
679  
680  
681  
682  
683  
684  
685  
686  
687  
688  
689  
690  
691  
692  
693  
694  
695  
696  
697  
698  
699  
700  
701  
702  
703  
704  
705  
706  
707  
708  
709  
710  
711  
712  
713  
714  
715  
716  
717  
718  
719  
720  
721  
722  
723  
724  
725  
726  
727  
728  
729  
730  
731  
732  
733  
734  
735  
736  
737  
738  
739  
740  
741  
742  
743  
744  
745  
746  
747  
748  
749  
750  
751  
752  
753  
754  
755  
756  
757  
758  
759  
760  
761  
762  
763  
764  
765  
766  
767  
768  
769  
770  
771  
772  
773  
774  
775  
776  
777  
778  
779  
780  
781  
782  
783  
784  
785  
786  
787  
788  
789  
790  
791  
792  
793  
794  
795  
796  
797  
798  
799  
800  
801  
802  
803  
804  
805  
806  
807  
808  
809  
810  
811  
812  
813  
814  
815  
816  
817  
818  
819  
820  
821  
822  
823  
824  
825  
826  
827  
828  
829  
830  
831  
832  
833  
834  
835  
836  
837  
838  
839  
840  
841  
842  
843  
844  
845  
846  
847  
848  
849  
850  
851  
852  
853  
854  
855  
856  
857  
858  
859  
860  
861  
862  
863  
864  
865  
866  
867  
868  
869  
870  
871  
872  
873  
874  
875  
876  
877  
878  
879  
880  
881  
882  
883  
884  
885  
886  
887  
888  
889  
890  
891  
892  
893  
894  
895  
896  
897  
898  
899  
900  
901  
902  
903  
904  
905  
906  
907  
908  
909  
910  
911  
912  
913  
914  
915  
916  
917  
918  
919  
920  
921  
922  
923  
924  
925  
926  
927  
928  
929  
930  
931  
932  
933  
934  
935  
936  
937  
938  
939  
940  
941  
942  
943  
944  
945  
946  
947  
948  
949  
950  
951  
952  
953  
954  
955  
956  
957  
958  
959  
960  
961  
962  
963  
964  
965  
966  
967  
968  
969  
970  
971  
972  
973  
974  
975  
976  
977  
978  
979  
980  
981  
982  
983  
984  
985  
986  
987  
988  
989  
990  
991  
992  
993  
994  
995  
996  
997  
998  
999  
1000

ACDI DESIGN MISSION - FRUIT & VEGETABLE MARKETING PILOT PROJECT, CHAD

ENQUETE DE MARCHÉ (FRUITS ET LÉGUMES FRAIS)  
QUESTIONNAIRE - TRANSPORTIENS (fruits & légumes)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	COUNT	SUM	AVG
souvent																			1	1	1	1	4		
parfois		1												1			1	1					4		
<b>QUE FAUDRAIT-IL AMELIORER</b>																									
route	1	1		1		1		1			1	1		1			1	1	1	1	1	1	14		
organiser producteurs	1	1		1			1										1	1	1	1	1	1	4		
organiser production	1							1															2		
organiser vendeurs				1																			1		
améliorer qualité produits			1			1		1															3		
fixation des prix					1		1																2		
infrastructure de marché										1													1		
coûts d'opération/transport																		1	1		1		3		
régularité de la production															1								1		

16

16

ACDI MISIOM MISSION - FRUIT & VEGETABLE MARKETING PILOT PROJECT, CHAD

ENQUETE DE MARCHÉ (FRUITS ET LEGUMES FRAIS)  
QUESTIONNAIRE - GROSISTES

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	COUNT	MIN	MAX	APC	
<b>EMPLI PAR</b>	A	A	B	B	B	B	B	B	B	B	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y					
<b>TYPE : Gros</b>																									
Boyon	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10	
-détail	1											1	1	1	1	1					1			14	
<b>REPERTOIRE</b>																									
Fruits	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	7	
Legumes																									13
<b>2. ACHETS :</b>																									
<b>FOURNISSEURS</b>																									
Producteurs																									
Producteur(s) à contrat	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	11	
Transporteur(s)																									12
Chez d'autres grossistes(s)																									13
Autres																									2
<b>Nombre de fournisseurs</b>																									
Producteurs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
Producteur(s) à contrat																									13
Transporteur(s)																									9
Chez d'autres grossistes(s)																									9
<b>Tousjours les mêmes</b>																									4
Tousjours																									0
Souvent																									4
Parfois	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
<b>Modes de PAIEMENT</b>																									
Comptant	1																								17
sur facture																									1
à .... jours																									8
Echange																									0
<b>Améliorations requises</b>																									0
qualité																									0
présentation																									0
détail																									0
régularité																									0
<b>Difficultés d'approvisionnement</b>																									0
Souvent																									7
Parfois	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	13
jamais																									1
<b>À quel Saison</b>																									0
fraîche																									0
chaude																									0
pluie	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14
<b>Pour quels produits</b>																									0
<b>Montant des achats (FCFA/sem)</b>																									0
S.fraîche																									0
pluie																									0
<b>3. VENTES :</b>																									
<b>À QUI</b>																									
Autres grossistes																									0
Détailants	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	17
Consommateurs	1																								0

ACDI DIRECTION MISSION - FRUIT & VEGETABLE MARKETING PILOT PROJECT, CHAD

REVENUS DE MARCHÉ (FRUITS ET LEGUMES FRAIS)  
QUESTIONNAIRE - GROSSETES

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	COUNT	MIN	MAX	AVG	
Nombre d'acheteurs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20				
Toujours les mêmes																									
Toujours souvent												1									1			0	
parfois	1	1									1	1	1	1	1	1	1		1	1	1			2	
jamais			1	1	1	1	1	1	1	1							1	1	1					11	
Modes de paiement																									
Comptant	1		1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1			10	
Facture		1																						1	
Crédit							1																	3	
Echange																	1			1				0	
Principaux problèmes																									
livraisons (roustes/vehicules)	1	1					1	1	1		1					1	1							8	
stockage au marche		1					1			1							1							4	
conservation des produits									1			1		1	1	1	1			1				7	
etat du marche																								0	
disponibilité en s.plate			1	1						1			1						1			1		6	
fluctuations des prix						1				1														2	
qualite des produits																								0	
avents					1		1					1								1	1			5	
<b>5. QUE FERAIT-IL AMELIORER AUX PRODUITS LOCALS ?</b>																									
La qualité des produits (fraicheur)																									
beaucoup	1				1																				2
un peu																									0
c'est bien		1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10
La choix (quantité de produits)																									
beaucoup					1				1																2
un peu			1	1		1				1	1					1	1	1			1			9	
c'est bien	1	1					1	1			1	1	1	1	1				1					9	
La régularité des disponibilités																									
beaucoup	1	1	1	1		1		1	1	1	1					1	1	1	1	1	1	1	1	15	
un peu					1		1					1		1	1									5	
c'est bien																								0	
Les prix																									
beaucoup			1			1	1	1	1	1					1	1	1	1	1	1	1	1	1	10	
un peu	1	1		1	1		1		1		1	1	1											9	
c'est bien													1											1	
Le marché (installations)																									
beaucoup				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	17	
un peu																								0	
c'est bien																								0	
Autres											4		6	4	7			6	6	6				7	
<b>1. SALONS ENCH (Oct-Mai)</b>																									
QUANTITE																									
Tomate			1200									80									2	80	1200	640	
Oignon		800					800			9120			1120					1040			5	800	9120	2576	
Asperges	560																				1	560	560	560	
Haricots																								0	
Autre			1760	2100			2400							1200						100	5	100	2400	1512	

ACDI DESIGN BLESSON - FRUIT & VEGETABLE MARKETING PILOT PROJECT, CHAD

ENQUETE DE MARCHÉ (FRUITS ET LEGUMES FRAIS)  
QUESTIONNAIRE - GROSSISTES

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	COUNT	MIN	MAX	AVC	
Carotte																					0				
Laitue			110									400									2	110	400	295	
Epinards																					0				
Plante fraie																					2	120	600	360	
Poivre															600						120				
Poitron																					0				
Courgette					420			560													2	420	560	490	
Pomme de terre										3500			200					1500			3	200	3500	1733.3	
Banane	360															1200					2	360	1200	780	
Orange																					0				
Pample	600				6000																3	600	20000	9066.6	
Citron																20000					0				
Battar									040										400		2	400	040	620	
Avocat																					0				
Cayenne																					0				
All		000					000				9600			505						640	5	600	9600	2341	
Oseille				4000																	1	4400	4400	4400	
Autre feuilles																					0				
NET SEASON PRICE																					0				
Tomate			42000									10000									2				
Oignon		85000					50000				790000			110000						90000	5				
Aubergine	30500																				1				
Haricot																					0				
Autre				100000	52500			160000							125000					17000	5				
Carotte																					0				
Laitue			13600									60000									2				
Epinards																					0				
Plante fraie																					0				
Poivre															70000					14000	2				
Poitron																					0				
Courgette					25200			35000													2				
Pomme de terre										210000			40000								140000	3			
Banane	50000															180000					2				
Orange																					0				
Pample	25000					670000															3				
Citron																1200000					0				
Battar								230000													2				
Avocat																				100000	0				
Cayenne																					0				
All		90000					75000				1000000			113000						72000	5				
Oseille				196000																	1				
	127500	175000	55600	376000	77700	670000	125000	195000	230000	210000	2590000	50000	40000	223000	195000	1300000	140000	100000	162000	31000		31000	2500000	350000	
2. SAISON DES PLUIES (Jan-Sep)																									
QUANTITE																									
Tomate			600									240									2	240	600	420	
Oignon		560					490				6400				560					480	5	480	6400	1690	
Aubergine	560																				1	560	560	560	

Source : Mission, Rapid Survey

2025 RELEASE UNDER E.O. 14176

ACDI DESIGN MISSION - FRUIT & VEGETABLE MARKETING PILOT PROJECT, CHAD

ENQUETE DE MARCHÉ (FRUITS ET LEGUMES FRAIS)  
QUESTIONNAIRES - GROSSELISTES

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	COUNT	MIN	MAX	APG	
Haricot																					0				
Okra				900	600			200							1000						100	5	100	1000	560
Carotte																						0			
Laitue												200										1	200	200	200
Epinards																						0			
Piments frais															300						60	2	60	300	100
Pailron																						0			
Pailron																						0			
Courya/otta					700			320														2	320	700	510
Pomme de terre												200										2	200	1000	600
Banane																800						1	800	800	800
Orange																						0			
Mangue	400																					2	400	20000	16200
Citron																20000						0			
Battas									420													2	420	640	530
Avoct																						0			
Goyave																						0			
All		400					320				8000			390								5	320	8000	1910
Onion				3200																		1	3200	3200	3200
WET SEASON PRICE																									
Tomate			30000									23000										2			
Oignon		61250					42000				800000			60000							60000	5			
Aubergine	12000																					1			
Haricot																						0			
Okra				90000	35000			10000							50000							5	9000		
Carotte																						0			
Laitue												20000										1			
Epinards																						0			
Piments frais															35000							2	6000		
Pailron																						0			
Pailron																						0			
Courya/otta					65500			16000														2			
Pomme de terre												32000										2		70000	
Banane																100000						1			
Orange																						0			
Mangue	65000																					2			
Citron															1000000							0			
Battas								157500														2		220000	
Avoct																						0			
Goyave																						0			
All		55000					40000				2000000			8000								5		72000	
Onion				100000																		1			
AVERAGE CFI/1/5	107000	116250	30000	190000	80500	0	86000	26000	157500	0	2000000	43000	32000	60000	85000	1900000	70000	220000	140000	15000			0	2000000	308512
WET SEASON																									
Tomate			35									125													
Oignon		106					63				80			90											
Aubergine																									67

ACDI DESIGN MISSION - FRUIT & VEGETABLE MARKETING PILOT PROJECT, CMAO

ENQUETE DE MARCHÉ (FRUITS ET LEGUMES FRAIS)  
QUESTIONNAIRE - GROSSISTES

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	COUNT	MIN	MAX	AVG
Barriout																								
Okra				102	25			67							104						170			
Carotte																								
Laitue			124									83												
Epinards																								
Piments frais															117						117			
Poivron																								
Poitron																								
Courge/ette					60			63																
Pomme de terre										60			200								93			
Banane	150																							
Orange																					150			
Banane	80						99														60			
Citron																								
Bettes										274														
Avocat																					250			
Goyave																								
All		100					100				100			193										
Oseille				44																				
KEY SEAGONS																								
Tomate			57										96											
Oignon		109						86			125			107										
Aubergine	75																							
Barriout																								
Okra				100	50			50							50									90
Carotte																								
Laitue													100											
Epinards																								
Piments frais																								
Poivron															117									100
Poitron																								
Courge/ette					65			50																
Pomme de terre													160								70			
Banane																					125			
Orange																								
Banane	163																				90			
Citron																								
Bettes										375														
Avocat																								
Goyave																								
All		130					130					250			21									
Oseille				31																				150

11

ACDI DESIGN DESIGN - FRUIT & VEGETABLE MARKETING PILOT PROJECT, CHAD

MARKET DE MARCHÉ (FRUITS ET LEGUMES FRAIS)

QUESTIONNAIRE - DÉTAILLÉS

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 COMPT HIB MAX AVG STD

ACDI PROJECT DESIGN DESIGN - DEVELOPMENT OF MARKETING COOPERATIVES

MARKET DE MARCHÉ (FRUITS ET LEGUMES FRAIS)

QUESTIONNAIRE - DÉTAILLÉS

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 COMPT HIB MAX AVG STD

TYPE		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	COMPT	HIB	MAX	AVG	STD
REPOSANT	Grand				1		1	1					1	1					1				6	1	1	1	0
	Moyen	1									1	1									1	1		5			
	Petit		1	1		1			1	1					1	1	1			1			9				
MARCHÉ	I	1	1			1		1	1	1	1			1	1	1			1		1		10				
	Central		1		1	1	1	1	1			1	1	1	1	1			1		1		11				
	Bambo	1		1						1	1	1	1	1	1	1	1		1	1	1	1	14				
ACHATS																							7				
FOURNISSEURS																											
Producteurs							1				1							1				1		4			
Producteur(s) à contrat		1	1	1	1			1		1		1	1	1	1	1	1					1	14				
Transporteur(s)																							0				
Grossiste(s)																							0				
autres détaillants																							0				
Nombre de fournisseurs		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Toujours (ou) souvent																							21				
Souvent				1																			0				
Parfois		1	1		1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				1
Rien du TOUT																							19				
Comptant		1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				20
sur facture					1																		1				
après				1		1															1		3				
Appréciation/amblioration requises																											
qualité		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2				21
présentation									2														1				
détail																							0				
régularité																							0				
Sont-elles des difficultés d'approvisionnement																											
Souvent		1		1			1	1			1																5
Parfois			1		1				1	1		1	1	1	1	1	1	1	1	1	1	1	1				13
Jamais						1																					2
À quel moment surtout																1											
Saison fraîche		1	1					1	1						1		1				1		0				
chaude		1	1		1	1	1																1				8
pluie		1		1	1		1	1			1	1	1	1						1	1	1	7				
Pour quels produits en particulier																											
Montant total de vos achats (FCFA/ann)																											
Saison sèche		09000	26250	30000	31500	17000	92500	17500	31500	12000	81000	65600	72000	53500	20000	50000	22250	34500	15000	306000	17000	17250	21	12000	306000	56007	77760
pluie		93000	8000	6000	19000	32500	35000	100000	70000	6000	55500	26200	30000	26000	15000	43750	16250	21700	9500	84000	2000	5400	21	2000	100000	33961	29830
VENTES :																											
À QUI																											
Autres détaillants								1																			
Comme clients		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				1
OU VENIR VOUS																											

Source : Mission, Rapid Survey.

Appendix 5.1 5.1

ACDI BUSINESS MISSION - FOOD & VEGITABLE MARKETING PILOT PROJECT, CHAD

ENQUÊTE DE MARCHÉ (POINTS ET LIGNES TRAI)  
QUESTIONNAIRE - DÉTAILLÉ

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	COUNT	MIN	MAX	AVG	STD	
ce marché	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	21					
itindrent																						0					
décharge de quartier					1																	1					
Nombre d'acheteurs par jour	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	21					
Toujours les mêmes acheteurs																						0					
Toujours																						0					
souvent																						0					
parfois	1	1	1	1				1	1				1	1	1	1	1					11					
jamais					1	1	1			1	1	1							1	1	1	10					
Modes de paiement																											
Comptant	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	20					
Crédit																						0					
Echange																						0					
Principaux problèmes																											
détérioration des produits	1		1			1													1			4					
absence de stockage au marché	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	19					
absence de crédit/cap d'ops	1		1	1																		3					
absence d'équipement d'atalla	1	1		1		1			1						1							6					
reavitaillement irrégulier				1	1														1			3					
coût de transport élevé		1					1	1		1	1		1	1		1					1	10					
accidents		1	1							1											1	1	1	6			

1. SAISON SECHE (Oct-Mai)

Tomate																420	120					2	120	420	270	150
Oignon			80																			1	80	80	80	0
Aubergine										540			120									2	120	540	340	220
Haricot									80								20				50	3	20	80	50	24.494
Okra												700				90						2	90	700	395	305
Carotte						100								80		70						3	70	100	96.644	30.912
Laitue			200															60	40			3	60	200	120	113.13
Epinards												100									50	2	50	100	95	45
Piments frais						600								27	60	60						4	27	600	151.75	109.87
Pailon																						0				
Pailon																						0				
Carotte/okra										600		540									200	3	200	540	413.33	154.34
Fenne de terre								200														1	200	200	200	0
Banane	100																				100	2	100	100	100	0
Orange		100			20							80	100									5	20	100	80	53.045
Orange	420																				2000	2	420	2000	1610	1190
Citrus					200																	1	200	200	200	0
Battar							100															1	100	100	100	0
Avocat										200												1	200	200	200	0
Goyave		160													320							2	160	320	240	80
All					200																	1	200	200	200	0
Oseille																						0				
Okra feuilles																						0				
Tomate																24500	10000					2	10000	24500	17250	7250
Oignon					7500																	1	7500	7500	7500	0

ACDI DESIGN MISSION - FRUIT & VEGETABLE MARKETING PILOT PROJECT, CHAD

REVENUE DE MARCHÉ (FRUITS ET LÉGUMES FRAIS)  
QUESTIONNAIRE - DÉTAILLÉ

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	COUNT	MIN	MAX	AVG	STD	
Aubergine									63000			7500										2	7500	63000	35250	27750	
Haricot								12000														3	5000	12000	7333.3	3299.8	
Œtra											56000						8750	5000				5000	3	8750	56000	32375	23625
Carotte					17500									8500			7500					3	7500	17500	11166.6	4096.9	
Laitue		30000																				3	5000	30000	13333.3	11785.5	
Épinards										5600												2	2000	5600	4200	1600	
Piments frais					75000									4000	18000	6000						4	4000	75000	23750	29667.5	
Poivron																						0					
Pâtisson																						0					
Courgette										10000		17500										3	15000	10000	16433.3	1312.3	
Pomme de terre								31500														1	31500	31500	31500	0	
Banane	33000																					2	33000	36000	34500	1500	
Orange		12250			2000						16000	36000										5	2000	36000	15060	10975.5	
Mangue	56000																					2	56000	350000	203000	147000	
Citron					15000																	1	15000	15000	15000	0	
Battar							17500															1	17500	17500	17500	0	
Avocat										60000												1	60000	60000	60000	0	
Goyave		24000												40000								2	24000	40000	32000	8000	
Ail				24000																		1	24000	24000	24000	0	
Oseille																						1	24000	24000	24000	0	
<b>2. SAISON DES PLUIES Juin-Sep)</b>	<b>89000</b>	<b>36250</b>	<b>30000</b>	<b>31500</b>	<b>17000</b>	<b>92500</b>	<b>17500</b>	<b>31500</b>	<b>12000</b>	<b>81000</b>	<b>65600</b>	<b>72000</b>	<b>53500</b>	<b>20000</b>	<b>50000</b>	<b>22250</b>	<b>34500</b>	<b>15000</b>	<b>306000</b>	<b>17000</b>	<b>17250</b>	<b>21</b>	<b>12000</b>	<b>306000</b>	<b>56007.7</b>	<b>77768.8</b>	
Tomate			50														150	50				3	50	150	83.333	47.140	
Oignon				80																		1	80	80	80	0	
Aubergine										320				80								2	80	320	200	120	
Haricot									60								20				30	3	20	60	30	6.1649	
Œtra												150				60						2	60	150	105	45	
Carotte					200									15		18						3	15	200	77.666	86.511	
Laitue																				25		1	25	25	25	0	
Épinards										9												2	9	18	13.5	4.5	
Piments frais					200									10	25	12						4	10	200	61.75	80.026	
Poivron																						0					
Pâtisson																						0					
Courgette										200				320								2	200	320	200	60	
Pomme de terre								200														1	200	200	200	0	
Banane	180																					2	180	420	300	120	
Orange					25							120	60									4	15	120	55	41.079	
Mangue	420																					1	420	420	420	0	
Citron					300																	1	300	300	300	0	
Battar							400															1	400	400	400	0	
Avocat										100												1	100	100	100	0	
Goyave		80														320						2	80	320	200	120	
Ail				80																		1	80	80	80	0	
Oseille																						0					
Tomate			6000														17500	6000				3	6000	17500	9033.3	5421.1	
Oignon				9000																		1	9000	9000	9000	0	
Aubergine									40000					6000								2	6000	40000	27000	21000	

ACDI DESIGN MISSION

Source : Mission, Rapid Survey.

ACDI DESIGN MISSION - FRUIT & VEGETABLE MARKETING PILOT PROJECT, CHAD

MOISSE DE MARCHÉ (FRUITS ET LEGUMES FRAIS)  
 QUESTIONNAIRE - DÉTAILLÉ

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	COURT	MIN	MAX	AVG	STD
Haricot								6000									4200				1200	3	1200	6000	3000	1979.6
Okra											12000					6000						2	6000	12000	9000	3000
Carotte					10000									7500		8500						3	7500	10000	8446.6	1027.4
Laitue											1200							3500				1	3500	3500	3500	0
Épinards																				2400		2	1200	2400	1800	600
Piments frais					25000									1500	3750	1750						4	1500	2750	8000	9853.6
Poisson																						0				
Poisson																						0				
Courgette										7500			10000									2	7500	10000	10750	3250
Pomme de terre							50000															1				
Banane	13000							20000												04000		3	24000	80000	47000	26419.
Orange				2500							10000	12000									4200	4	2500	10000	9175	6220.3
Orange	60000																					1	60000	60000	60000	0
Citrus				30000																		1	30000	30000	30000	0
Bettes						100000																1	100000	100000	100000	0
Avocat											25000											1	25000	25000	25000	0
Goyave		8000													40000							2	8000	40000	20000	16000
All				10000																		1	10000	10000	10000	0
Oseille																						0				
	93000	8000	6000	19000	32500	35000	100000	70000	6000	55500	26200	30000	26000	15000	43750	16250	21700	9500	84000	2400	5400	21	2400	100000	33961.	29030.

SAISON SECHE (CFA/TON)

Tomate																		50	83						70.833	
Oignon				94																						93.75
Aubergine										113				63												
Haricot									150									250			100					
Okra												80					97									80.611
Carotte						125								106		107										
Laitue			107															125	125							119.04
Épinards											40															
Piments frais					156									140	167	150										155.26
Poisson																										
Poisson																										
Courgette										30			31								75					
Pomme de terre								150																		157.5

Banane	183																									191.66
Orange		123			140							200	200								200					181.66
Orange	133																									129.16
Citrus				75																						75
Bettes							175																			
Avocat											300															
Goyave		150																								
All				100																						
Oseille																										

SAISON DES PLUIES (CFA/TON)

Tomate		120																								119
Oignon				113																						113
Aubergine										150					75											
Haricot																										210
																										40

90

ACDI DESIGN MISSION - FRUIT & VEGETABLE MARKETING PILOT PROJECT, CHAD

ENQUETE DE MARCHÉ (FRUITS ET LEGUMES FRAIS)  
QUESTIONNAIRE - DETAILLÉ

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	COMPT	MIN	MAX	AVG	STD	
Other												88				100										98	
Carotte						50								500		472											100
Laitue																		140									140
Epinards											133										133						143
Piments frais						125								150	150	146											143
Pailron																											143
Poivron																											143
Poivron																											143
Courge/ette										31			44														143
Pomme de terre								270																			270
Banane	183																										192
Orange					100							150	200							200							183
Mangue	143																										143
Citron					100																						143
Battes																											100
Avocat																											100
Goyave		100																									100
All					125																						100
Guaillo																											100

01

**ENQUETE DE MARCHÉ (FRUITS ET LEGUMES FRAIS)  
QUESTIONNAIRE - INSTITUTIONS**

	1	2	3	4	5	6	7	8	COUNT	MIN	MAX	AVG	SUM
REPLI PAR INSTITUTION REPOUDANT ?	K	A	A	A	B	B	T	T	8	0	0	0	0
H	1	1	1	1	1	1	1	1	8				
FOCTION/POSITION													
Propriétaire		1	1	1			1	1	5				
Gerant					1	1			2				
Cuisinier	1								1				
Approvisionnement													
marché	1	1	1	1	1	1	1	1	8				
supermarché									0				
grossiste(s)					1		1		2				
producteur(s) à contrat									0				
Nombre de fournisseurs	5	+	+	+	+	+	+	+	8				
Toujours les mêmes													
Toujours	1								1				
Souvent							1	1	2				
Parfois		1	1	1	1	1			5				
Mode de paiement													
Comptant	1	1		1	1	1	1	1	7				
sur facture			1						1				
à .... jours	1						1		2				

**5. QUE FAUDRAIT-IL AMELIORER AUX PRODUITS LOCAUX ?**

**La qualité des produits (fraicheur)**

beaucoup	1			1		1			3				
un peu			1		1			1	3				
c'est bien		1					1		2				

**Le choix (gamme de produits)**

beaucoup									0				
un peu		1		1		1	1		4				
c'est bien	1		1		1			1	4				

**La régularité des disponibilités**

beaucoup	1					1	1	1	4				
un peu			1	1	1				3				
c'est bien		1							1				

**Les prix**

beaucoup					1		1	1	3				
un peu	1	1		1		1			4				
c'est bien			1						1				

**Le marché (installations)**

beaucoup					1	1	1	1	4				
un peu		1	1						2				
c'est bien				1					1				

**1. SAISON SECHE (Oct-Mai)**

**QUANTITY**

Tomate	60	8	12	24	12	15	12	12	8	8	60	19.375	155
Oignon	60	12	14	16		10	12	6	7	6	60	18.571	130
Aubergine	30	160	200				240		4	30	200	177.5	710

92

**ENQUETE DE MARCHÉ (FRUITS ET LEGUMES FRAIS)  
QUESTIONNAIRE - INSTITUTIONS**

	1	2	3	4	5	6	7	8	COUNT	MIN	MAX	AVG	SUM
Harricot	80		7				9		3	7	80	32	96
Okra			60	60		4	60	8	5	4	60	38.4	192
Carotte	60	4.5	3.5	2.4			2.8		5	2.4	60	14.64	73.2
Laitue	35	8	6	35	30	12	8	30	8	6	35	20.5	164
Epinards	30								1	30	30	30	30
Piments frais		2	2	3		1	2	5	6	1	5	2.5	15
Poivron	40								1	40	40	40	40
Poitreau	7								1	7	7	7	7
Courge/ette	30								1	30	30	30	30
Pomme de terre	100								1	100	100	100	100
Banane		160	140	25	22	5	120	12	7	5	160	69.142	484
Orange	125					12.5		25	3	12.5	125	54.166	162.5
Mangue	30		105		30	22	120	10	6	10	120	52.833	317
Citron	50		14			3	15	0.5	5	0.5	50	16.5	82.5
Dattes									0				
Avocat									0				
Goyave	7		140				120		3	7	140	89	267
Ail									0				
Oseille									0				
Okra feuilles									0				
<b>VALUE</b>													
Tomate	15000	1600	2400	7000	4000	3500	2600	3500	8	1600	15000	4950	39600
Oignon	11000	2100	2450	2800		1800	2000	900	7	900	11000	3292.8	23050
Aubergine	3600	11500	17500				16000		4	3600	17500	12150	48600
Harricot	56000		7200				9500		3	7200	56000	24233.	72700
Okra			17500	17500		1000	17500	2000	5	1000	17500	11100	55500
Carotte	60550	8500	7500	6000			7500		5	6000	60550	18010	90050
Laitue	8750	1800	1500	10000	7000	3000	1800	7500	8	1500	10000	5168.7	41350
Epinards	10500								1	10500	10500	10500	10500
Piments frais		1000	1000	1500		500	1000	2500	6	500	2500	1250	7500
Poivron	30000								1	30000	30000	30000	30000
Poitreau	8400								1	8400	8400	8400	8400
Courge/ette	7500								1	7500	7500	7500	7500
Pomme de terre	25000								1	25000	25000	25000	25000
Banane		48000	42000	8500	7000	1600	40000	4000	7	1600	48000	21585.	151100
Orange	31250					1750		6600	3	1750	31250	13200	39600
Mangue	7200		26250		8000	5000	27500	2500	6	2500	27500	12741.	76450
Citron	25000		7500			1350	7250	200	5	200	25000	8260	41300
Dattes									0				
Avocat									0				
Goyave	2800		42000				35000		3	2800	42000	26600	79800
Ail									0				
Oseille									0				
<b>TOTAL</b>	<b>302550</b>	<b>74500</b>	<b>174800</b>	<b>53300</b>	<b>26000</b>	<b>19500</b>	<b>167650</b>	<b>29700</b>	<b>8</b>	<b>19500</b>	<b>302550</b>	<b>106000</b>	<b>848000</b>

**2. SAISON DES PLUIES (Jun-Sep)****QUANTITE**

Tomate	30	10		5	7	7	2	6.5	7	2	30	9.6428	67.5
--------	----	----	--	---	---	---	---	-----	---	---	----	--------	------

ENQUETE DE MARCHÉ (FROITS ET LEGUMES FRAIS)  
QUESTIONNAIRE - INSTITUTIONS

	1	2	3	4	5	6	7	8	COUNT	MIN	MAX	AVG	SUM
Oignon	60	14	14	16		10	6	6	7	6	60	18	126
Aubergine		120	240				160		3	120	240	173.33	520
Harricot			7				7		2	7	7	7	14
Okra			30	35		1.5	20	3	5	1.5	35	17.9	89.5
Carotte		3.5	3.5	3			3.5		4	3	3.5	3.375	13.5
Laitue				15	8	10		8	4	8	15	10.25	41
Epinards									0				
Piments frais		1	1	1		0.5	1.5	3	6	0.5	3	1.3333	8
Poivron									0				
Poitreau									0				
Courge/ette									0				
Pomme de terre	100								1	100	100	100	100
Banane		75		14	8	6		6	5	6	75	21.8	109
Orange	120					5		22	3	5	120	49	147
Mangue	35					10			2	10	35	22.5	45
Citron	50		15			3	10	1	5	1	50	15.8	79
Dattes									0				
Avocat									0				
Goyave									0				
Ail									0				
Oseille									0				
<b>VALEUR</b>													
Tomate	30000	2000		5000	7000	3500	750	6500	7	750	30000	7821.4	54750
Oignon	18000	2650	2450	2800		2500	1250	1500	7	1250	18000	4450	31150
Aubergine		9000	18000				10000		3	9000	18000	12333.	37000
Harricot			6000				5000		2	5000	6000	5500	11000
Okra			10000	11000		500	6500	1000	5	500	11000	5800	29000
Carotte		7500	7500	6000			7500		4	6000	7500	7125	28500
Laitue				7500	2325	5000		2500	4	2325	7500	4331.2	17325
Epinards									0				
Piments frais		500	500	500		200	750	1500	6	200	1500	658.33	3950
Poivron									0				
Poitreau									0				
Courge/ette									0				
Pomme de terre	30000								1	30000	30000	30000	30000
Banane		30000		5500	3000	2400		2400	5	2400	30000	8660	43300
Orange	25000					1000		4500	3	1000	25000	10166.	30500
Mangue	12000					4000			2	4000	12000	8000	16000
Citron	25000		7500			1400	5500	500	5	500	25000	7980	39900
Dattes									0				
Avocat									0				
Goyave									0				
Ail									0				
Oseille									0				
<b>TOTAL</b>	<b>140000</b>	<b>51650</b>	<b>51950</b>	<b>38300</b>	<b>12325</b>	<b>20500</b>	<b>37250</b>	<b>20400</b>	<b>8</b>	<b>12325</b>	<b>140000</b>	<b>46546.</b>	<b>372375</b>
<b>CFA/KG S.SECHE</b>													
Tomate	250	200	200	292	333	233	217	292					

Source : Mission, Rapid Survey.

94

**ENQUETE DE MARCHÉ (FRUITS ET LEGUMES FRAIS)  
QUESTIONNAIRE - INSTITUTIONS**

	1	2	3	4	5	6	7	8	COUNT	MIN	MAX	AVG	SUM
Oignon	183	175	175	175		100	167	150					
Aubergine	120	72	63				67						
Harricot	700		1029				1056						
Okra			292	292		250	292	250					
Carotte	1009	1889	2143	2500			2679						
Laitue	250	225	250	286	233	250	225	250					
Epinards	350												
Piments frais		500	500	500		500	500	500					
Poivron	750												
Poitreau	1200												
Courge/ette	250												
Pomme de terre	250												
<b>Banane</b>		300	300	340	318	320	333	333					
<b>Orange</b>	250					140		264					
<b>Mangue</b>	240		250		267	227	229	250					
<b>Citron</b>	500		536			450	483	400					
<b>Dattes</b>													
<b>Avocat</b>													
<b>Goyave</b>	400		300				292						
<b>Ail</b>													
<b>Oseille</b>													
<b>CFA/KG S. PLAIN</b>													
<b>Tomate</b>	1000	200		1000	1000	500	375	1000					
<b>Oignon</b>	300	189	175	175		250	200	250					
<b>Aubergine</b>		75	75				63						
<b>Harricot</b>			857				714						
<b>Okra</b>			333	314		333	325	333					
<b>Carotte</b>		2143	2143	2000			2143						
<b>Laitue</b>				500	291	500		313					
<b>Epinards</b>													
<b>Piments frais</b>		500	500	500		400	500	500					
<b>Poivron</b>													
<b>Poitreau</b>													
<b>Courge/ette</b>													
<b>Pomme de terre</b>	300												
<b>Banane</b>		400		393	375	400		400					
<b>Orange</b>	200					200		205					
<b>Mangue</b>	343					400							
<b>Citron</b>	500		500			467	550	500					
<b>Dattes</b>													
<b>Avocat</b>													
<b>Goyave</b>													
<b>Ail</b>													
<b>Oseille</b>													

ACDI PROJECT DESIGN MISSION - FRUIT & VEGETABLE MARKETING PILOT PROJECT

ENQUÊTE DE MARCHÉ (FRUITS ET LÉGUMES FRAIS)  
QUESTIONNAIRE - COMPARATIFS/THÈSES

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	COUNT	AVG	MAX	MIN	
REMPLI PAR	A	A	A	A	A	A	A	T	T	T	T	T	T	B	B	B	B	B	B	B	B	20			
REPOURANT (F1,00)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	20	1	1	0
GROUPE D'ÂGE (1,2,3)	2	2	2	2	1	2	2	2	2	2	2	2	3	1	2	2	2	2	2	3	20	2	3	1	
PROFESSION DU CHEF DE F	2	3	2	2	1	2	3	1	2	0	1	2	0	2	1	1	1	1	1	2	20	2	3	0	
NOUVEAU DE PERS Adultes	3	4	2	2	2	2	2	1	3	2	2	3	2	0	4	3	2	4	6	5	20	3	0	1	
Enfants	5	9	3	1	3	7	1	4	0	3	12	7	1	12	0	5	4	5	12	3	20	6	12	1	
DEPENSE MENSUELLE/Semaine																									
- Salais sèche	8700	8350	5500	5150	4350	5950	4125	3400	8800	675	2850	4750	1675	9100	5800	4550	2965	3525	5700	5440	20	5020	9100	675	
- Salais pivoles	2350	6000	5550	1675	1000	1450	3600	3300	7025	425	1725	2175	1275	7850	3950	6000	2500	1675	2000	3650	20	3199	7050	425	
visites au marché/seul	6	6	7	5	7	7		4	5	7	7	7	2	3	7	7	7	7	7	7	19	6	7	2	
Paiement (col, cr2, m3)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	20	1	1	1	
OU ACHETÉ VOUS																									
Marché	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	20	1	1	1	
Vendeurs itinérants									1	1		1									3	1	1	1	
Tousjours de/des séas																									
Tousjours											1										1	1	1	1	
Souvent																	1				1	1	1	1	
Parfois	1	1	1	1	1	1	1	1	1	1	1			1	1	1		1	1	1	17	1	1	1	
Paiement (col, cr2, m3)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	19	1	1	1	
Qual(s) marché(s) fréquenté	1	1	2	2	2	1	1	1	1	1	2	5		1	1	1	4	4	7	7	19	2	7	1	
pourquoi	1,2	2	1	3,1	1,3	1,2	1	1	1	1	3	1	1	2	3	2	1	3	3	3	7	1	3	0	
QUE FAUDRAIT-IL AMÉLIORER																									
fraicheur		2		2	2	2		2	2	2	1	2			2		1	1		1	13	2	2	1	
goût	3	3	1	2	1	2	3	1	3	3	3	1		1	1	2	2	1	2	1	19	2	3	1	
régularité	1	1	3	1	3	3	1	2	1	3	2	2		2	2	1	2	2	1	3	19	2	3	1	
prix	2	2	2	3	2	2	2	1	1	2	1	1		1	1	1	2	2	1	1	19	2	3	1	
installations	2	2	2	2	3	3	2	1	1	1	1	2		3	1	2	1	1	1	1	19	2	3	1	
Autres	1	1	1	3	3	3	1	7	4,3		4	4,3		7	5	5	2	7		5	17	2	7	0	
FRUITS ET LÉGUMES (achats/semaine)																									
1. SALAIS SÈCHE (Oct-Mai)																									
	QUANTITÉ																								
Tomate	TAS	7	6	6	5	7	7	5	4	5	3	5	7		40	30	20	10	12	25	16	19	12	40	3
Oignon	COBO	1	1.5	1	0.5	1	1	0.5	4	5	3	7	3	2					7		1	15	3	7	0.5
Aubergine	TAS	1																				1	1	1	1
Okra	TAS	6		4	4	5	14	4	4	10	5	3	3	4	10		10	3				15	6	14	3
Carotte																									
Laitue	PIED	4	7	10	7	5	5		6	10			10		12	10	19		12	15	12	15	9	15	4
Épinards											4		1									2	3	4	1
Piments frais	TAS	1	3	1	1	2	3	1	4	5		3		1	5	0	2		7	5	4	17	3	0	1
Poivron			2																			1	2	2	2
Poitron																									
Courgette																					7	1	7	7	7
Pomme de terre		8	0	3	4	7	0							10	15		6					9	0	15	3
Banane	MIN	2	3	2	2		1	3		5												7	3	5	1
Orange	WHITE								20	30		20							7		60	5	27	60	7
Banane	WHITE	10	10	6			0	20	30		1	20	10		12	12				20	0	13	13	30	1
Citron	TAS/5	1		2				1	2		10	10	10	1								0	5	10	1
Bettes	COBO								1				1								4	0	10	1	1
Avocat													4									1	4	4	4

$\leq 25,000$  12/500 0  
 $25,000 - 50,000$  37,500 1  
 $50,000 - 100,000$  75,000 1  
 $> 100,000$  125,000 3

Elasticity of expenditure  
 on incomes is  
 0.803 (dry season)  
 0.753 (rainy season)

Log-log  
 Linear at means  
 0.803  
 0.753  
 0.22  
 0.28

20

ACDI PROJECT DESIGN MISSION - FRUIT & VEGETABLE MARKETING PILOT PROJECT

		PRODUITS DE MARCHÉ (FRUITS ET LÉGUMES FRAIS)																				COURT	AVG	MAX	MIN	
		QUESTIONNAIRE - CONSOMMATEURS/TRICES																								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20					
Goyave														30									1	30	30	30
All	COMO		1					1															2	1	1	1
Oseille	TMS								20		4	4	2										4	0	20	2
Autra familles	TMS										2		1										2	2	2	1
-----																										
PCFA																										
Tomate		700	600	600	500	700	700	500	600	500	150	500	700		3000	2000	1500	750	750	2000	1000	19	924	3000	150	
Oignon		350	450	350	150	300	300	375	100	125	75	175	150	50						350	200	15	220	450	50	
Aubergine			350																			1	350	350	350	
Autra		1000		400	400	500	1000	400	400	1000	250	300	300	200	1000		1250	350				0				
Carotte																						15	643	1000	200	
Laitue		800	1400	1500	1400	1800	1800		600	2000			1000		1500	1000	1000		1200	1250	1600	15	1217	2000	600	
Epinards												200		50								2	125	200	50	
Plante fraie		500	300	150	50	100	150	200	200	125		75		25	100	800	50		175	250	100	17	197	800	25	
Poivron			400																			1	400	400	400	
Poitron																						0				
Courgette																					750	1	750	750	750	
Pomme de terre		2000	2000	750	1000	1750	2000							1000	1500		900					9	1433	2000	750	
Banane		2100	1600	1600	1600		400	2000			1600								565		600	7	1614	2000	400	
Orange									700	1850			700									5	723	1850	565	
Mangue		250	1000	150			200	500	1500		500	1500	200		500	750				700	640	13	645	1500	150	
Citron		200			50						250		100	200	100	500						0	175	500	0	
Bettes										650				650					400	1050	750	1300	6	800	1300	400
Avocat															2000							1	2000	2000	2000	
Goyave													300									1	300	300	300	
All			250					250														2	250	250	250	
Oseille								500		200	200	200	100									5	240	500	100	
TOTAL		8700	8350	5500	5150	4250	5950	4125	3400	8000	675	2850	4750	1675	9100	5000	4550	2965	3525	5700	5440	20	5028	9100	675	
Tomate		100	100	100	100	100	100	100	100	50	100	100		75	66.66	75	75	62.5	00	62.5	19	87	100	50		
Oignon		350	300	350	300	300	300	350	25	25	25	25	50	25					50	200	15	178	350	25		
Aubergine			350																			1	350	350	350	
Haricot																						0				
Autra		300		100	100	100	100	100	100	100	50	100	100	50	100		125	116.6				15	109	300	50	
Carotte																						9				
Laitue		200	200	150	200	260	200		100	200			100		125	100	100		100	83.33	133.3	15	146	200	83.33	
Epinards												50		50								2	50	50	50	
Plante fraie		500	100	150	50	50	50	200	50	25		25	25	20	100	25			25	50	25	17	86	500	20	
Poivron			200																			1	200	200	200	
Poitron																						0				
Courgette																					107.1	1	107	107.1	107.1	
Pomme de terre		250	250	250	250	250	250							100	100		150					9	206	250	100	
Banane		1050	533.3	800	800		400	800			320											7	672	1050	320	
Orange									35	35			35					80.71			10	5	39	80.71	10	
Mangue		25	100	25			25	25	50		500	75	20		41.66	62.5				35	80	13	82	500	20	
Citron		200			25					125		10	20	10	500							7	127	500	10	
Bettes										650				650					100	131.2	75	1300	6	484	1300	75
Avocat															500							1	500	500	500	
Goyave													10									1	10	10	10	

ACDI PROJECT DESIGN MISSION - FRUIT & VEGETABLE MARKETING PILOT PROJECT

ENQUETE DE MARCHÉ (FRUITS ET LEGUMES FRAIS)  
QUESTIONNAIRE - COMMODITAIRES/TRICES

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	COUNT	AVG	MAX	MIN		
Ail		250						250														2	250	250	250		
Oseille									25		50	50	100									4	56	100	25		
2. SAISON DES PLANTES (Jan-Sep)																											
	QUANTITE												0														
Tomate	TAS	7	5	5	3	7	4	5	4	5	3	5	7	3	20	10	7	10				19	7	20	3		
Oignon	COMO	1	1	1	0.5	1.5	1	1	4	5	5	7	5								4	14	3	7	0.5		
Aubergine	TAS																					0					
Haricot																						0					
Okra	TAS	5		3	4	3	0	3	3	10	5	3	3	4	1							13	4	10	1		
Carotte																						0					
Laitue	PIED	4	6	10	5		3		12	10			10								8	10	8	12	3		
Epinards												4	3	2								2	3	4	2		
Piments frais	TAS	1	3	1	1	1	2	1	4	2	2	3	3		2	6	5				3	4	5	10	3	6	1
Poivron			2																			1	2	2	2		
Poitron																						0					
Courgette																						0					
Pomme de terre	CS	2	7	2	2	2															3	6	3	7	2		
Banane	MIN		3	3			1	2		5												5	3	5	1		
Orange									40	30			20									4	24	40	7		
Mangue	WHITE	0	7	5				7	10	30		1				15	12				18	10	11	30	1		
Citron	TAS	1			2					4		20	10	10	1							7	7	20	1		
Dattes										1				1							1	3	1	1	1		
Avocat															4							1	4	4	4		
Goyave									30													2	25	30	20		
Ail	COMO		1					0.5														2	1	1	0.5		
Oseille									4		4	4										3	4	4	4		
-----																											
PCFA																											
Tomate		350	250	250	150	350	200	200	250	75	250	350	75	2000	1000	1000	1000				1000	600	19	505	2000	75	
Oignon		450	300	350	300	450	500	350	100	125	125	175	250								1600	400	14	391	1600	100	
Aubergine																						0					
Haricot																						0					
Okra		600		75	100	75	200	150	150	500	125	150	150	100	500		1000	150				15	260	1000	75		
Carotte																						0					
Laitue		200	600	1000	500		300		600	1000			500		1000	500	500				600	1200	13	654	1200	200	
Epinards											100		50									2	75	100	50		
Piments frais		250	150	75	25	25	50	50	100	50	50		75		50	950	500				75	100	150	17	160	950	25
Poivron			500																			1	500	500	500		
Poitron																						0					
Courgette																						0					
Pomme de terre		500	1750	500	500	500															350	6	683	1750	350		
Banane			1600	2000			200	1600		1200												5	1400	2400	200		
Orange									1000	1050			700									4	938	1050	700		
Mangue		800	700	900			1050	750	2000		750				1500	1000					300	10	975	2000	300		
Citron		200			100				200		200	100	100	500								7	200	500	100		
Dattes									650				750									3	967	1500	650		
Avocat														3000							1500	1	3000	3000	3000		
Goyave								300				100										2	200	300	100		
Ail			150					150														2	150	150	150		



ACSI PROJECT DESIGN MISSION - FRUIT & VEGETABLE MARKETING PILOT PROJECT

		PRODUITS DE MARCHÉ (FRUITS ET LÉGUMES FRAIS)																				COURT	AVG	MAX	MIN
		GESTIONNAIRE - COMMODITAIRES/ÉCHÉES																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20				
Oseille	TOTAL	3350	6000	5550	1675	1000	1450	3600	1300	7025	425	1725	2175	1275	7050	3950	4000	2500	1675	2000	3050	5	80	100	50
Tomate		50	50	50	50	50	50	50	50	50	25	50	50	25	100	100	143	100		100	75	19	64	143	25
Oignon		450	300	250	600	300	500	350	25	25	25	25	50						400		400	14	271	600	25
Aubergine																						0			
Haricot																						0			
Okra		120		25	25	25	25	50	50	50	25	50	50	25	500							13	78	500	25
Carotte																						0			
Laitue		50	100	100	100		100		50	100			50					71			75	11	83	120	50
Épinards												25		25								2	25	25	25
Pisettes frais		250	50	75	25	25	25	50	25	25	25	0	25		25	150	100		25	25	30	10	54	250	0
Poisson			250																			1	250	250	250
Poisson																						0			
Courgette																						0			
Pomme de terre		250	250	250	250	250													117			6	228	250	117
Banane			533	800			200	100		240												5	515	800	200
Orange									25	35			35								143	4	59	143	25
Mangue		100	100	100			150	75	67			750				100	83			17		10	162	750	17
Citron		200			50					50		10	10	10	500							7	119	500	10
Buttes										650					750						1500	3	967	1500	650
Anacard															750							1	750	750	750
Goyave								10						5								2	0	10	5
All			150					300														2	225	300	150
Oseille									25		13	25										3	21	25	13

69

ACDI DESIGN MISSION - FRUIT & VEGETABLE MARKETING PILOT PROJECT, CHAD

MEMORIALES DES LEGUMES ET FRUITS AU MARCHÉ CENTRAL DE N'DJAMENA

	1986 1987											1988											1989																							
	DEC	JAN	FEB	MAR	AVR	MAI	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	AVR	MAI	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	AVR	MAR	AVR	MAY	AVG	STD	N	P	R.L.									
AIL CFA/XG			565	460	400	515	420	500	500	500	335		665	250	285	500	500	250	250	500	400	500	279	285																						
ARBECHINE CFA	345			250	505	325	560	575	365	270	500	315	135	135	335	335	335	750	455	000	005	335	134	335	500																					
ARBECHINE L CFA	75	130		100					365	200	335	215	225	105	225				335	1330	375	335	134	200	225																					
CAROTTE CFA	525	555	400	500	750	865	715	1200	1250	890	1200	575	400	400	625	715	715	835	000	715	665	545	001	450	625																					
CBOU CFA		330	285				1165			700	820	600	500	300	200			750	1665			535		465	260																					
CONCOMBRE CFA				295		285	170	285	500	285	325	375	200		100		360	545	365	415	250	375	64	375	100																					
CONNETTE CFA	260				250		750				500	250	300	385			715	555	700	285			400	575																						
EPINARD CFA	195	145			140	315	200	170	335	125	145				200	145	145	125	145	125	125	177	165	100																						
GONDO CFA	425	385		410	295	670	430	445	310	335	400	335	335	165	250	250	250	500	400	285	145	570	162	665	155																					
MARICOT V CFA		400	400	835		725	530	500	1000	500	500	500	335	665	500	295			250	1500		1000		1000	195																					
LAITUE CFA	300	250	160	245	505	825	595	625	625	430	430	335	275	300	250		295	500	555	305	535	335	182	205	135																					
OIGNON CFA	160	175	135	105	155	115	205	200	135	265	375	335	155	150	120	145	145	100	135	185	500	375	224	305	195																					
OIGNON P CFA	50		500	810	910	1250	2130	1000	2000	1000	1000	500	665	500	1000	500	500	500	500	2000	1000			500	500																					
OGRIILLE CFA						165	1820					335		665			335	145	500	85			94	335																						
PAYATE CFA	165		130		65	115	120	225	60		150				155	135	135	145	250	250	140	165	117	230																						
PILI-PILI CFA							1000										1000	1000		1500	1500			1000	1000																					
PIRETT D CFA	295		530		400	2705	2130	1500	750	835	1500	500	500	500	500	835	835	1000	1500	400	1000	1000	1000	665																						
POIVRON CFA	505	1000	910	655	1300	2425	3030	2500	2500	1250	3000	000	915	1750	1335			1500	1665	1250	2000	665		665	835																					
POMME DE T CFA	305	345	215	200	405	270	310	335	170	250	350	310	265	285	265	335	335	315	340	445	400	305	250	540	200																					
TOMATE F CFA	305	500	260	215	360	610	1145	715	1110	625	860	670	125	125	165			785	875	1000	500	615	521	265	140																					
BABANE CFA		255	860		440	335		345	500	335	500	300	335	350	320	335	335	285	400	400	335	400	243	335	000																					
CITRON CFA		350	715	1000	540	535	500	000	625	670	500	375	400	535	600	750	750	500	400	1000	500	500	244	200	500																					
BATTE CFA												400	500	430	575	575	430	1200	000	750	570	420	600	835																						
GOYAVE CFA							375			500							500	750	420	400	165		250																							
MARQUE CFA	295		220	205	135	320	225			430	335	000	250	150	210	210	375			320		300	364	575	185																					
MELON CFA	335			275	700	200		375	500		505	540	455	335	335	250	250			250		500		400	375																					
ORANGE CFA			170	250			175	170	285	250	270	125	200	145	300	400	400	300	300	200			335	202	165																					
PASTORNE CFA		150			125	85	100			145		100	145		65	65																														

517  
 Mean  
 R.L.  
 0.41

Appendix F.7 P.1

1070



SCDI DESIGN MISSION - FRUIT & VEGETABLE MARKETING PILOT PROJECT, CHAD

MARCHE DE N'DJAMENA : PRIX DE LA TOMATE

	CAISSE DE 50 KG					PAR KG				
	DEC 06	JAN 07	JAN 08	FEB 08	MAR 08	DEC 06	JAN 07	JAN 08	FEB 08	MAR 08
1				2000	3000				40	60
2		7000	5750	1600	3000		140	115	32	60
3			5000	2000	3000			100	40	60
4			4500	1500	3500			90	30	70
5			4500	2500	3500			90	50	70
6		7000	5000	2500	3500		140	100	50	70
7			4000	2000	3500			90	40	70
8		6000	2500	2000	3500		120	50	40	70
9			2500	2000	3500			50	40	70
10			2500	2500	3500			50	50	70
11		4500	2500	2500	1500		90	50	50	30
12		5000	2500	2500	1500		100	50	50	30
13		5000	2000	2000	2000		100	40	40	40
14			5000	2000	2500			100	40	70
15			4500	2500	3500			90	50	70
16			4500	2500	3500			90	50	70
17		4500	5000	2500	3500		90	100	50	70
18			4000	2500				80	50	
19		4500	4000	2000			90	80	40	
20			4000	2500				80	50	
21		3000	4500	3000			60	90	60	
22			4500	3000				90	60	
23	7000	2000	4000	3000		140	40	80	60	
24			2500	3000				50	60	
25			2000	2500				40	50	
26			2500	3000				50	60	
27	7000		2500	2000		140		50	40	
28			2000	1500				40	30	
29	7000		2000	1500		140		40	30	
30	6000		1500					30		
31			2000					40		
COMPT	4	10	30	29	17	3	10	30	29	17
AVG	6750	4850	3492	2297	3000	140	97	70	46	62
MIN	6000	2000	1500	1500	1500	140	40	30	30	30
MAX	7000	7000	5750	3000	3500	140	140	115	60	70
STD	433	1501	1229	459	691	0	30	25	9	14

Source : CHARS

102

## SOCIAL SOUNDNESS ANALYSIS

**A. Socio-Cultural Context****1. General Environmental, Economic, and Political Overview**

Agriculture accounts for one-half of Chad's GNP, occupies eighty five per cent of its work force, and furnishes eighty five per cent of its exports, according to the USAID Program Rationale Chad FY 1989-1994. Accordingly, it is and will continue to be the key to development in Chad.

The environmental, economic, and political conditions affecting Chad's agricultural sector are complex and do not lend themselves to easy interpretation. Recent events, such as war, drought, and deforestation have impacted on the environment and have led to major changes in the cultural foundations of many ethnic groups within Chad.

For the purposes of this proposal, we will focus on the Chari-Baguirmi prefecture, which is composed of several diverse ethnic and religious groups. Although all Chadians were adversely affected by the debilitating years of drought and war during the 1970's and 1980's, these events actually served to spur the agricultural development of the groups living in Chari-Baguirmi.

The great drought of 1972, for example, which completely upset national food security and plunged the country into a severe food crisis, caused the farmers along the Chari and Logone rivers to rethink their production strategies and, with financing from international donors, develop irrigated "perimeters". These irrigated perimeters decrease the reliance on rainfall and promote a more stable, sedentary lifestyle.

In the Kanem and Lac prefectures, due to the large numbers of cattle dying off from drought, large-scale population movements toward Lake Chad have occurred in order to bring herds to the fertile grazing areas along the Lake. Due to this change from a pastoralist to a more sedentary lifestyle, agricultural production around Lake Chad has increased tremendously.

The estimated population of the Chari-Baguirmi prefecture in 1987 was 827,000, of whom 551,700 people lived in N'Djamena. The total area of the prefecture is about 83,000 square kilometers, with a density of 7.4 people/km<sup>2</sup>. It is the second most populous prefecture in Chad, next to Mayo-Kebbi.

The major environmental problem faced, as expressed by the farmers and groupements visited by the ACDI design team, was the absence of a reliable pattern of rainfall, which greatly limits production and precludes flexibility in planting and harvesting. Groupements in the Karal area reported a weed problem and often have to weed three to four times before seeding. Other problems are insect and bird attacks, parasites, and fungal diseases. The groupements in Karal do not use fertilizers as the residue from the flooding of the lake supplies enough nutrients to the soil. Use of pesticides is not widespread due to lack of financial resources. Hence, crop losses to disease are frequent and often devastating.

The economic conditions facing the farmers of this area constitute a major constraint to fruit and vegetable production. While the government of Chad has adopted a free market policy, the real problem is lack of infrastructure, rendering any government policy virtually ineffectual. Other problems most commonly expressed to the design team were insufficient transport and its high cost, when available, lack of roads, and lack of storage and transformation facilities for surplus produce. In addition, the purchasing power of the Chadian consumer is very low. This places major restrictions on what the farmer can produce and what kind of price he can command in the marketplace.

On the political front, although the war has officially ended and massive reconstruction efforts have begun, peace is still a fragile commodity. Most Chadians, recognizing the instability of the government, have adopted a "wait and see" attitude before reinvesting in the country. This attitude has direct implications for the fruit and vegetable sector, where many farmers have either decreased production or reverted to subsistence farming until they can either transport their produce more economically or command a higher price for them in the marketplace. Most farmers within the project-targeted area stated that if the political situation of the government continues to stabilize, they would be willing to take more risks in terms of what and when they plant, and would utilize credit to finance machinery purchases.

## 2. Ethnic Overview

The predominant ethnic groups in the southern part of Chari-Baguirmi are the Sara, Massa, Baguirmien, Kotokos, Kanouris, Balalias, Barnes, Boa, and Arabs. The Karal area is comprised of Foulbe, Hausa, Arabs, Kanembou, and Ajirai. The language spoken most frequently in the Karal area is Hausa, although some people speak Arabic and French. The predominant language in the Dagarmassa area is Arabic. The literacy rate for the North, including Karal, is only 18.1 % for males and 5.5% for

females. In the south it is much higher, with males having a 45.7% literacy rate and females a 9.7% rate.

The population of the Chari-Baguirmi area is very heterogenous. Each ethnic group employs, moreover, different ways to earn a living. The Sara in the south are predominantly agriculturalists, while the Massa, although also primarily agriculturalists, possess livestock. The Baguirmien are agriculturalists who also engage in limited commerce and trading. In the northern part of the Chari-Baguirmi, with the arrival of the drought, the Hausa have changed from fishing to farming. They have a very strong work ethic and have been successful in working with the soil. They have continued to work the land even after the return of good rains, and now consider farming their primary activity with fishing being of lesser importance.

The state is the official owner of land in Chad. According to tradition, the chief (chef de canton) "owns" the land and organizes and controls its population. It is with the chief that contact is made and the gap bridged between the state and traditional society. Although the land is believed to be owned by "god", the chief has the right to distribute parcels of land to anyone who expresses an interest in it and demonstrates an ability to work it. There is no exchange of money, but the tiller of the land is expected to pay back a portion of his yield to the chief at harvest.

Given the lack of communication infrastructure in Chad, and the resulting isolation of most towns from the capital, the traditional chiefs still wield great power, authority, and influence, and it would be difficult, if not impossible, to undertake any agricultural project activity without their consent and approval.

### 3. Economic Activity Overview

In the Karal area, Hausa men and children perform the agricultural work. Hausa women are not allowed to leave the compound in which the house is located. Their function is to prepare meals and undertake any other activity which can be performed in the house. In the Dagarmassa area, women work in the fields, however men and boys compose the principal agricultural work force.

During the drought, many families in and around Karal moved ten to fifteen kms. closer to the river and their fields in order to decrease the amount of time spent commuting between home and field. Now that the rains have increased, many families have returned to original village sites.

Fishing and trading are the main dry-season activities, after the millet and niebe harvests. Women dry okra and tomatoes produced in excess of consumption needs. In Karal, the economy is basically subsistence in nature. Shops do not exist. The weekly outdoor market provides people with an opportunity to trade and make limited cash transactions for their goods. The proximity of Dagarmassa to N'Djamena makes the local marketplace there more dynamic than others visited.

## B. Beneficiaries

Virtually one hundred per cent of the villagers in the Karal area are farmers, although most also engage in secondary activities such as fishing and trading. The same income-earning activity is manifested for the people in Dagarmassa.

The initial beneficiaries of the project will be the participating groupement members and their families, estimated to be about 2000 people. The project also anticipates to impact positively on about 30 women market sellers. Indirect beneficiaries include fifteen extension agents, five of whom will receive direct training by the project, and ten who will benefit by participation in demonstrations and field days. Four counterparts (Marketing Logistics Officers, Marketing Intelligence Officer and Monitoring and Evaluation Officer) will benefit through training and on the job experience. Other indirect beneficiaries include transporters, small craftsmen, and entrepreneurs, both male and female.

In the Karal area, the typical unit of field labor is composed of the head of the household, his sons, and all other able-bodied related males living in the compound, i.e. uncles, brothers, cousins, and nephews. The fields are under cultivation throughout the year, which means back-breaking work for eight hours a day, 320 days a year. Mechanized and animal traction is very rarely utilized, with the overwhelming majority of farmers using hand hoes to till their land. A typical day runs from sunup to sundown, with a break from one to three in the afternoon to go home for lunch and prayer (see Annex E for groupement profiles).

If a farmer cannot find enough help within his own family, he may hire a laborer to work for him. The daily rate for laborers ranges from 350 CFA/US\$1.10 (CFA 318 = US\$1.00) for three hours to 1000 CFA (\$3.14) for the entire day. Payment for hired hands appears to be the only time a monetary value is assigned to labor. Neighboring farmers help each other whenever there is a shortage of manpower.

Hausa women stay in the house compound and are responsible for child care, cooking, cleaning, washing, and care of small animals. They also are responsible for drying and processing

vegetables, mainly okra and tomatoes, into more storable forms. The drying process is carried out on a small scale under very unhygienic conditions.

Women will benefit from project interventions aimed at reducing the time involved in agricultural labor and allow them to get involved in other activities and cottage industries. It is not clear whether money earned in cottage industries would be the property of the woman or the husband. Most likely, any such income would go towards the purchase of basic necessities for the family.

Transporters will benefit from the project through fixed and reliable shipments ready on scheduled pickup days, which will lead to increased revenues for them through better coordination of shipments with those from other groupements in other areas.

Sellers will be assured of more stable prices throughout a greater portion of the year, which will lead to increased revenue and higher consumer satisfaction. Women producers will not directly benefit from the project, but opportunities will be explored to work with groupements of women sellers in N'Djamena to improve their financial management skills. Extension agents and seconded government officials will gain valuable experience in computer use, statistics, project monitoring techniques, and technical skills.

Finally, small craftsmen and entrepreneurs will have the opportunity to produce and sell packing inputs, e.g. containers and crates.

### C. Participation

Throughout the project-design mission, the team sought advice and input from various government agencies (Ministries of Agriculture, Commerce and Plan), extension workers (ONDR, ONADEH, SECADEV), business people (retailers, wholesalers, transporters), producers, and consumers. Ministry officials and groupement members were especially receptive to the project idea and contributed significantly to it's design.

For example, the Director General of Agriculture, who had been on a study tour of U.S. cooperatives, told the team that a sustainable project of this sort is needed. It was his idea to broadcast a regularly-scheduled radio program giving price, production, and technical information to farmers. As the radio is the most widely utilized form of communication in Chad, such a program would be appropriate and sustainable.

The Director of ONDR stressed the importance of implementing a project dealing specifically with current marketing problems as a complement to other ongoing agricultural production projects.

He expressed concern that many projects try to do too much, and lose or have dissipated the aspect of replicability. He stated that the issue of consumer purchasing power should be investigated in order to determine consumers' ability to buy increased quantities of fruits and vegetables. Also, faced with the reality of limited consumer purchasing power, we should focus our efforts on the fruits and vegetables most commonly consumed by Chadians. He also felt it would be more advantageous to have members of the groupements act as project counterparts as they are the actual executers and direct beneficiaries of project activities. This, however, raises the question of project continuity when outside project financing ends.

Extension workers expressed frustration at not having the financial resources to do their work. They also pointed out a lack of coordination between the members of the marketing channels. The agents in the Karal area were very enthusiastic and saw an urgent need for this project, but stressed the importance of working within existing structures to achieve overall national goals.

From the market survey carried out by the design team, transporters and sellers identified several areas that the project should address and discussed how it might address and alleviate perceived problems (see Annex F).

Groupement members in the project-targeted areas are very articulate about their problems and their need for outside technical assistance. The design team was continually impressed by the full attendance and participation of the groupements at hastily-arranged village meetings. The thirty elderly members of the Karal federation regrouped at 9:00 p.m. one evening in order to meet with the team. The groupements in Karal expressed the desire and need to organize themselves first in order to more fully and advantageously participate in the marketing of their fruits and vegetables. It is apparent, from viewing the vast, lush fields of these farmers, that they take farming seriously and have an enormous desire to improve their standard of living.

Groupement members in the Dagarmassa area expressed similar problems and concerns as those in Karal. The members of these groupements are on average younger and more educated than the Karal groupements, and give the impression of having a higher degree of business "savvy". The project will endeavor to tailor the interventions derived in Karal to fit the needs and desires of the farmers in Dagarmassa.

The incentive for the groupements to participate in this project is the opportunity to overcome the overwhelming marketing problems they are facing, and the desire of the

103

membership to gain more control over the marketing aspects of their production. In finding solutions to these marketing problems, they will receive increased financial benefits through increased production and price stability (see Economic Analysis in Annex H).

As part of the pre-implementation stage of the project, extensive meetings will be held with GOC officials, extension agents, and groupement members to fully define the roles and responsibilities of each group. The purpose of these meetings will be to involve each group in the planning and decision-making processes as well as to give them a clearer understanding of project goals, purposes, inputs, and outputs.

Monitoring of progress in goal achievement will be the responsibility of the Monitoring Officer who will report periodically to the Marketing Specialist/Chief of Party. S/he, in turn, will communicate through regular meetings and quarterly reports to the appropriate ministries of the GOC.

#### D. Socio-Cultural Feasibility

As the project does not intend to deal directly with production, we do not envision major intra-family or intra-village problems that arise in the production sphere. In Karal, although not all villagers are members of groupements, there is a conscious effort to keep everyone informed of project activities and to solicit their participation in the project decision-making process.

An initial concern was the ability of the project to collaborate with a myriad of other donor agencies and still retain its own identity. There are many donor agencies with large sums of money at their disposal working in Chad. Questions arose as to how a relatively small project working with existing groups who, for the most part, are already working with other donor agencies can: 1) identify a specific role for itself without encroaching on the terrain of other agencies; 2) work within an already-established system; 3) define and establish additional roles and responsibilities for extension agents who will assist in project implementation; and 4) avoid duplication of effort.

When the design team initially approached SECADEV and the FED, they were met with skepticism. However, after emphasizing that the project intends to work within existing structures and will address only marketing problems of groupements, skepticism gave way to cautious endorsement. The regional office of SECADEV in Karal allowed access to its records, and SECADEV agents arranged visits and accompanied the team to the groupements. A solid base of trust has been established and

10/1

collaboration between the project and those agencies appears to be possible.

The success of SECADEV's efforts in Karal demonstrate that its approach to integrated sustainable development is valid, and that the village people trust and can work with the extension agents. All extension agents are either from the area itself, or have lived and worked for a minimum of five years with the target group. The extension agents all see marketing as one of the major problems experienced by the farmers and are eager to collaborate with other agencies to help find ways to solve those problems.

Karal is very isolated. It will be a difficult place in which to work, particularly given the absence of recreation opportunities and facilities. It will be very important that the expatriate advisor and ministry employees are capable of adapting to a very simple lifestyle, with little or no western consumer goods, in a fundamental Muslim ambience.

The traditional village council will be the forum for decision-making among the groupements. Although the official government structure is hierarchical, decision-making at the local level is consensus-oriented, participatory, and democratic. It will be essential that the village chief is kept informed of project activities.

Given the almost total lack of financial resources and the low formal educational levels of the farmers, the project will keep technological innovations appropriate to the capability of the target group. Credit, administered through VITA, will be available to the groupements, providing they can meet VITA's credit terms.

## E. Impact

### 1. Within The Project Area

Although not all villagers are required to be members of a production groupement, they are kept informed of activities through regular meetings. The groupements were not formed exclusively for production and also act as the village council, addressing the social and political problems of the villagers. The villagers said that they were constantly looking for new members to help cultivate the vast area available for production. Thus, if the project were able to implement more profitable marketing systems, chances are that other farmers would be attracted to join in production efforts with the groupements.

Another possible outgrowth from this project is the development of micro-enterprises and cottage industries for the

local manufacture of packing containers and trays. This could be a complementary activity for the Hausa women who currently make straw mats at home.

If any project-developed systems or activities produce a profit, the profit motive will ensure their sustainability. The project economic analysis indicates that, given favorable conditions over a seven-year period, the project is economically viable.

## 2. Outside The Project Area

The purpose of the project is to develop and apply marketing models employing interventions which will be replicable in other production areas. The project will test different segments within the marketing channel. This which will allow sufficient opportunity to identify feasible transport and seller scenarios to be applied in different areas.

Because the project will be testing hypotheses for the first time, even if a certain combination does not prove profitable to the farmers, the project will be able to analyze and provide feedback on that given problem and why the particular intervention didn't work. This will constitute the start of an institutional and programmatic memory.

## F. Issues

The two major issues identified during the project design mission were the lack of baseline data and the lack of a transportation infrastructure. Although the improvement of the transportation infrastructure is beyond the scope of this project, the means to explore some pressing transport problems currently being faced by fruit and vegetable farmers have been incorporated into the project design.

With regard to transportation problems, the project will address the identification of different types of transporters, the negotiation of transport contracts, and the testing of different combinations of producers and transporters. The overall goal of this intervention will be to put producer and transporter in contact with each other so as to increase the alternatives for the farmers in choosing a transporter. In addition, baseline transport studies will be undertaken at project inception in order to extrapolate future transport needs and trends.

Lack of marketing information limits marketing efforts by producers. If farmers were aware of potential demands in the N'Djamena marketplace, or elsewhere in the country, they would be better able to match production with market demand. At present, production and marketing are carried out in a

haphazard way with both groups incurring heavy losses during the peak of the season. The project intends to address this problem through the collection, analysis, and dissemination of marketing information via radio to the production areas targeted by the project. An effort will be made to work with the FED to broadcast the information over Radio Tchad.

To monitor project progress in the targeted areas, the project officers for Logistics, Marketing, and Monitoring will each have a role to play in seeing that the information is gathered, analyzed, and disseminated to the project participants—the groupements, government ministries, extension agents, transporters, and sellers. In addition, at the fifteenth and thirtieth months of project implementation, an evaluation will be carried out to determine whether the project has, or is making progress towards meeting its goals.

1/2

## ECONOMIC AND FINANCIAL ANALYSIS

### Introduction

Due to the lack of reliable statistics on crop production, transportation costs, and market prices, the ACDI design team was forced to rely on conversations with farmers, transporters, and merchants, along with fragmentary secondary sources of varied quality in making the estimates on which this analysis is based.

#### H.1. Methodology

This analysis is based on a cost stream comprised of the estimated capital, recurrent, and technical-assistance related costs of the project, and should provide an indication of the cost of replicability of marketing models.

Benefits generated by the project which can be classified as "soft" include: improved management, coordination, organization, and information flow. They have been quantified using low, medium and high scenarios, a high scenario meaning the greatest reduction in costs and the highest increase in wholesale prices over the current situation. These "soft" benefits have been quantified by estimating the economic impact they will have on the following tangible results of the project:

- a broadening of harvesting seasons, resulting in a higher average sales price on the wholesale market;
- reduction of post-harvest losses, resulting in an increased quantity of produce available for domestic use, i.e. household consumption and drying, and for sale on the commercial market;
- a reduction in transport and marketing-related losses, resulting in an increased quantity of produce reaching the market in better condition;
- a reduction in transport costs;
- an improvement in storage facilities and conservation techniques, resulting in prolonged shelf-life of the product, allowing for alternatives of deferred sales and/or assembling larger bulk consignments for shipment;
- improved quality of fresh produce with prolonged shelf-life and better appearance; graded so as to conform with requirements of the luxury and institutional markets, and import substitution standards.
- improved quality of produce processed through drying which would avoid market gluts at peak season. Quality dried produce, adequately packed with longer shelf-life and better appearance would conform to consumer preference and would permit diversification of market outlets to include the institutional market and retail stores.

These benefits have been applied to two models, one for Karal and one for Dagarnassa/N'Gauna, (derived from production information in Annex I., Section I.2.), using here also low, medium and high scenarios in which benefits are assumed to accrue progressively, starting at the end of Year 1

for Karal and of Year 2 in Dangarmassa, and continuing thereafter for a period of 7 years.

The models, presented in Appendix H.1 (Karal) and H.2 (Dagarmassa), have been extrapolated using the number of members in the target groupements as presented in Appendix H.3 (Karal) and H.4 (Dagarmassa) and combined in Appendix H.5 (participants of both areas).

The following charts give the total field output less field, harvest and marketing losses, as well as home consumption to give the percentage of total output arriving at market. Assumptions regarding project impact are extrapolated from the existing situation or "without project" and categorized as low, medium and high hypotheses and are as follows :

**KARAL MODEL**

**OUTPUT, HOME CONSUMPTION (including drying), LOSSES (field, harvest, transit or marketing)**

	Output	Field L	Harv L	Home C	Mktg L	Market
without project	100%	30%	25%	10%	30%	33%
low hypothesis	100%	25%	20%	9%	25%	41%
medium hypothesis	100%	20%	15%	8%	17%	52%
high hypothesis	100%	20%	10%	6%	8%	62%

The following transport and wholesale prices give the current or "without project" price in CFA (\$1.00 equals 320 CFA) per kilogram and then projects the change in price according to various assumptions.

**TRANSPORT CFA/Kg**

	Without project	With project		HIGH
		LOW	MEDIUM	
melon	40	30	20	10/100 52 5 33
watermelon	30	30	20	10
tomato	30	30	20	10 L 5.7 5 41
okra	35	30	20	10
peppers	40	30	20	10 M 4.3 5 52
onion	30	30	20	10 H 3.3 4 62

**WHOLESALE PRICE CFA/Kg**

melon	122	140	159	232
watermelon	50	58	65	95
tomato	66	76	86	125
okra	94	108	122	160
peppers	117	135	152	199
onion	88	101	114	132

114

**DAGARMASSA MODEL**

OUTPUT, HOME CONSUMPTION (including drying), LOSSES (field, harvest, transit or marketing)

	Output	Field L	Harv L	Home C	Mktg L	Market
without project	100%	35%	10%	13%	25%	38%
low hypothesis	100%	30%	5%	9%	20%	48%
medium hypothesis	100%	25%	5%	8%	15%	56%
high hypothesis	100%	25%	5%	6%	8%	62%

**TRANSPORT CFA/Kg**

	Without project	With project			<i>Loss Conv Mkt</i>		
		LOW	MEDIUM	HIGH			
melon	15	12	8	5			
concombre	15	12	8	10	54	5	35
tomato	18	15	8	10			
okra	18	15	8	10	76	6	48
peppers	20	15	8	10			
onion	10	10	8	10	39	6	56
					34	4	62

**WHOLESALE PRICE CFA/Kg**

melon	122	140	159	232
concombre	103	118	134	196
tomato	66	76	86	125
okra	94	108	122	160
peppers	117	135	152	199
onion	88	101	114	132

**FARMGATE PRICE CFA/Kg**

melon	107	128	151	227
concombre	88	106	126	186
tomato	48	61	78	115
okra	76	93	114	150
peppers	97	120	144	189
onion	78	91	106	122

**H.2. ANALYSIS OF RESULTS****FINANCIAL RESULTS (Farm Level)**

The impact of the project on the income as derived from current production figures (see Appendix I.2 and I.4) and expressed in CFA, of an average groupement member would indeed be significant, as shown in the table below :

## ANTICIPATED QUANTITATIVE IMPACT OF THE PROJECT (CFA/farm)

KARAL FARM	WITHOUT PROJECT	HYPOTHESIS		
		LOW	MEDIUM	HIGH
Sales	174,481	289,567	498,073	990,690
Home use *	27,695	38,185	52,182	68,734
Total Gross Rev.	202,176	327,752	550,255	1,059,424
Field losses	158,259	176,781	191,844	318,214
Harvest losses	92,318	106,069	115,106	127,286
Marketing losses	74,777	96,522	102,015	86,147
Total losses	325,354	379,372	408,965	531,647
DANGARMASSA				
Sales	270,672	428,455	616,807	987,940
Home use *	53,927	52,968	63,100	68,543
Total Gross Rev.	324,599	481,423	679,907	1,056,483
Field losses	248,184	265,505	276,756	400,839
Harvest losses	46,091	30,976	41,513	60,126
Marketing losses	90,224	107,114	108,848	85,908
Total losses	384,499	403,595	427,117	546,873

As can be seen from the above chart, currently the total losses exceed the total gross revenues by about 120,000CFA in Karal and 60,000CFA in Dagarmassa (approximately \$400 and \$185 respectively) per producer. The following table shows that with project interventions the percentage of total loss per farmer will decrease significantly and total revenues will even exceed total losses in the medium and high scenarios.

## INCREMENTAL GROSS REVENUE GENERATED BY THE PROJECT (CFA/farm)

Karal	0	125,576	348,079	857,248
		62%	172%	424%
Dangarmassa	0	156,824	355,308	731,884
		48%	109%	225%

\* used both for home consumption and drying

Under the low, medium and high hypotheses, each participating farmer's gross revenue would increase, as compared to his current gross revenue from fruit and vegetable production, by respectively 62%, 172% and 424% in the case of Karal, and by 48%, 109% and 225% in the case of Dagarmassa/N'Gauma. The large difference in incremental revenues between the two areas resides in the fact that Karal faces presently far greater marketing difficulties than Dagarmassa (where production problems are more severe). Because the project has been specifically designed to alleviate marketing constraints, its impact would thus be felt most in Karal, the priority area for project interventions.

## ECONOMIC RESULTS (Project level)

The "without project" column shows the production per metric ton currently reaching the market. The hypotheses show that with all models combined, a total of 298 members from Karal and Dagarmassa, there would be the following increase per metric ton of produce to the N'Djamena market :

## VOLUME OF PRODUCTION REACHING THE MARKET (MT)

	WITHOUT PROJECT	HYPOTHESIS		
		LOW	MEDIUM	HIGH
Melon	313	388	490	587
Cucumber	3	4	5	6
Watermelon	455	563	714	857
Tomato	248	312	374	429
Okra	116	144	182	217
Peppers	11	14	18	21
Onion	24	31	37	43
Total	1171	1456	1820	2158

From the above chart, total increase per vegetable in metric tons can be calculated as per the following chart:

## INCREMENTAL DELIVERIES ON ACCOUNT OF THE PROJECT (MT)

Melon	0	75	177	274
Cucumber	0	1	2	2
Water melon	0	108	259	402
Tomato	0	63	126	180
Okra	0	28	66	101
Peppers	0	3	6	9
Onion	0	6	13	19
Total	0	284	648	987
x		24%	55%	84%

The project would be instrumental in increasing deliveries of improved quality fruits and vegetables (by some 300 groupement members participating in this pilot project) to the N'Djamena market, from the current 1171 MT to respectively 1456 MT, 1820 MT and 2158 MT under the three scenarios, not on account of increased production, but solely as a result of improved crop handling, logistical and management practices.

## INTERNAL RATE OF RETURN

Appendix H.6 presents a calculation of the project's internal rate of return under different assumptions, as well as a brief sensitivity analysis.

In the first set of calculations, the total project costs (investment, recurrent and technical assistance) have been applied, while in the second set, technical assistance costs have been disregarded, to represent the likely costs to be incurred if similar marketing activities were to be replicated after the project ends.

The stream of net benefits has been calculated as the gross incremental benefits provided by the farm models, minus project costs. The returns generated by the low scenario have been assumed to accrue from the second year on, those of the medium scenario from the third year on, and those of the high scenario from the fourth year onward.

The rates of return the project would generate under such circumstances are as follows :

TOTAL PROJECT COSTS	/ LOW SCENARIO	: negative IRR
	/ MEDIUM SCENARIO	: negative IRR
	/ HIGH SCENARIO	: + 5%
INVESTMENT+RECURRENT COSTS	/ LOW SCENARIO	: negative IRR
	/ MEDIUM SCENARIO	: negative IRR
	/ HIGH SCENARIO	: + 26%

The rate of return is moderately sensitive to variations in projects costs and benefits. When total costs are increased by 10% or when benefits are lowered by 10%, the IRR drops from 5% to 0%. The same test applied in the case of investment and recurrent costs results in a drop from 26% to 20%.

The preceding analysis shows that provided nearly twice as much product per hectare reaches the market as at present, the selling price is increased by fifty percent and transportation costs are reduced by one half to two-thirds, the project, although a pilot project, would be economically viable. However, despite the current great inefficiency of the market, ACIDI believes that more realistically attainable project goals would be to reduce both the harvest loss and transport costs by twenty-five percent. It is difficult to predict changes in wholesale prices as they are dictated by market forces. Nevertheless, ACIDI feels that the interventions to be taught and put into practice through the project will result in great savings for the farmers and that, over time, those savings will manifest themselves in an increased volume of produce which will result in lower prices and increased affordability. Data on consumer purchasing power is scarce but information gathered during the market survey and other USAID marketing studies suggest that potential for increased absorption of fruits and vegetables exists.



**SITUATION WITH PROJECT - LOW HYPOTHESIS****Output, hose consumption and losses (kg)**

	%	Output Field L Harv L Hose C Hktg L Market					
		100%	25%	20%	9%	25%	41%
melon	kg	3500	875	525	189	478	1433
v. melon	kg	5250	1313	788	284	717	2150
tomato	kg	1200	300	180	65	164	491
okra	kg	1300	325	195	70	177	532
peppers	kg	90	23	14	5	12	37
onion	kg	150	38	23	8	20	61

**Average value (CFA/kg)**

	F.gate	Transp	W/s Hkt
melon	110	30	140
v. melon	27	30	58
tomato	46	30	76
okra	78	30	108
peppers	105	30	135
onion	71	30	101

**Average gross income and losses (Fruits & vegetables, CFA/earn)**

	Sales	H.Consum	Total
melon	158087	20847	178934
v. melon	59122	7796	66918
tomato	22555	2974	25530
okra	41577	5483	47059
peppers	3853	508	4361
onion	4373	577	4950
<b>Total/year</b>	<b>289567</b>	<b>38185</b>	<b>327752</b>

**Average losses (CFA/earn at Farmgate prices)**

	Field L Harvest	Hktg L	Total
melon	96513	57908	52696
v. melon	36094	21656	19707
tomato	13778	8262	7518
okra	25383	15230	13859
peppers	2352	1411	1284
onion	2670	1602	1450
<b>Total/year</b>	<b>176781</b>	<b>106069</b>	<b>96522</b>

**Output, hose consumption and losses (%)**

without project				
low hypothesis				
medium hypothesis	100%	20%	15%	8%
high hypothesis	100%	20%	10%	6%

**TRANSPORT WITH PROJECT**

TRANSPORT WITH PROJECT			W/S HKT WITH PROJECT		
LOW	MEDIUM	HIGH	LOW	MEDIUM	HIGH
30	20	10	140	159	232
30	20	10	58	65	95
30	20	10	76	86	125
30	20	10	100	122	160
30	20	10	135	152	199
30	20	10	101	114	132

## SITUATION WITH PROJECT - MEDIUM HYPOTHESIS

## Output, home consumption and losses (kg)

		Output	Field L	Harv L	Home C	Mktg L	Market
	%	100%	20%	15%	8%	17%	52%
melon	kg	3500	700	420	190	372	1817
w. melon	kg	5250	1050	630	286	558	2726
tomato	kg	1200	240	144	65	128	623
okra	kg	1300	260	156	71	138	675
peppers	kg	90	18	11	5	10	47
onion	kg	150	30	18	8	16	78

## Output, home consumption and losses (%) without project

low hypothesis	100%	25%	20%	9%	25%
medium hypothesis	100%	20%	15%	8%	17%
high hypothesis	100%	20%	10%	6%	8%

## Average value (CFA/kg)

	F.gate	Transp	W/s Mkt
melon	139	20	159
w. melon	45	20	65
tomato	66	20	86
okra	102	20	122
peppers	132	20	152
onion	94	20	114

## TRANSPORT WITH PROJECT

LOW	MEDIUM	HIGH	W/S	MKT WITH PROJECT	LOW	MEDIUM	HIGH
30	20	10	140	159	232		
30	20	10	58	65	95		
30	20	10	76	86	125		
30	20	10	108	122	160		
30	20	10	135	152	199		
30	20	10	101	114	132		

## Average gross income and losses (Fruits &amp; vegetables, CFA/earn)

	Sales	H.Consum	Total
melon	251887	26389	278277
w. melon	122672	12852	135524
tomato	41000	4295	45295
okra	68987	7228	76215
peppers	6173	647	6820
onion	7353	770	8123
Total/year	498073	52182	550254

## Average losses (CFA/earn at Farmgate prices)

	Field L	Harvest	Mktg L	Total
melon	97020	58212	51591	206823
w. melon	47250	28350	25126	100726
tomato	15792	9475	8398	33665
okra	26572	15943	14130	56645
peppers	2378	1427	1264	5069
onion	2832	1699	1506	6037
Total/year	191844	115106	102015	408965

## SITUATION WITH PROJECT - HIGH HYPOTHESIS

## Output, home consumption and losses (kg)

	%	Output Field L			Home C	Mktg L		Market
		100%	20%	10%		6%	8%	
melon	kg	3500	700	280	151	190	2179	
w. melon	kg	5250	1050	420	227	284	3269	
tomato	kg	1200	240	96	52	65	747	
okra	kg	1300	260	104	56	70	809	
peppers	kg	90	18	7	4	5	56	
onion	kg	150	30	12	6	8	93	

## Average value (CFA/kg)

	F.gate			W/s Mkt
	F.gate	Transp		
melon	221.8	10	232	
w. melon	85	10	95	
tomato	115.4	10	125	
okra	149.8	10	160	
peppers	188.9	10	199	
onion	122	10	132	

## Average gross income and losses (Fruits &amp; vegetables, CFA/farm)

Sales H.Consum Total

## Output, home consumption and losses (%)

without project			
low hypothesis	100%	25%	9%
medium hypothesis	100%	20%	8%
high hypothesis	100%	20%	6%

## TRANSPORT WITH PROJECT

TRANSPORT WITH PROJECT			W/S MKT WITH PROJECT		
LOW	MEDIUM	HIGH	LOW	MEDIUM	HIGH
30	20	10	140	159	232
30	20	10	58	65	95
30	20	10	76	86	125
30	20	10	108	122	160
30	20	10	135	152	199
30	20	10	101	114	132



**SITUATION WITH PROJECT - LOW HYPOTHESIS****Output, home consumption and losses (kg)**

		Output	Field L	Harv L	Home C	Mktg L	Market
	%	100%	30%	5%	9%	20%	40%
melon	kg	700	210	25	42	85	339
cocoambre	kg	250	75	9	15	30	121
tomato	kg	10500	3150	368	628	1271	5083
okra	kg	240	72	8	14	29	116
peppers	kg	264	79	9	16	32	128
onion	kg	825	248	29	49	100	399

**Average value (CFA/kg)**

	F.gate	Transp	W/s Mkt
melon	128	12	140
cocoambre	106	12	118
tomato	61	15	76
okra	93	15	108
peppers	120	15	135
onion	91	10	101

**Average gross income and losses (Fruits & vegetables, CFA/farm)**

	Sales	H.Consum	Total
melon	43479	5375	48854
cocoambre	12884	1593	14476
tomato	309571	38271	347842
okra	10817	1337	12154
peppers	15279	1849	17168
onion	36425	4503	40928
Total/year	428455	52968	481423

**Average losses (CFA/farm at Farmgate prices)**

	Field L	Harvest	Mktg L	Total
melon	26943	3143	10870	40956
cocoambre	7984	931	3221	12136
tomato	191835	22381	77393	291608
okra	6703	782	2704	10190
peppers	9468	1105	3820	14393
onion	22572	2633	9106	34312
Total/year	265505	30976	107114	403595

## SITUATION WITH PROJECT - MEDIUM HYPOTHESIS

## Output, home consumption and losses (kg)

		Output Field L	Harv L	Home C	Mktg L	Market	
	%	100%	25%	5%	8%	15%	56%
melon	kg	700	175	26	40	69	390
concombre	kg	250	62.5	9	14	25	139
tomato	kg	10500	2625	394	599	1032	5850
okra	kg	240	60	9	14	24	134
peppers	kg	264	66	10	15	26	147
onion	kg	825	206.25	31	47	81	460

## Average value (CFA/kg)

	F.gate	Transp	W/s Mkt
melon	151	8	159
cocombre	126	8	134
tomato	78	8	86
okra	114	8	122
peppers	144	8	152
onion	106	8	114

## Average gross income and losses (Fruits &amp; vegetables, CFA/farm)

	Sales	H.Consum	Total
melon	58737	6009	64746
concombre	17537	1794	19331
tomato	455156	46563	501720
okra	15271	1562	16833
peppers	21196	2168	23365
onion	48909	5003	53912
Total/year	616807	63100	679907

## Average losses (CFA/farm at Farmgate prices)

	Field L	Harvest	Mktg L	Total
melon	26355	3953	10365	40674
concombre	7869	1180	3095	12144
tomato	204225	30634	80322	315180
okra	6852	1028	2695	10575
peppers	9511	1427	3741	14678
onion	21945	3292	8631	33868
Total/year	276756	41513	108848	427118

125

**SITUATION WITH PROJECT - HIGH HYPOTHESIS****Output, home consumption and losses (kg)**

		Output	Field L	Harv L	Home C	Mktg L	Market
	%	100%	25%	5%	6%	8%	62%
melon	kg	700	175	26	30	38	431
concombre	kg	250	62.5	9	11	13	154
tomato	kg	10500	2625	394	449	563	6470
okra	kg	240	60	9	10	13	148
peppers	kg	264	66	10	11	14	163
onion	kg	825	206.25	31	35	44	508

**Average value (CFA/kg)**

	F.gate	Transp	W/s Mkt
melon	226.8	5	232
concombre	185.7	10	196
tomato	115.4	10	125
okra	149.8	10	160
peppers	188.9	10	199
onion	122	10	132

**Average gross income and losses (Fruits & vegetables, CFA/farm)**

	Sales	H.Consum	Total
melon	97823	6787	104610
concombre	28606	1985	30590
tomato	746613	51800	798413
okra	22153	1537	23689
peppers	30728	2132	32860
onion	62018	4303	66320
Total/year	987940	68543	1056484

**Average losses (CFA/farm at Farmgate prices)**

	Field L	Harvest	Mktg L	Total
melon	39690	5954	8506	54150
concombre	11606	1741	2487	15835
tomato	302925	45439	64923	413287
okra	8988	1348	1926	12263
peppers	12467	1870	2672	17010
onion	25163	3774	5393	34330
Total/year	400839	60126	85908	546873

FRUIT & VEGETABLE MARKETING PILOT PROJECT - CHAD

KARAL MODEL - 262 PARTICIPANTS (Karat and Gaitte)

Cropping pattern and yield	Ha	MT/ha
melon	91.70	10
v. melon	91.70	15
tomato	39.30	8
okra	34.06	10
peppers	2.62	9
onion	2.62	15

SITUATION WITHOUT PROJECT

Output, home consumption and losses (MT)

	%	Output Field L						Harv L	Home C	Mktg L	Market	33%
		100%	30%	25%	10%	30%	33%					
melon		917	275	160	40	130	303					
v. melon		1376	413	241	72	195	455					
tomato		314	94	55	17	45	104					
okra		341	102	60	18	40	113					
peppers		24	7	4	1	3	8					
onion		39	12	7	2	6	13					

Output, home consumption and losses (%)

without project	100%	25%	20%	9%	25%
low hypothesis	100%	25%	20%	9%	25%
medium hypothesis	100%	20%	15%	8%	17%
high hypothesis	100%	20%	10%	6%	8%

Average value (CFA/kg)

	F.gate	Transp	W/s Mkt
melon	82	40	122
v. melon	20	30	50
tomato	36	30	66
okra	59	35	94
peppers	77	40	117
onion	50	30	80

TRANSPORT WITH PROJECT

TRANSPORT WITH PROJECT			W/S Mkt WITH PROJECT		
LOW	MEDIUM	HIGH	LOW	MEDIUM	HIGH
30	20	10	140	159	232
30	20	10	50	65	95
30	20	10	76	86	125
30	20	10	100	122	160
30	20	10	135	152	199
30	20	10	101	114	132

Average gross income and losses (Fruits & vegetables, CFA000)

	Sales	H.Consun	Total
melon	24070	3948	28018
v. melon	9099	1444	10543
tomato	3744	594	4338
okra	6647	1055	7702
peppers	601	95	696
onion	754	120	874
Total/year	45714	7256	52970

Average losses (CFA00 at Fargate prices)

	Field L	Harvest	Mktg L	Total
melon	22550	13159	10659	46376
v. melon	8253	4014	3900	16967
tomato	3396	1901	1604	6901
okra	6029	3517	2049	12394
peppers	545	318	257	1120
onion	604	399	323	1406
Total/year	41464	24107	19592	85243

12/1

FRUIT & VEGETABLE MARKETING PILOT PROJECT - CHAD

SITUATION WITH PROJECT - LOW HYPOTHESIS

Output, home consumption and losses (MT)

	X	Output Field L	Harv L	Home C	Mktg L	Market
		100%	25%	20%	9%	25%
melon		917	229	138	50	125
v. melon		1376	344	206	74	100
tomato		314	79	47	17	43
okra		341	85	51	18	46
peppers		24	6	4	1	3
onion		39	10	6	2	5

Average values (CFA/kg)

	F.gate	Transp	U/s Mkt
melon	110	30	100
v. melon	27	30	50
tomato	46	30	76
okra	78	30	100
peppers	105	30	135
onion	71	30	101

Average gross income and losses (Fruits & vegetables, CFA000)

	Sales	H.Consum	Total
melon	41419	5462	46881
v. melon	15490	2043	17532
tomato	5909	779	6689
okra	10093	1436	12329
peppers	1010	133	1143
onion	1146	151	1297
Total/year	75067	10004	85071

Average losses (CFA000 at Farmgate prices)

	Field L Harvest	Mktg L	Total
melon	25206	15172	40378
v. melon	9457	5674	15131
tomato	3600	2165	5765
okra	6650	3990	10640
peppers	616	370	986
onion	700	420	1120
Total/year	46317	27790	74107

Output, home consumption and losses (\$)

	low hypothesis	medium hypothesis	high hypothesis
without project			
low hypothesis			
medium hypothesis	100%	20%	15%
high hypothesis	100%	20%	10%

TRANSPORT WITH PROJECT

U/S NET WITH PROJECT

LOW	MEDIUM	HIGH	LOW	MEDIUM	HIGH
30	20	10	100	159	232
30	20	10	50	65	95
30	20	10	76	86	125
30	20	10	100	122	160
30	20	10	135	152	199
30	20	10	101	114	132

FRUIT & VEGETABLE MARKETING PILOT PROJECT - CHAD

SITUATION WITH PROJECT - MEDIUM HYPOTHESIS

Output, home consumption and losses (MT)

	Output	Field L	Harv L	Home C	Mktg L	Market
	I	100%	20%	15%	8%	17%
melon		917	183	110	50	90
v. melon		1376	275	165	75	146
tomato		314	63	30	17	33
okra		341	68	41	19	36
peppers		24	5	3	1	3
onion		39	8	5	2	4

Average value (CFA/kg)

	F.gate	Transp	W/s Mkt
melon	139	20	159
v. melon	45	20	65
tomato	66	20	86
okra	102	20	122
peppers	132	20	152
onion	94	20	114

Average gross income and losses (Fruits & vegetables, CFA000)

	Sales	H.Consum	Total
melon	65994	6914	72908
v. melon	32140	3367	35507
tomato	10742	1125	11867
okra	10075	1094	10968
peppers	1617	169	1787
onion	1926	202	2128
Total/year	130495	13672	144167

Average losses (CFA000 at Fregate prices)

	Field L	Harvest	Mktg L	Total
melon	25419	15252	13517	54188
v. melon	12300	7420	6583	26303
tomato	4130	2403	2200	8733
okra	6962	4177	3702	14841
peppers	623	374	331	1328
onion	742	445	395	1582
Total/year	50263	30150	26728	107141

Output, home consumption and losses (X)

	without project	low hypothesis	medium hypothesis	high hypothesis
	100%	25%	20%	9%
	25%	100%	20%	8%
	15%	15%	100%	17%
	8%	6%	10%	100%

TRANSPORT WITH PROJECT

	LOW	MEDIUM	HIGH	W/S Mkt WITH PROJECT	LOW	MEDIUM	HIGH
	30	20	10	140	159	232	
	30	20	10	50	65	95	
	30	20	10	76	86	125	
	30	20	10	100	122	160	
	30	20	10	135	152	199	
	30	20	10	101	114	132	

FRUIT & VEGETABLE MARKETING PILOT PROJECT - CHAD

SITUATION WITH PROJECT - HIGH HYPOTHESIS

Output, home consumption and losses (MT)

	Output	Field L	Harv L	Home C	Mktg L	Market
	100%	20%	10%	6%	8%	62%
melon	917	183	73	40	50	571
v. melon	1376	275	110	50	74	856
tomato	314	63	25	14	17	196
okra	341	68	27	15	18	212
peppers	24	5	2	1	1	15
onion	39	8	3	2	2	24

Average values (CFA/kg)

	F.gate	Transp	H/s Mkt
melon	222	10	232
v. melon	85	10	95
tomato	115	10	125
okra	150	10	160
peppers	189	10	199
onion	122	10	132

Average gross income and losses (Fruits & vegetables, CFA000)

	Sales	H.Consum	Total
melon	126642	8706	135429
v. melon	72799	5051	77850
tomato	22591	1567	24158
okra	31769	2204	33973
peppers	2773	192	2966
onion	2905	207	3193
Total/year	259561	18000	277569

Average losses (CFA000 at Farmgate prices)

	Field L	Harvest	Mktg L	Total
melon	40670	16271	11012	67962
v. melon	23304	9353	6330	39067
tomato	7256	2903	1964	12123
okra	16204	4002	2763	17049
peppers	891	356	241	1488
onion	959	304	260	1662
Total/year	83372	33349	22571	139291

Output, home consumption and losses (\$)

	without project	low hypothesis	medium hypothesis	high hypothesis	
	100%	25%	20%	9%	25%
low hypothesis	100%	20%	15%	8%	17%
medium hypothesis	100%	20%	10%	6%	8%

TRANSPORT WITH PROJECT

LOW	MEDIUM	HIGH	W/S	MEY	WITH PROJECT
30	20	10	140	159	232
30	20	10	50	65	95
30	20	10	76	86	125
30	20	10	100	122	160
30	20	10	135	152	199
30	20	10	101	114	132

19

FRUIT & VEGETABLE MARKETING PILOT PROJECT - CHAD

DANGARASSA MODEL - 36 PARTICIPANTS (Dangarassa and N'Gaoua)

Cropping pattern and yield	Ha	MT/ha
melon	3.60	7.0
concombre	1.03	5.0
tomato	27.00	14.0
okra	0.72	12.0
peppers	1.00	0.0
onion	1.00	16.5

SITUATION WITHOUT PROJECT

Output, home consumption and losses (MT)

I	Output Field L		Harv L	Home C	Mktg L	Market
	100%	35%	10%	13%	25%	30%
melon	25.2	0.0	1.6	1.9	3.2	9.6
concombre	9.0	3.2	0.6	0.7	1.1	3.4
tomato	378.0	132.3	24.6	20.7	40.1	144.3
okra	8.6	3.0	0.6	0.7	1.1	3.3
peppers	9.5	3.3	0.6	0.7	1.2	3.6
onion	29.7	10.4	1.9	2.3	3.0	11.3

Average value (CFA/kg)

	F. gate	Transp	W/s Mkt
melon	107	15	122
concombre	80	15	103
tomato	40	18	66
okra	76	18	94
peppers	97	20	117
onion	78	10	88

Average gross income and losses (Fruits & vegetables, CFA000)

	Sales	H. Consum	Total
melon	1029	205	1234
concombre	302	60	363
tomato	6926	1300	8306
okra	251	50	301
peppers	352	70	422
onion	804	176	1050
Total/year	9744	1941	11686

Average losses (CFA000 at Farmgate prices)

	Field L	Harvest	Mktg L	Total
melon	944	175	343	1462
concombre	277	51	101	429
tomato	6350	1179	2309	9838
okra	230	43	84	356
peppers	323	60	117	500
onion	811	151	295	1256
Total/year	8935	1659	3240	13842

121

FRUIT & VEGETABLE MARKETING PILOT PROJECT - CHAD

SITUATION WITH PROJECT - LOW HYPOTHESIS

Output, home consumption and losses (MT)

	%	Output Field L		Harv L	Home C	Wtgy L	Market
		100%	30%	5%	9%	20%	40%
melon		25.2	7.6	0.9	1.5	3.0	12.2
concombre		9.0	2.7	0.3	0.5	1.1	4.4
tomato		370.0	113.4	13.2	22.6	45.7	183.0
okra		0.6	2.6	0.3	0.5	1.0	4.2
peppers		9.5	2.9	0.3	0.6	1.2	4.6
onion		29.7	0.9	1.0	1.8	3.6	14.4

Average value (CFA/kg)

	F. gnte	Transp	W/s Mkt
melon	120	12	100
concombre	106	12	110
tomato	61	15	76
okra	93	15	100
peppers	120	15	135
onion	91	10	101

Average gross income and losses (Fruits & vegetables, CFA000)

	Sales H. Consum	Total	
melon	1565	194	1759
concombre	464	57	521
tomato	11145	1370	12522
okra	309	60	430
peppers	550	60	610
onion	1311	162	1473
Total/year	15424	1907	17331

Average losses (CFA000 at Farmgate prices)

	Field L	Harvest	Wtgy L	Total
melon	970	113	391	1474
concombre	287	34	116	437
tomato	6906	806	2786	10498
okra	241	20	97	367
peppers	341	60	130	518
onion	813	95	320	1235
Total/year	9558	1115	3856	14529

197

FRUIT & VEGETABLE MARKETING PILOT PROJECT - CHAD

SITUATION WITH PROJECT - MEDIUM HYPOTHESIS

Output, home consumption and losses (MT)

	Output Field L Harv L Home C Mktg L Market					
	100%	25%	5%	8%	15%	56%
melon	25.2	6.3	0.9	1.4	2.5	14.0
concombre	9.0	2.3	0.3	0.5	0.9	5.0
tomato	378.0	94.5	14.2	21.5	37.2	210.6
okra	8.6	2.2	0.3	0.5	0.8	4.8
peppers	9.5	2.4	0.4	0.5	0.9	5.3
onion	29.7	7.4	1.1	1.7	2.9	16.5

Average value (CFA/kg)

	F.gate	Transp	W/s Mkt
melon	151	8	159
concombre	126	8	134
tomato	78	8	86
okra	114	8	122
peppers	144	8	152
onion	186	8	194

Average gross income and losses (Fruits & vegetables, CFA000)

	Sales	H.Consum	Total
melon	2115	216	2331
concombre	631	65	696
tomato	16306	1676	18062
okra	558	54	606
peppers	763	78	841
onion	1761	180	1941
Total/year	22205	2272	24477

Average losses (CFA000 at Farmgate prices)

	Field L	Harvest	Mktg L	Total
melon	949	142	373	1464
concombre	283	42	111	437
tomato	7352	1163	2892	11346
okra	247	37	97	381
peppers	342	51	135	528
onion	798	119	311	1219
Total/year	9963	1494	3919	15376

10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50

123

FRUIT & VEGETABLE MARKETING PILOT PROJECT - CHAD

SITUATION WITH PROJECT - HIGH HYPOTHESIS

Output, home consumption and losses (MT)

	Output Field L						Harv L		Home C		Mktg L		Market	
	1	100%	25%	5%	6%	8%	6%	6%	6%	6%	6%	6%	6%	
melon		25.2	6.3	0.9	1.1	1.4	1.1	1.4	1.1	1.4	1.4	15.5		
cucumber		9.0	2.3	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.5	5.5		
tomato		370.0	94.5	14.2	16.2	20.3	20.3	232.9						
okra		0.6	2.2	0.3	0.4	0.5	0.5	5.3						
peppers		9.5	2.4	0.4	0.4	0.5	0.5	5.9						
onion		29.7	7.4	1.1	1.3	1.6	1.6	18.3						

Average value (CFA/kg)

	F.gate	Transp	W/s Mkt
melon	227	5	232
cucumber	106	10	196
tomato	115	10	125
okra	150	10	160
peppers	109	10	199
onion	122	10	132

Average gross income and losses (Fruits & vegetables, CFA000)

	Sales	H.Consum	Total
melon	3522	244	3766
cucumber	1030	71	1101
tomato	26078	1065	28743
okra	797	55	853
peppers	1106	77	1183
onion	2233	155	2388
Total/year	35566	2460	38026

Average losses (CFA000 at Farmgate prices)

	Field L	Harvest	Mktg L	Total
melon	1429	214	306	1949
cucumber	419	63	90	570
tomato	10905	1636	2337	14878
okra	324	49	69	441
peppers	449	67	96	612
onion	906	136	194	1236
Total/year	14430	2165	3093	19687

FRUIT & VEGETABLE MARKETING PILOT PROJECT - CHAD

KARAL MODEL - 262 PARTICIPANTS (Karal and Gaitte)

Cropping pattern and yield	Ha	MT/Ha
melon	91.70	10
v. melon	91.70	15
tomato	39.30	8
okra	34.06	10
peppers	2.62	9
onion	2.62	15

SITUATION WITHOUT PROJECT

Output, home consumption and losses (MT)						
	Output	Field L	Harv L	Home C	Wtq L	Market
melon	1003	308	251	103	303	333
v. melon	1376	413	241	72	195	455
tomato	314	94	55	17	45	104
okra	341	102	60	18	40	113
peppers	24	7	4	1	3	8
onion	39	12	7	2	6	13

Average gross income and losses (Fruits & vegetables, CFA000)

	Sales	H.Consum	Total
melon	24870	3948	28818
v. melon	9099	1444	10543
tomato	3744	594	4338
okra	6447	1055	7502
peppers	601	95	696
onion	754	120	874
Total/year	45714	7256	52970

Average losses (CFA00 at Farmgate prices)

	Field L	Harvest L	Wtq L	Total
melon	22558	13159	10659	46376
v. melon	8253	4814	3900	16967
tomato	3396	1901	1604	6901
okra	6029	3517	2849	12394
peppers	545	318	257	1120
onion	684	399	323	1406
Total/year	41464	24187	19592	85243

DANGARMASSA MODEL - 36 PARTICIPANTS (Dangarmassa and N'Gauco)

Cropping pattern and yield	Ha	MT/Ha
melon	3.60	7.0
concombre	1.00	5.0
tomato	27.00	14.0
okra	0.72	12.0
peppers	1.08	8.0
onion	1.00	16.5

SITUATION WITHOUT PROJECT

Output, home consumption and losses (MT)						
	Output	Field L	Harv L	Home C	Wtq L	Market
melon	1003	351	108	131	251	303
concombre	9.0	3.2	0.6	0.7	1.1	3.4
tomato	378.0	132.3	24.6	28.7	48.1	144.3
okra	8.6	3.0	0.6	0.7	1.1	3.3
peppers	9.5	3.3	0.6	0.7	1.2	3.6
onion	29.7	10.4	1.9	2.3	3.0	11.3

Average gross income and losses (Fruits & vegetables, CFA000)

	Sales	H.Consum	Total
melon	1029	285	1234
concombre	302	60	363
tomato	6926	1300	8306
okra	251	50	301
peppers	352	70	422
onion	804	176	1060
Total/year	9744	1941	11686

Average losses (CFA000 at Farmgate prices)

	Field L	Harvest L	Wtq L	Total
melon	944	175	343	1462
concombre	277	51	101	429
tomato	6350	1179	2309	9838
okra	230	43	84	356
peppers	323	60	117	500
onion	811	151	295	1256
Total/year	8935	1659	3248	13842

ALL MODELS - 290 PARTICIPANTS (Karal and Dangarmassa)

Cropping pattern and yield	Ha
melon	95.30
concombre	1.00
v.melon	91.70
tomato	66.30
okra	34.70
peppers	3.70
onion	4.42
Total	290.00

SITUATION WITHOUT PROJECT

Output, home consumption and losses (MT)						
	Output	Field L	Harv L	Home C	Wtq L	Market
melon	942.2	283.9	162.1	50.1	133.2	312.9
concombre	9.0	3.2	0.6	0.7	1.1	3.4
v.melon	1375.5	412.7	240.7	72.2	195.0	454.9
tomato	692.4	226.6	79.6	45.3	92.7	248.3
okra	349.2	105.2	60.2	18.5	49.4	116.0
peppers	33.1	10.4	4.7	2.0	4.6	11.4
onion	69.0	22.2	8.0	4.3	9.3	24.3

Average gross income and losses (Fruits & vegetables, CFA000)

	Sales	H.Consum	Total
melon	25900	4153	30052
concombre	302	60	363
v.melon	9099	1444	10543
tomato	10649	1974	12643
okra	6097	1105	8002
peppers	952	165	1118
onion	1638	296	1934
Total/year	55458	9198	64656

Average losses (CFA000 at Farmgate prices)

	Field L	Harvest L	Wtq L	Total
melon	23502	13334	11002	47838
concombre	277	51	101	429
v.melon	8253	4814	3900	16967
tomato	9746	3160	3913	16819
okra	6258	3559	2932	12750
peppers	867	378	375	1620
onion	1495	549	618	2662
Total/year	50398	25847	22840	99085

137

FRUIT & VEGETABLE MARKETING PILOT PROJECT - CHAD

SITUATION WITH PROJECT - LOW HYPOTHESIS

Output, home consumption and losses (MT)

	Output Field L		Harv L	Home C	Mktg L	Market
	100%	25%	20%	9%	25%	41%
melon	917	229	130	50	125	376
v. melon	1376	344	206	74	100	563
tomato	314	79	47	17	43	129
okra	341	85	51	18	46	139
peppers	24	6	4	1	3	10
onion	39	10	6	2	5	16

Average gross income and losses (Fruits & vegetables, CFA000)

	Sales H.Consum		Total
	Field L	Harvest L	Mktg L
melon	41419	5462	46881
v. melon	15490	2043	17532
tomato	5909	779	6689
okra	10093	1436	12329
peppers	1010	133	1143
onion	1146	151	1297
Total/year	75067	10004	85071

Average losses (CFA000 at Farmgate prices)

	Field L Harvest L Mktg L			Total
	melon	25206	15172	13006
v. melon	9457	5674	5163	20294
tomato	3600	2165	1970	7742
okra	6650	3990	3631	14271
peppers	616	370	337	1323
onion	700	420	302	1501
Total/year	46317	27790	25209	99316

SITUATION WITH PROJECT - LOW HYPOTHESIS

Output, home consumption and losses (MT)

	Output Field L		Harv L	Home C	Mktg L	Market
	100%	30%	5%	9%	20%	41%
melon	25.2	7.6	0.9	1.5	3.0	12.2
concombre	9.0	2.7	0.3	0.5	1.1	4.4
tomato	378.0	113.4	13.2	22.6	45.7	183.0
okra	8.6	2.6	0.3	0.5	1.0	4.2
peppers	9.5	2.9	0.3	0.6	1.2	4.6
onion	29.7	8.9	1.0	1.8	3.6	14.4

Average gross income and losses (Fruits & vegetables, CFA000)

	Sales H.Consum		Total
	Field L	Harvest L	Mktg L
melon	1565	194	1759
concombre	464	57	521
tomato	11145	1370	12522
okra	309	40	430
peppers	550	60	610
onion	1311	162	1473
Total/year	15424	1907	17331

Average losses (CFA000 at Farmgate prices)

	Field L Harvest L Mktg L			Total
	melon	970	113	391
concombre	287	34	116	437
tomato	6906	806	2706	10490
okra	241	28	97	367
peppers	341	40	130	518
onion	813	95	320	1235
Total/year	9550	1115	3056	14529

SITUATION WITH PROJECT - LOW HYPOTHESIS

Output, home consumption and losses (MT)

	Output Field L		Harv L	Home C	Mktg L	Market
	100%	25%	20%	9%	20%	40%
melon	942.2	236.8	130.4	51.0	120.2	307.7
concombre	9.0	2.7	0.3	0.5	1.1	4.4
v. melon	1375.5	343.9	206.3	74.3	107.0	563.3
tomato	692.4	192.0	60.4	39.6	80.7	311.7
okra	349.2	87.7	51.4	18.9	47.5	143.7
peppers	33.1	8.7	3.9	1.0	4.4	14.3
onion	69.0	10.7	6.9	3.9	9.0	30.5

Average gross income and losses (Fruits & vegetables, CFA000)

	Sales H.Consum		Total
	Field L	Harvest L	Mktg L
melon	42904	5655	48559
concombre	464	57	521
v. melon	15490	2043	17532
tomato	17054	2157	19211
okra	11282	1405	12767
peppers	1560	201	1761
onion	2457	313	2770
Total/year	91291	11911	103202

Average losses (CFA000 at Farmgate prices)

	Field L Harvest L Mktg L			Total
	melon	26256	15205	14190
concombre	287	34	116	437
v. melon	9457	5674	5163	20294
tomato	10514	2970	4756	18240
okra	6892	4018	3728	14638
peppers	957	410	474	1841
onion	1512	515	710	2736
Total/year	55675	20905	29145	113925

126

FRUIT & VEGETABLE MARKETING PILOT PROJECT - CHAD

SITUATION WITH PROJECT - MEDIUM HYPOTHESIS

Output, home consumption and losses (MT)

	Output Field L		Harv L	Home C	Mktg L	Market
	100%	20%	15%	8%	17%	52%
melon	917	183	110	50	90	476
v. melon	1376	275	165	75	146	714
tomato	314	63	30	17	33	163
okra	341	68	41	19	36	177
peppers	24	5	3	1	3	12
onion	39	8	5	2	4	20

Average gross income and losses (Fruits & vegetables, CFA000)

	Sales H.Consum		Total
	65994	6914	72908
melon	32140	3367	35507
v. melon	10742	1125	11867
tomato	10075	1094	19968
okra	1617	169	1787
peppers	1926	292	2120
onion	130495	13672	144167

Average losses (CFA000 at Farmgate prices)

	Field L	Harvest L	Mktg L	Total
	melon	25419	15252	13517
v. melon	12300	7420	6583	26390
tomato	4130	2403	2200	8020
okra	6962	4177	3702	14841
peppers	623	374	331	1328
onion	742	445	395	1582
Total/year	50263	30150	26720	107149

SITUATION WITH PROJECT - MEDIUM HYPOTHESIS

Output, home consumption and losses (MT)

	Output Field L		Harv L	Home C	Mktg L	Market
	100%	25%	5%	8%	15%	56%
melon	25.2	6.3	0.9	1.4	2.5	14.0
concombre	9.0	2.3	0.3	0.5	0.9	5.0
v. melon	370.0	94.5	14.2	21.5	37.2	210.6
tomato	0.6	2.2	0.3	0.5	0.8	4.8
okra	9.5	2.4	0.4	0.5	0.9	5.3
peppers	29.7	7.4	1.1	1.7	2.9	16.5
onion						

Average gross income and losses (Fruits & vegetables, CFA000)

	Sales H.Consum		Total
	2115	216	2331
melon	631	65	696
concombre	16306	1676	18062
tomato	550	56	606
okra	763	70	841
peppers	1761	180	1941
onion	22205	2272	24477

Average losses (CFA000 at Farmgate prices)

	Field L	Harvest L	Mktg L	Total
	melon	949	142	373
concombre	283	42	111	437
tomato	7352	1103	2092	11346
okra	247	37	97	381
peppers	342	51	135	528
onion	790	119	311	1219
Total/year	9963	1494	3919	15376

SITUATION WITH PROJECT - MEDIUM HYPOTHESIS

Output, home consumption and losses (MT)

	Output Field L		Harv L	Home C	Mktg L	Market
	100%	20%	15%	8%	17%	52%
melon	942.2	189.7	111.0	51.3	100.0	490.2
concombre	9.0	2.3	0.3	0.5	0.9	5.0
v. melon	1375.5	275.1	165.1	74.0	146.3	714.2
tomato	692.4	157.4	51.9	30.6	70.6	373.9
okra	349.2	70.3	41.2	19.0	37.1	181.7
peppers	33.1	7.1	3.2	1.0	3.4	17.5
onion	69.0	15.3	5.0	3.0	7.1	37.0

Average gross income and losses (Fruits & vegetables, CFA000)

	Sales H.Consum		Total
	60109	7130	75239
melon	32140	3367	35507
v. melon	10742	1125	11867
tomato	10075	1094	19968
okra	1617	169	1787
peppers	1926	292	2120
onion	152700	15943	168643

Average losses (CFA000 at Farmgate prices)

	Field L	Harvest L	Mktg L	Total
	melon	26368	15394	13090
concombre	283	42	111	437
v. melon	12300	7420	6583	26390
tomato	11490	3505	5092	20167
okra	7209	4214	3799	15222
peppers	965	425	466	1856
onion	1532	564	705	2801
Total/year	60226	31652	30646	122525

FRUIT & VEGETABLE MARKETING PILOT PROJECT - CHAD

SITUATION WITH PROJECT - HIGH HYPOTHESIS

Output, home consumption and losses (MT)

	Output Field L		Harv L	Home C	Mktg L	Market
	100%	20%	10%	6%	8%	
melon	917	183	73	40	50	571
v. melon	1376	275	110	59	74	856
tomato	314	63	25	14	17	196
okra	341	68	27	15	10	212
peppers	24	5	2	1	1	15
onion	39	8	3	2	2	24

Average gross income and losses (Fruits & vegetables, CFA000)

	Sales H.Consum		Total
	126442	8706	135429
melon	126442	8706	135429
v. melon	72799	5051	77850
tomato	22591	1567	24158
okra	31769	2204	33973
peppers	2773	182	2966
onion	2985	207	3193
Total/year	258561	18008	277569

Average losses (CFA000 at Farmgate prices)

	Field L	Harvest L	Mktg L	Total
	melon	40678	16271	11812
v. melon	23384	9353	6330	39067
tomato	7256	2903	1964	12123
okra	18204	4082	2763	17049
peppers	891	356	241	1488
onion	959	304	260	1602
Total/year	83372	33349	22771	139291

SITUATION WITH PROJECT - HIGH HYPOTHESIS

Output, home consumption and losses (MT)

	Output Field L		Harv L	Home C	Mktg L	Market
	100%	25%	5%	6%	8%	
melon	25.2	6.3	0.9	1.1	1.4	35.9
concombre	9.0	2.3	0.3	0.4	0.5	13.5
tomato	378.0	94.5	14.2	16.2	20.3	522.2
okra	0.6	2.2	0.3	0.4	0.5	3.9
peppers	9.5	2.4	0.4	0.4	0.5	13.6
onion	29.7	7.4	1.1	1.3	1.6	41.1

Average gross income and losses (Fruits & vegetables, CFA000)

	Sales H.Consum		Total
	3522	244	3766
melon	3522	244	3766
concombre	1030	71	1101
tomato	26878	1865	28743
okra	797	55	853
peppers	1106	77	1183
onion	2233	155	2388
Total/year	35566	2468	38033

Average losses (CFA000 at Farmgate prices)

	Field L	Harvest L	Mktg L	Total
	melon	1429	214	306
concombre	418	63	90	570
tomato	10905	1636	2337	14878
okra	324	49	69	441
peppers	449	67	96	612
onion	906	136	194	1236
Total/year	14430	2165	3093	19687

SITUATION WITH PROJECT - HIGH HYPOTHESIS

Output, home consumption and losses (MT)

	Output Field L		Harv L	Home C	Mktg L	Market
	100%	25%	5%	6%	8%	
melon	942.2	189.7	74.3	40.7	51.0	586.5
concombre	9.0	2.3	0.3	0.4	0.5	5.5
v. melon	1375.5	275.1	110.0	59.4	74.5	856.5
tomato	692.4	157.4	39.3	29.7	37.3	428.7
okra	349.2	70.3	27.6	15.1	10.9	217.4
peppers	33.1	7.1	2.2	1.4	1.8	20.5
onion	69.0	15.3	4.3	3.0	3.7	42.8

Average gross income and losses (Fruits & vegetables, CFA000)

	Sales H.Consum		Total
	130164	9031	139195
melon	130164	9031	139195
concombre	1030	71	1101
v. melon	72799	5051	77850
tomato	49469	3432	52901
okra	32567	2259	34826
peppers	3080	269	4149
onion	5218	362	5580
Total/year	295127	20476	315603

Average losses (CFA000 at Farmgate prices)

	Field L	Harvest L	Mktg L	Total
	melon	42107	16406	11319
concombre	418	63	90	570
v. melon	23384	9353	6330	39067
tomato	10162	4538	4302	27002
okra	10528	4130	2832	17490
peppers	1340	424	337	2101
onion	1065	519	454	2038
Total/year	97802	35513	25663	158979

173

## ECONOMIC ANALYSIS (in US\$)

		YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	IRR	SENSITIVITY				
										COSTS		BENEFITS		
									100%	110%	120%	90%	80%	
<b>10 PROJECT COSTS</b>														
11	INVESTMENT	315191	95305											
12	RECURRENT	289398	319263	282513	282513	282513	282513	282513						
13	T.A. RELATED	407850	393984	180276										
<b>20 PROJECT BENEFITS</b>														
21	WITHOUT PROJECT	213365	213365	213365	213365	213365	213365	213365						
22	LOW SCENARIO	213365	340567	340567	340567	340567	340567	340567						
23	MEDIUM SCENARIO	213365	340567	556522	556522	556522	556522	556522						
24	HIGH SCENARIO	213365	340567	556522	1041490	1041490	1041490	1041490						
<b>COSTS = 11+12+13</b>														
1		1012438	808552	462789	282513	282513	282513	282513						
<b>N.BENEF = 22-21</b>														
1		-1012438	-681351	-335587	-155311	-155311	-155311	-155311	(-)	(-)	(-)	(-)	(-)	(-)
<b>H.BENEF = 23-21</b>														
1		-1012438	-681351	-119632	60644	60644	60644	60644	(-)	(-)	(-)	(-)	(-)	(-)
<b>N.BENEF = 24-21</b>														
1		-1012438	-681351	-119632	545612	545612	545612	545612	5%	0%	-4%	0%	-6%	
<b>COSTS = 11+12</b>														
1		604589	414568	282513	282513	282513	282513	282513						
<b>N.BENEF = 22-21</b>														
1		-604589	-287366	-155311	-155311	-155311	-155311	-155311	(-)	(-)	(-)	(-)	(-)	(-)
<b>H.BENEF = 23-21</b>														
1		-604589	-287366	60644	60644	60644	60644	60644	(-)	(-)	(-)	(-)	(-)	(-)
<b>N.BENEF = 24-21</b>														
1		-604589	-287366	60644	545612	545612	545612	545612	26%	20%	15%	20%	13%	

## TECHNICAL ANALYSIS

## 1. Agricultural Climatic Zones

Chad contains three distinct ecological zones : the Sudanian zone in the south where average annual rainfall ranges from 800mm. to 1200mm; the Sahelian zone in the center, with rainfall of 300mm. to 600mm.; and the Saharan zone in the north with rainfall of 100mm or less.

Agriculture is concentrated in the former two zones where production is almost exclusively rainfed in nature and is heavily geared towards primary food crops, particularly millet, sorghum, and "berbere". Cotton and groundnuts are important cash crops in the sudanian zone, as shown in the following table:

## AREA UNDER PRODUCTION AND YIELDS - 1987-88

	SAHELIAN ZONE		SUDANIAN ZONE		TOTAL	
	HA	000'S MT	000'S	HA	000'S MT	000'S
MILLET (PENICILRE)	292.5	105.0	189.3	110.4	481.8	215.4
SORGHUM	120.9	60.4	286.7	197.1	407.6	257.5
RICE	0.2	0.1	26.5	42.5	26.7	42.6
MAIZE	15.8	10.8	23.7	16.8	39.5	27.6
BERBERE	63.4	24.8	20.4	10.0	83.8	34.8
WHEAT	1.1	1.1			1.1	1.1
SUB-TOTAL	493.9	202.2	546.6	376.8	1040.5	579.0
GROUNDNUT	24.1	13.6	124.4	79.1	148.5	92.7
SESAME	8.7	2.5	27.2	7.5	35.9	10.0
COTTONSEED			147.7	127.8	147.7	127.8
SUGAR CANE			3.4	239.5	3.4	239.5
SUB-TOTAL	32.8	16.1	302.7	453.9	335.5	470
TOTAL	526.7		849.3		1376	

Source : Ministère de l'Agriculture, Direction Générale, Rapport Annuel 1987

## 2. Fruit and Vegetable Production in the Sahelian Zone

Statistical information on fruit and vegetable production in Chad is virtually nonexistent. A comprehensive survey of fruit and vegetable production is currently being carried out by BIEP under the World Bank's Rehabilitation du Secteur Agricole Programme but the results, expected to be published in late 1989, were not available at the time this paper was written.

During the 1970's, the yearly production of fruits and vegetables for the N'Djamena market was about 2,200 metric tons, according to FOA/ONADEH, Rapport terminal, Relance de la Production Fruitiere et Maraichere autour de N'Djamena, Juin, 1988. This met the needs of the city, whose population was estimated at approximately 250,000 at that time, and even allowed for some export to Europe. However, the fighting and droughts that wracked Chad, beginning in the late 1970's and

continuing through the mid-1980's, brought production of fruits and vegetables almost to a standstill. During the aforementioned period, the population of N'Djamena more than doubled, causing further and severe shortages of fresh fruits and vegetables. The shortages have been partially compensated by high-priced imports from neighbouring countries, most particularly Cameroon, but the cost and timing of those imports has served to make most fresh fruit and vegetables unaffordable and/or inaccessible to the great majority of Chadians.

In order to improve the food security situation, and given the GOC's stated priority and interest in self-sufficiency in food production, several agricultural production and diversification projects have been initiated or reinitiated, having been suspended due to the unstable civil situation. These, briefly, include the UNDP/FAO-assisted "Relance de la Production Fruitiere et Maraichere autour de N'Djamena", the World Bank's "Projet de Rehabilitation du Secteur Agricole (RSA)", the World Bank/UNDP/FAO "Developpement des Perimetres Irrigues du Chari (PIC)", the FED-assisted installation and rehabilitation of irrigation works along the Chari river, north of N'Djamena, and the USAID-financed PVO Development Initiatives Projects, of which this project will form a part.

It is important to note that all the aforementioned projects focus on agricultural production; none concern themselves or attempt to deal with the marketing of produce in excess of subsistence requirements.

To enable the Ministry of Agriculture to carry out these projects, the Office National de Developpement de l'Horticulture (ONADEH) was created in 1985, and the Office National de Developpement Rural (ONDR) was considerably strengthened.

### 3. Major Production Areas

Since fruits and, particularly, vegetables are primarily viewed by farmers as cash crops, they are mainly produced for urban markets. The main market is N'Djamena, which accounts for about 60% of Chad's total urban population. Less important urban markets and their percentage of the total urban population are Sarh (11%), Moundou (10%), Doba and Fiango, which together account for about 30% of the total urban population, and Abeche (8%) in the northeast. Production areas, therefore, tend to be concentrated within relatively easy reach of these markets.

#### URBAN POPULATION (1982 & 1988 PROJECTED)

	1975	1982	1988
N'Djamena	224000	378851	544000 **
Abeche	32000	54560	70928 *
Sarh	50000	77699	101009 *
Moundou	45000	69930	90909 *
Bongor	15700	24399	31719 *
Fiango	11100	17259	22437 *
Doba	15000	23322	30319 *
Mao	5500	9180	11934 *
Moussoro	7700	12858	16715 *

141

Source : Seminaire National sur Population et Developpement au Tchad  
 NDjamena, 10-14 Decembre 1984  
 Nations Unies, Commission Economique pour l'Afrique  
 1988\* : Mission estimates  
 1988\*\* : Enquete Legere sur les Conditions de Vie des Menages a  
 N'Djamena, Direction de la Statistique, Ministere du  
 Plan, 1988

The main fruit and vegetable production areas of the Sahelian zone are:

- the N'Djamena Sub-Prefecture of the Chari-Baguirmi Prefecture: this area produces a fairly wide range of horticultural crops through the use of mechanized low-lift irrigation along the Chari and Logone Rivers. Produce is sold in the N'Djamena market.
- the Lac Prefecture: produces, also for the N'Djamena market, a variety of vegetable crops using recessional agriculture; main production area is located along the southern shores of Lake Chad;
- the Bongor area of Mayo-Kebi Prefecture and the southern part of the Bousso Sub-Prefecture: several new low-lift irrigation projects are in operation in these areas, aimed at the diversification of traditional mono-cropping of cotton. Produce is sold mostly in the smaller urban centers of the South;
- the Mongo area of Guera Prefecture: here, fruit-trees, including mango, guava, and citrus, are important produce; this area, however, is very inaccessible by road during the rainy season;
- the Abeche area of Ouaddai Prefecture: this area produces large quantities of onion and garlic, using labor-intensive, traditional irrigation (the "shadouf system from open wells) in low-lying areas ("wadis"); production is sold on both the local and N'Djamena markets.

The year-round availability of water from the Chari and Logone rivers provides for irrigation and, therefore, a large number of farmers live along these rivers, both north and south of N'Djamena. Another major production area for fruits and vegetables is along the southern border of Lake Chad, where farmers practice recessional agriculture. This technique relies on the annual recession of the floodwaters of the lake to provide nutrients and natural fertilization for horticultural production.

Due to the pilot nature of the project, and to better insure future replicability, it was decided to focus geographically on :

(a) the fruit and vegetable production areas in Karal on the southern border of Lake Chad, and the irrigation perimeters along the Chari and Logone rivers, south of N'Djamena; and

(b) the N'Djamena market, the main urban consumer market in Chad.

#### 4. Fruit and Vegetable Production in Karal

Located on the southern shores of Lake Chad about 100 kms. north of N'Djamena, the Karal area has an economically-active population of over

142-

15,000 people. This area has tremendous agricultural potential as it possesses fertile alluvial soils and seasonal flooding with a high water table. It is substantial in size, covering some 50,000 ha. to 100,000 ha.

SECADEV has been working with farmers' groups in this area since 1982-83 and has played an important role in the resettlement in 1984 of approximately 23,000 refugees from the northern and eastern parts of the country, who were fleeing drought conditions in search of new agricultural lands.

#### 5. Profile of Producers and Groupements in Karal

As a result of SECADEV's efforts, the Karal area currently claims 103 producers' groups with a total of 1,650 members in two cantons (Assale and Mani) and sixteen villages (see appendix I.1 of this analysis) located in a sixty km. strip along Lake Chad (refer to Annex A). The number of groupements and membership is rapidly increasing and has led to the creation of federations of groupements at the village level, most notably 12 groupements with 190 members in Karal, 11 groupements with 185 members in Baltram, and 6 groupements with 72 members in Guitte.

The size of small farmer family landholdings ranges from two to five has., including recessional fields, which average one ha. to three has., and rainfed fields, averaging from one-half ha. to two has. Ownership is traditional: land is inherited by sons only; and new land is allocated to individuals or families by the village chief (chef de terre), who also serves as the deputy head of the canton. The size of each landholding and the extent to which land is cultivated is largely related to household size and the availability of family labor. Given the widespread practice of polygamy, most men have two wives and from five to twenty children. Local custom prohibits women, particularly the Hausa, from working in the fields.

SECADEV actively promotes the farming of collective fields at the groupement level. This helps provide the groupements with cash and in-kind reserves, including seeds and tools, for the next season. It further allows for communal activities such as construction of schools, and the provision of assistance to needy members. Collective fields are planted with corn, sorghum, and/or niebe only

#### 6. Production in Karal

There are three crop seasons in Karal, allowing for year-round production and multiple cropping as follows:

(a) flood recession during the rainy season from November-December to February-March, for some corn and pulses (niebe), but mainly for the cultivation of horticultural crops;

(b) flood recession using residual moisture from March to July, mainly for the production of corn;

(c) rainfall from July to October for the cultivation of corn, sorghum, pulses and tuber crops, including flood irrigation from August-September to December for rice.

As a result of these natural conditions, a wide range of crops are grown in the Karal area, including :

(a) horticultural crops: okra, tomatoes, watermelon, melon, peppers, both sweet and hot, onions, eggplant, and cucumbers, all generally grown during the flood recession period;

(b) root crops: sweet potatoes, manioc, irish potatoes, and yams, mostly grown under rainfed conditions;

(c) grains and pulses: corn, sorghum, rice, millet, niebe, and groundnuts, grown under both flood recession and rainfed conditions.

Recessional cultivation takes place as the water level in the lake gradually lowers, starting in October-November. The flat topography of the area results in large expanses being exposed or submerged, with the shore moving over 15 kms. or more between the mean high and low water levels. As a result, recessional fields may be at a distance of 5km to 15km from the village, creating a severe transport problem for both inputs and harvested produce.

Production techniques are simple, involving:

(a) seeds and cuttings from mostly local stocks, but improved or selected seeds are also supplied by ONDR or SECADEV, particularly for niebe. Procurement or availability of quality vegetable seeds is a problem;

(b) simple tools are employed, all operations being carried-out by hand;

(c) minimal use of agro-chemicals; fertilizer is not used at all as recurrent flooding and siltation apparently replenishes the soil with adequate nutrients; herbicides are not used, all weeding being done by hand although weeds present a major problem to farmers, particularly in recessional cultivation; insecticides and pesticides are not normally used, except in the event of major attacks. The use of agro-chemicals must be stringently controlled in recessional agriculture in view of the ecological impact it may have;

(d) cultivation practices consist of tillage by hoe; rudimentary nurseries for most horticultural crops; seeding and transplanting by hand with moderate attention to depth and spacing; and weeding by hoe;

(e) harvesting practices of horticultural crops are poor and present ample scope for improvement with regard to timing (maturity stage and time of the day), care in handling, and use of field containers.

The current area and volume of production in Karal is significant as per the following table:

146

## KARAL : AREA PLANTED &amp; CROP YIELDS

	PLANTED HA	HARVESTED HA*	MT	MT/HA
1988 (December 87 to May 88)				
CORN	4370	3059	8259	2.7
CORN (communal fields)	50	50	90	1.8
SORGHUM	458	458	458	1.0
OKRA	351	?	?	?
TOMATO	267	?	?	?
PEPPERS	25	?	?	?
ONION	12	?	?	?
MELON	54	?	?	?
WATERMELON	53	?	?	?
SWEET POTATO	730	?	?	?
MANIOC	64	?	?	?
IRISH POTATO	12	?	?	?
TOTAL HORTICULTURE	762	?	?	?
1988 (July to October)				
CORN	886	709	1064	1.5
CORN (communal fields)	32	32	58	1.8
SORGHUM	1932	1545	2626	1.7
SORGHUM (communal fields)	31	31	31	1.0
MILLET	994	994	795	0.8
PADDY RICE	172	125	288	2.3
GROUNDNUT	3	3	3	0.9
NIEBE (pulses)	467	?	?	?
OKRA	538	?	?	?
TOTAL HORTICULTURE	1005	?	?	?
1989 (November 88 to April 89)				
MELON	657	657	6570	10
WATERMELON	707	707	10605	15
TOMATO	292	292	1460	5
OKRA	?	?	?	?
SWEET POTATO	416	416	6240	15
MANIOC	442	442	8840	20
IRISH POTATO	6.6	6.6	152	23
NIEBE (pulses)	3351	3351	6032	1.8
TOTAL HORTICULTURE	1656	1656	18635	

\* losses due to early flooding

Source : SECADEV Compte Rendu d'Activites, 1988  
SECADEV Karal office records

The above figures indicate that Karal is one of the largest production areas of horticultural crops in Chad, with the potential to meet most of N'Djamena's vegetable requirements.

Post-harvest technology, however, is primitive due to lack of technique and know-how. Fruits and vegetables, when harvested, tend to be handled in a rough manner causing damage, loss of quality, and reduced shelf-life. Produce is generally kept in the open, without shade, from harvest till final delivery to the market. There is, practically

speaking, no grading or crop conditioning. The containers utilized as recuperation sacks, and the boxes, crates, and baskets used for the handling and transport of produce are all inappropriate, and contribute significantly to deterioration of the produce while in transit from the field to the consumer. Storage facilities for fruits and vegetables do not presently exist at present, either on the farms or in the villages. As a result, post harvest losses are extremely high, ranging from an estimated minimum 20% to 30% to total loss when, for instance, transport from the field to the farm, village, or market is unavailable.

Conservation and processing of horticultural crops is limited to sun-drying of relatively small quantities of tomatoes and okra, mainly for domestic consumption. Sliced tomato and okra are placed outside on mats to dry in the sun. The process may take two or three days, with no protection from insects or dust, which results in low quality and dirtiness.

Appendix I.2 presents data on fruit and vegetable production by Karal groupements for the 1988-89 recessional season. The data is incomplete as it is based on estimates by field agents. It should be interpreted, therefore, as indicative only and not absolute in its values. The total yield from the 5,900 has. planted with melon, watermelon, tomatoes, sweet potatoes, manioc, potatoes, and niebe (pulses) was estimated at close to 40,000 MT. This was reduced by 30% for field losses, 25% for post-harvest losses, and 10% for local consumption, for a total reduction of 65% before reaching the market. This means that only 14,000 MT or 35% eventually reached the market. It is further estimated that transport and market losses alone can reach 35%.

#### 7. Support Services:

Infrastructure in the Karal area is minimal as per the following brief description:

- Roads: a new asphalt road connecting Mani, located 20 kms. from Karal, to N'Djamena is currently under construction and should be completed in 1990. In addition, 6e.FED has budgeted ECU 2.75 million for construction of the section of the road from Mani to Karal, and ECU 1.79 million for improvement of rural feeder roads, some of which would be allocated to the Karal area. Connections between Karal and other villages is by paths which are difficult to traverse, even with 4-wheel drive vehicles, during the rainy season. Paths connecting recessional fields and villages become passable by vehicles only towards the middle of the dry season, although traffic may be impeded, even then, by "wadis", i.e. low-lying, water-logged areas.
- Electricity: there is no electricity in the Karal area. The SNV office is equipped with a small generator, while the SECADEV office uses solar power to operate their radio.
- Water: is supplied from public and private open wells in the villages. None of the wells are equipped with pumps, and water is drawn by hand with a rope and bucket.

There do not currently exist storage or processing facilities for horticultural produce in the area. SECADEV has introduced simple grain

and seed stores in several villages in connection with the groupements' grain banks. The 6e.FED program has earmarked ECU 1.83 million for the construction of 140 stores and collection centers, some of which are destined for the Karal area.

Agricultural extension and support services are provided by two ONDR agents operating at the canton level, and by SECADEV staff, which includes one coordinator, three assistant coordinators, including one for Women in Development projects, one administrator, one secretary cum radio operator, one driver and thirteen field workers. SECADEV is primarily geared towards organizing farmers into groupements for self-help programs, and assisting groupements in generating and managing their own resources. Besides providing technical advice to groupements, SECADEV also assists with the procurement of inputs, tools, and oxen carts, some of which are provided on credit.

Farmers and groupements in Karal have access to credit only from SECADEV or the funds generated within the groupements. VITA, which is the main source of small farmer credit in Chad, does not work in the Karal area.

#### 8. Fruit and Vegetable Production along the Chari and Logone Rivers

Small irrigation areas, referred to as "irrigation perimeters", along the Chari and Logone rivers have been undergoing development for the past fifteen to twenty years, mostly as a result of uncoordinated and isolated efforts by aid agencies and through private initiatives. Comprehensive data on these perimeters and the groupements which operate them does not exist; nor do estimates of the area cultivated and output. Appendix I.3 presents a schematic of thirty-eight such perimeters identified by the design mission. It is believed however, that a total of more than fifty such areas may be in existence, although not necessarily in operation.

#### Profile of Producers and Groupements

The thirty-eight groupements identified by the ACIDI design mission are spread along the Chari and, to a lesser extent, the Logone rivers and their seasonal tributaries, over a distance of 160 kms. between N'Djamena and Guelendeng. The total number of farmers in these groupements is approximately 1,858, an average of approximately fifty members per groupement.

The total gross area irrigated is 447 has., an average of about 10 has. per groupement, ranging from five has. to twenty has. Perimeters are generally subdivided into small plots or "gardens" of 0.05 ha, to 0.2 ha., operated but not necessarily owned, by individual farmers. In addition to these irrigated plots or gardens, farmers till another three to five or more hectares of rainfed land in cultivation of millet, sorghum, and groundnuts. This latter land is regarded as their main source of livelihood.

Land tenure varies considerably. Individual gardens may be considered "owned" by the farmer-operator or by an absentee owner. The garden can be sold or bequeathed, or it may be assigned to groupement members, with varying degrees of security of tenure. Different situations exist whereby local farmers owning contiguous land have formed a groupement to

buy and operate in common an irrigation pump; other situations exist where an irrigated perimeter is newly created by a project (CHARB, PIC), or where one or two larger land owners create a groupement, over which they have control, mainly as a means to attract financial assistance for the purchase of irrigation equipment and land development. The quality of each groupement in terms of the motivation and dedication of members obviously varies greatly.

#### Agricultural Production

Irrigated perimeters along the Chari and Logone rivers are primarily under vegetable production. Appendix I.4 presents a tentative estimate of such production. Data was derived from extrapolation of unreliable and incomplete sources. Horticultural crops include tomatoes, by far the dominant crop, followed by okra, onions, and peppers. Other crops grown are lettuce, eggplant, cucumber, carrots, beans, green leaves (hibiscus, gombo, manioc), melon, and watermelons. The table below summarizes production by crop of the fifty perimeters:

#### HORTICULTURAL PRODUCTION ALONG THE CHARI AND LOGONE RIVERS

		TOMATO	GOMBO	PEPPER	ONION	OTHER
ESTIMATED HA in sample		327	31	28	19	43
%		73.1%	7.0%	6.2%	4.2%	9.5%
ESTIMATED TOTAL	131%	428	41	36	24	56
Cultivated HA	40%	171	16	14	10	22
Harvested HA	65%	111	11	9	6	14
Yield MT/HA		13.8	11.6	8.8	16.5	77
Output MT		1537	124	82	105	130
%		77.7%	6.3%	4.1%	5.3%	6.6%
Less local consu	87%	1337	108	71	91	113
Less mktg. loss	75%	1003	81	53	68	85

Source : ACIDI design mission estimates based on field information

The technology employed on the irrigation perimeters is generally higher than in Karal, since groupements here rely generally on motorized pumps for irrigation. Poor maintenance, insufficient repair skills, scarcity of spare parts, resulting mainly from the uncoordinated selection of equipment, and lack of capital for the purchase of fuel result in unreliable water delivery and a very high ratio of crop failure. Similarly, maintenance of canals and individual fields is generally of a low standard, adding to the general low efficiency of irrigation perimeters. Production costs and net yields compare unfavorably to those achieved in the Karal area.

Procurement of quality seeds and cuttings is easier in this area, because of the presence of several internationally-funded projects having their own limited seed supply, and because of the proximity of ONADEH's station at Walia, where some horticultural seeds and grafted seedlings are available for purchase.

The use of small quantities of fertilizer and pesticides is more widespread here than in Karal. However, these benefits seem to be offset by salinization problems and the increasing incidence of plant

diseases, i.e. viruses and nematodes, due to the virtual monocropping of tomatoes.

Yield estimates gathered from different projects vary greatly and do not appear to be the result of accurate measurement, except in the case of N'Gaoma (CARE) and Walia (FAO):

#### ESTIMATED VEGETABLE YIELDS ALONG THE CHARI AND LOGONE RIVERS

	MT/HA	LOW	HIGH	MEAN
TOMATO		5.0	20.0	13.8
OKRA		6.0	20.0	11.6
PEPPER		5.0	15.0	8.8
ONION		15.0	19.5	16.5
EGGPLANT		8.0	15.0	12.2
CUCUMBER		6.0	19.0	11.0
LETTUCE				5.0
CARROT				12.0
HIBISCUS		1.5	5.0	3.3
MELON		5.0	10.0	7.0
WATERMELON		15.0	20.0	17.5

Source : ACIDI design mission estimates based on field information

Although yields are theoretically comparable to those of Karal, the effective output is presently considerably lower, due to the limited area under cultivation and technical problems caused by pumps and irrigation management. Vegetable production, theoretically a year-round activity in most perimeters, is, in fact, limited to the cool dry season, from December to March. This is because during the rainy season, cultivation of millet, sorghum, and groundnut takes precedence over vegetable production as suitable varieties for both the dry and rainy seasons have not been identified or propagated and are, therefore, unavailable. The changing and unpredictable course of the rivers during the dry season, moreover, may place the source of irrigation water at a considerable distance from the pump intakes.

Post-harvest technology is similar to that employed in Karal. Food conservation here is also limited to sun-drying of tomatoes and okra.

#### Support Services

Access to the perimeters by road from N'Djamena is difficult, except for those located within a twenty km. radius, due to the extremely poor condition of the main road from N'Damena to Guelendeng, numerous checkpoints and rainbarriers, and of the poor condition of secondary and village access trails which become impassable during the rains.

Villages have no electricity and depend on open wells for domestic water supply. No storage facilities for fruits and vegetables exist. Processing facilities are limited to small mechanical grain mills located in the larger villages along the main road.

Extension and agricultural support services are provided by ONADEH, ONDR, and various development agencies working with selected groupements:

- ONADEH: maintains the Horticultural Demonstration and Research Station at Walia, including a total area of thirty-seven hectares, with five hectares of irrigation canals, two of which are under cultivation. Walia maintains a staff of 3 technicians. The station produces and markets small quantities of vegetables, tests different varieties of vegetables, and operates a fruit-tree nursery producing grafted seedlings. Seeds and seedlings are for sale to farmers.

Due to severe budget constraints, ONADEH maintains only a few field agents as counterparts for development projects. It has stopped what was a limited transport service of horticultural produce to N'Djamena, which it provided to producers, after its two 5T trucks broke down.

- ONDR: this organization maintains four "Centres d'Animation Rurale", one each in Koundoul, Mailao, Mandjafa, and Guelendeng. The activities of these centers address mainly the farmers of cereal crops, to whom they provide technical advice, inputs, and training.
- Several international agencies provide technical and financial assistance to farmer groupements for the development or rehabilitation of irrigation perimeters. These include UNDP/FAO, CARE, ACRA, CHARB, CST/CISL, and several bilateral donors (see appendix I.4 for a partial list of organizations). This assistance is mostly geared towards improvement of production through technical improvements, i.e. pumps, and community development and training among producer groupements. None have so far addressed marketing in a specialized way. VITA is providing farm credit to several individuals and groupements in the area.

#### Summary of Marketing Related Constraints

Constraints identified by the design team can be summarized as follows:

##### General:

- numerous, generally uncoordinated development projects focus on improvement of agricultural and horticultural production, but none concern themselves or attempt to deal with marketing of the excess produce;
- roads are in extremely poor condition and communication is difficult;
- insufficient and unreliable transport fleet and transportation facilities;
- agricultural support services are generally weak;
- statistics are scanty and unreliable;;
- existence of a wide-spread mentality of free aid among producers;
- lack of operating capital at all levels of the marketing chain;
- the size of the N'Djamena market has more than doubled in recent years, resulting in severe shortages of fresh fruits and vegetables, partly compensated by high-priced imports, effectively making most

fresh fruits and vegetables inaccessible to the great majority of Chadians for nine months out of twelve.

Technical:

- concentration of production over short periods of time;
- inadequate harvesting practices, resulting in extremely high post-harvest losses;
- transport is slow, unreliable, and costly, both from field to farm and from farm to market
- absence of or inadequate produce conditioning and packaging facilities and technology;
- lack of food conservation and appropriate fresh-produce storage facilities and technology, both at producer and market levels.

Groupement:

- groupements have often been created primarily as a means to receive foreign assistance with an ensuing lack of motivation and self-help initiative within such groupements;
- limited management skills and experience, beginning with simple weights and measures, and including record-keeping at all levels

Marketing:

- absence of market information, including information on prices, volume handled, market behavior, and response;
- lack of effective communication systems and the resulting lack of coordination between the various elements of the marketing chain;
- low purchasing power among consumers;
- lack of information on consumer preferences, behavior, and response

### Project Components

The three major project activity components and their integral parts are presented below:

Product Technology:	Design	and adapt appropriate technologies
	Install	physical facilities
	Train	producers in improved techniques sellers in improved practices operators in maintenance of technical facilities
	Coordinate	producers' technical activities sellers' technical activities
Marketing Logistics:	Train	producers in management practices sellers in management practices
	Schedule	harvests, forecast outputs
	Implement	trial shipments
	Coordinate	production-transport-sales activities
	Negotiate	contracts with transporters contracts with sellers contracts with special buyers
Market Intelligence:	Monitor	competition (other production areas) market price variations market behaviour consumer preferences and behaviour export opportunities
	Report	compile and analyze data
	Disseminate	feedback to Logistics Unit feedback to Technology Unit publish market info bulletin

#### 1. Product Technology

Crop handling, grading, conditioning, packing, and conservation are regarded as integral parts of the marketing process, and constitute a primary concern of the project. Processing and product transformation, although not a direct marketing concern, may have to be addressed by the project, in view of the stabilizing effect those activities can have on the fresh commodity market.

Crop-conditioning measures aim at delivering to the marketplace a product which has maintained its original qualities, while at the same time enhancing its shelf-life. Accurate grading, consistent quality control, and individualized packaging would enable participating groupements to sell to specific segments of the N'Djamena market,

including supermarkets, luxury hotels, and restaurants, currently importing a large portion of their fruits and vegetables; French army bases; and the Central and peripheral markets.

In order to achieve the above, the project will create a Product Technology Unit (PTU) staffed by a long-term Product Engineer based in Karal. Equipment and materials required to devise, test, and adapt improved technologies for produce handling will be made available. The Product Engineer will be assisted by short-term consultants for specific assignments related to conditioning, storage, and conservation (2 person-months), food processing (1 person-month), and other consultancies to be determined.

During the second year, a Peace Corps Volunteer will be placed in the N'Gouma/Dagarmassa area to work with the ONADEH agent in the areas of post-harvest handling and crop storage. Volunteer inputs to be provided by Peace Corps are the following: housing fix-up, in-service training, medical care and necessities, an all-terrain bicycle or horse and access to SPA funds for any project-related activity. The project will provide any work-related materials or equipment necessary for the volunteer to carry out his/her job. The local community is expected to provide housing for the volunteer.

#### Harvesting and Produce Handling

The project will advise and train farmers in simple crop-handling techniques during and after harvest to reduce bruises, cuts, and contamination.

Harvesting flats for field packing and transport of produce to the sorting shed will be introduced in order to minimize damage. Produce will be shaded and protected during field transport by wet cloths or mat covers.

#### Conditioning, Grading, and Quality Control

Conditioning will consist mainly of washing or dry brushing, and removing field heat through dipping in cool water as soon as possible after harvest. Appropriate cooling devices will be tested and evaluated during the early stages of the project.

Produce will be sorted manually by variety, size and color/ripeness for immediate packing.

Conditioning, grading, and packing will take place at a central collection shed, built by the groupements, using local materials, with imported construction materials provided by third party contributions.

#### Packing

Packing for transport and delivery to the market needs considerable improvement. Significant losses are attributable to the use of inappropriate containers and aggravated by overloading of carriers and very difficult road conditions. Even these inappropriate containers are expensive and represent an important investment for the farmer,

ranging from CFA 400 to more than CFA 1,500 per unit.

The project, with the assistance of short-term consultants, will test containers of various designs and types for their ability to protect the produce, durability, and cost. The aim will be the introduction of standardized, product-specific packaging.

#### Food Storage and Conservation

The collection center will be equipped with simple storage facilities for produce awaiting shipment. Low-cost cooling devices, such as desert coolers, will be tested by the project to improve storage conditions and duration and to provide greater flexibility for load assembly and shipment.

The 6e.FED plans the construction of agricultural warehouses, several of which are earmarked for the Karal area. Under that program, funds will be provided to local projects for the construction, use, and management of storage depots. The ACIDI project could access those funds for a depot in Karal, which would represent a third party contribution to the project.

#### Food Processing and Product Transformation

Project interventions concerning food processing will be limited to improving existing farm and village-level processing activities, consisting in drying of tomatoes, gombo, peppers, and onion. Through the introduction of protected drying slabs, trays, a food mill, and technical advice, product quality, sanitation, and sales value will be significantly improved.

Further processing opportunities, such as production of vegetable and fruit juices and pulp, will be investigated during project implementation, particularly in light of the experience gained by three pilot processing units planned under the World Bank-assisted RSA Project.

## 2. Marketing Logistics

A Marketing Logistics Unit (MLU) will be created to coordinate production, transport, and the market. This unit will be headed up by the Marketing Advisor who will also serve as Chief of Party, with the support of two Logistics Officers, one based in N'Djamena and one in Karal.

Efficient communication through a radio network and up-to-date market information are the basic tools of the MLU, which will schedule deliveries, negotiate transport arrangements, and secure reliable outlets for the produce.

#### Coordination

Although the project does not intend to deal directly with crop production activities, direction and guidance will have to be provided to farmers with respect to production practices which affect marketing. Such guidance will mainly pertain to selection of

154

preferred varieties, harvesting and post-harvest practices, including timing and assessment of maturity, and the use of tools and crop handling techniques. The project will aim at a more even distribution of production throughout the year by scheduling crops so as to avoid peak production at the same time gluts develop on the market.

Given the absence of adequate storage facilities in the market and the absence of linkages and communication between producer and market, significant price fluctuations for vegetables and fruits occur on a seasonal, daily, and even hourly basis. The first shipment of a product or an isolated delivery to the market fetches a higher price than subsequent or consolidated deliveries. Timely deliveries, through efficient communication and coordination of logistics, will allow the project to take advantage of such price variations.

#### Transport

Coordination between producers and transporters will ensure the availability of sufficient means of transport for the timely dispatch of produce ready for the market.

Transport problems are generally considered by producers as their single most important constraint. Transport problems arise mainly out of insufficient capacity, poor condition of the fleet, poor roads, and the absence of logistical coordination and organized bargaining, and are most keenly felt in moving produce from the field to village and from the village to the market.

#### Field to Collection Point

Transport from field to collection point is a severe constraint in Karal, where fields may be as far as 10km from the village and frequently only accessible by foot on trails over difficult, marshy terrain. SECADEV has recently introduced a program for the promotion of animal-drawn carts. That program has met with slow adoption, mainly because of limited finances of the farmers.

Because quick delivery from field to conditioning center is essential, the project will investigate the feasibility of introducing on a test basis in Karal, through VITA credit, one light crawler tractor-trailer type vehicle (Bombardier) used in North America for logging operations.

#### Collection Point to Market

Several major road construction and improvement projects are currently underway or at an advanced planning stage. Once completed, they will largely remove the problems caused by the extremely bad condition of main roads.

The project will concentrate on the logistical aspects of transportation to the market by identifying reliable carriers, negotiating contracts with carriers, maintaining efficient radio communication, and by carrying out a comparative study of different transport options.

### Hired Third-Party Transport

For the Karal area, the best alternative is hired third-party transporters. Other alternatives to be tested by the project include:

- negotiated agreements with local truck and pick-up owners; these will range from occasional-hire contracts to long-term contracts involving the purchase on credit through VITA of new vehicles;
- negotiated agreements with transporters cum merchants from N'Djamena, which could involve several risk-sharing options and exclusivity clauses including outright purchase at the collection point, participation in sales profits, and leasing of vehicles by groupements. Such arrangements are now plausible due to the termination of the government's transport monopoly (CTT);
- in order to take advantage of offers by UNDP's Post-Investment - Transport Project (CHD/88/006/A/01/31), which concerns the reassignment of a part of the UN truck fleet, the options of utilizing UN trucks returning empty from the northern part of the country to N'Djamena, and direct hiring of UN trucks for crop removal during the peak production season will be explored.

### Producer-Owned Transport

In the case of the Dagarmassa/N'Gaoma area, which is within easier reach of the N'Djamena market (forty to forty-five km) over better roads, and in which groupement members have better mechanical capability, producer owned and operated transport will be tested. This transport will be financed through credit from VITA and/or in collaboration with the "Projet Cooperatif d'Organisation de la Collecte Primaire et de l'Ecoulement des Legumes par des Groupements Maraichers (Canton de Madiago), which is currently in the design stage (Ref. Ms Khadidja Abdel-Kader, for the Centre Pan-Africain de Formation Cooperatif, Cotonou).

This option will be entertained only after marketing activities in the Karal area have been well established and field experience has confirmed its viability and modality, which should occur towards the end of Year 1.

### Direct Sales

Several alternatives for direct sales by participating groupements will be investigated and tested by the project, including the following :

#### Groupements de Vendeuses (Women's Sales Associations)

Since much of the retailing of fruits and vegetables in N'Djamena is done by women, the project will investigate possibilities for organizing women who already "own" a stand in the market into groupements which would maintain special and privileged relations with the producers' associations. The unifying force of such sellers' associations would be the assured, predictable, and accurately-timed supply of quality produce at competitive, pre-established prices,

152

through the ability to bypass numerous intermediaries and middlemen.

In this regard, the project will work in collaboration with the Ministère des Affaires Sociales et de la Promotion Feminine, which has already made gestures concerning formation of such groupements.

Project activities to be undertaken in relation to formation of sellers' associations will include training in organization and management, logistical coordination and planning, and, eventually, the provision of credit through VITA for operating capital and stand improvement.

#### Wholesalers

The project will also identify selected wholesalers in the N'Djamena markets and negotiate, as far as possible, pre-arranged deliveries of larger consignments.

#### Producer-Operated Retail Outlets

For the groupements of Dagarmassa/N'Gaoma, the relative proximity of N'Djamena will allow family members of those groupements to operate their own retail outlets in town. The feasibility of this option will be assessed during the first year of the project. If viable, it will be implemented in collaboration with the Projet Cooperatif, Canton de Madiago, which plans the setting-up of such a retail outlet.

#### Contracted Deliveries to Institutions

Crop conditioning, quality control, and improved packing will give project groupements access to the more demanding market of luxury hotels, restaurants, supermarkets, and the French army base.

The project will assess, with representatives from the groupements, product specifications and quantities required, organize a promotion campaign, provide samples and delivery schedules, and assemble individual orders.

#### Market Storage

The most common complaint among wholesalers and retailers concerns the absence of adequate storage, preferably cold-storage facilities, at or near the markets for over-night storage of unsold fruits and vegetables. Several projects, including 6e.FED and CHD/83/019 Relance de la Production Maraichere et Fruitiere autour de N'Djamena, have planned the construction of modern cold-stores. None of these projects have been implemented yet.

After successful testing of the cool-rooms in Karal, the project will investigate the construction of similar installations in N'Djamena markets.

#### Trial Shipments

During the first full growing season after inception of the project, a series of fifteen trial shipments will be effected under the direction

and management of the groupements. The purpose of the trial shipments is to gain first-hand experience in dealing with the existing marketing system, and to put to test project hypotheses and techniques as outlined in this paper and further defined by market intelligence data. Systematic monitoring of shipments will be ensured by the LO's and MO.

Trial shipments will test:

- different containers and packing techniques
- different carriers and transport arrangements
- market segments and sales options.
- efficiency of communication and information network

These trials will be carried out without any risk to the producer and will be financed entirely out of project funds. Sales proceeds from the trial shipments will be put into a fund for future financing of trial shipments and other costs associated with developing improved marketing mechanisms.

### 3. Market Intelligence

The project will create a Market Intelligence Unit (MIU), based in the N'Djamena head office and staffed by one Market Intelligence Officer to be seconded by the GOC. S/he will be assisted by two full-time surveyors who will gather, process, and disseminate primary data on production trends, price variations, sales volume, pattern of shipments, market behavior, consumer preferences and purchasing habits. This market information will provide the MLU and PTU with the information required to formulate effective marketing strategies, policy, and guidelines. In addition to its data-related activities, the MIU will monitor official and unofficial trade and transport policies which inhibit free movement of goods. This information would then be used by the project, in conjunction with USAID/C to initiate policy dialogue with the GOC on how to overcome these constraints.

#### Production Trends

The MIU will monitor, from secondary data collected from other projects and agencies, production trends in those areas which supply the N'Djamena market. Indicators to be observed will include area under cultivation, type of crops and expected output, and volume and timing of likely deliveries to the market. This continuously updated database will enable the project to better schedule the crops, and time deliveries by participating groupements.

#### Market Behavior and Price Information

The MIU will gather data on price variations of the relevant commodities and shipment arrivals, including imports from neighboring countries, and will monitor reactions of the market to those deliveries. This information will allow the project to fine-tune its own transport and delivery schedules and to devise import substitution

strategies.

#### Consumer Preferences and Purchasing Power

The MIU will ascertain through periodic surveys consumer preferences, buying habits, and their purchasing power.

#### Export Opportunities

Towards the end of the first year of project operations or early in the second year, the MIU will investigate, with the assistance of a short-term consultant from the FED, export opportunities in neighboring countries and abroad.

Information to be gathered will concern:

- GOC export requirements and formalities
- importing country requirements and regulations
- relevant contacts abroad
- commodity outlook and prices abroad, including competition faced, market slots, ideal delivery periods, etc.
- shipping facilities and costs

#### Specialized Studies and Surveys

The MIU will undertake, with the assistance of short-term consultants from VOCA, FED or an independent agency, specialized studies and surveys, as required by the project's marketing operations. These might include but are not limited to:

- consumer preferences and purchasing habits
- N'Djamena market infrastructure and needed improvements
- prospects for processing fruits and vegetables
- specialized transport studies
- analysis of export possibilities for certain crops
- cold-storage

The MIU will also be provided with the services of a computer specialist for one month to set up the computerized database for the project.

## 6. Project Implementation

### Organizational Set-Up

The project will work in close collaboration with different government and private agencies, and will rely, to varying degrees, on these

institutions for actual field execution and other inputs. Those relationships will require contractual agreements which will be negotiated at the time of the pre-implementation mission, probably around November-December, 1989.

Specific organizational matters to be arranged are:

- the GOC will have to determine which government agency will be attached to the project; tentatively, the Ministry of Plan - SPONG;
- secondment, tentatively by one of the following ministries: Ministry of Commerce; the statistics division of the Ministry of Planning and Cooperation; or the Interministerial Office for Studies and Programming of one Market Intelligence Officer for the duration of the project;
- secondment, tentatively by the Ministry of Agriculture - ONDR, ONADEH, or the Direction des Statistiques Agricoles, of two Market Logistics Officers and one Monitoring Officer for the duration of the project.

Since all direct project interventions are specifically marketing-oriented, the project will work with producer groupements in Karal and Dagarmassa/N'Gaoma through and as a complement to existing production projects and extension services, for which necessary agreements will have to be reached at the time of project inception.

Specifically :

- SECADEV will have to expand the terms of reference of its field staff in Karal so that their active participation in the project's training and extension activities is ensured;
- the same will apply to the extensionists working for ONDR in Karal and ONADEH in Dagarmassa.

#### Project Time-Frame

The project will be implemented over a 30-month period starting, tentatively, in January, 1990, so as to provide for an initial installation period followed by two full cropping and marketing cycles.

#### Project Management

Responsibility for overall project implementation and coordination will be assumed by a Project Management Unit (PMU), formed by the Cooperative Marketing Advisor, the Product Engineer, their respective counterparts, and the Monitoring Officer.

The PMU, with headquarters in N'Djamena, will cover the market in N'Djamena as well as in those in Karal and Dagarmassa. The N'Djamena office will be provided with modern communication and office equipment, including short-wave radio, telex, telephone, computer, photocopier, furnishings, and fixtures. The field offices in Karal

and Dagarmassa will consist of two office rooms, two guest rooms, and amenities, and will be built by the groupement members with construction materials, office equipment, furnishings, generator, and solar collectors provided by the project.

Activities of the PMU will focus on planning and coordination, general administration, accounting, procurement, reporting, and analysis.

#### Planning

Given the virtual absence of market information, the project will adopt an iterative planning process, in which the scope and focus of marketing activities will be adjusted from season to season according to experience gained and results of monitoring of both production and market behavior.

The PMU will prepare detailed annual workplans and budgets, including seasonal activity schedules for marketing trials and logistical arrangements for actual marketing of produce.

#### General Administration, Accounting, and Procurement

The PMU, under the direction of the Chief of Party, will be responsible for the general administration and day-to-day management of the project, including recruitment and personnel management, operation and maintenance of project facilities, procurement of equipment and materials, accounting, and liaison with USAID/Chad and the GOC.

The Chief of Party will be assisted by one office manager in N'Djamena, two administrative assistants cum radio operators, one in N'Djamena and one in Karal, one secretary, one driver/mechanic based in Karal, and guards cum office boy/messenger in N'Djamena, Karal, and Dagarmassa.

#### Monitoring

Monitoring is considered an integral part of project management, providing the data required for decision-making by the PMU. The Monitoring Officer, based in Karal, will be assisted through a one-month consultancy by an M&E Specialist to set up the monitoring system.

Setting-up and initiating the monitoring system will involve:

- selection of the indicators to be monitored in order to assess project progress and impact
- determination of the parameters to be observed, and of the method and frequency of their measurement
- prescription of data presentation and formats for the technical reports to be prepared by project staff
- design of the monitoring report format

In addition to processing internal project data, the MO will undertake primary data collection from producers, groupements, transporters, and the market, as required by the MIU. To carry out these tasks, s/he will make use of the facilities and support services of the project offices.

### Reporting and Analysis

The PMU will submit quarterly progress reports to USAID/Chad in the prescribed format. These reports will be both quantitative and analytical in nature, presenting progress achieved vis-a-vis targets set out in the annual work plan and seasonal schedules, constraints faced, remedial action proposed, and plan adjustments envisioned.

Data and information generated by the monitoring function of the project, combined with periodic technical reports by project staff, will provide the basic input for quarterly reports.

End of Year 1 and pilot project completion reports:

- formulation of marketing strategy
- marketing policy recommendations
- prospective project extension and expansion

### Training & Extension

Training activities will play an important role in the project, since new practices, techniques, and technologies will be introduced to the participating groupements members. Direct project interventions will focus mainly on curriculum development, delivery of training to trainers and extension agents, and participation in extension and follow-up at the field level.

### Development of Extension Curricula

Improvements to the Existing Extension Curricula :

The project will modify the package of materials currently utilized by the extension staff, and add elements related to cropping practices dictated by market considerations, specifically:

- recommendations regarding selection of varieties, desirable product characteristics, and consumer preferences;
- recommendations regarding the cropping calendar with the aim of lengthening harvesting seasons, leveling-off of peak production periods, and spreading produce availability more evenly throughout the year;
- guidelines for harvesting, particularly the optimal maturity stage at which selected crops should be harvested to ensure maximum shelf-life, transportability, and appearance;
- guidelines for handling of produce, designed to reduce spoilage

and field losses;

- guidelines for record-keeping, management practices, and reporting procedures, as they relate to marketing, to be applied by both producers' and sellers' groupements.

These guidelines and recommendations will be formulated and tested by the project in collaboration with the extension staff, local experts, and short-term consultants.

#### Extension Innovations:

The Product Engineer and extension staff will prepare detailed curricula and training materials relating to innovative crop conditioning practices and food transformation and processing, as outlined above.

The project budget provides for the development and publication of training materials, including flip charts, posters, and hand-outs.

#### Extension:

Project staff will participate directly in the organization and delivery of training, which will consist of training of trainers, training and follow-up of participating producers and sellers, and demonstrations.

#### Training of Trainers:

The project team will begin by organizing initiation seminars in Karal for all extension staff working in the targeted area from SECADEV, ONDR, and UNDP/SNV, and in N'Djamena for women organizers from the Ministry of Social Affairs to inform them about the objectives and general plan of operations of the project, to initiate curriculum development sessions, and to outline training schedules.

Subsequently, intensive training sessions will be organized periodically by the project team, during which the curricula for farmer training will be developed and finalized, to include the design and preparation of training materials.

Four study tours to fruit and vegetable marketing facilities in Chad will be organized and financed by the project, each for three technical staffpersons and extension agents.

#### Farmers/Participants Training and Follow-up:

Information sessions will be organized by the project team to brief all groupement members about project objectives and proposed activities. Feed-back from participants will be incorporated into the curricula design and training schedules.

Curricula will be delivered by the extension agents during regular groupement meetings, with the periodic participation of project staff for the purpose of on-the-job training of trainers.

16/2

Field visits by selected groupement members, in groups of 10 to 12 persons each, for a total of about 100 person-days, to other relevant projects in the area will be organized periodically by the project.

**Demonstrations:**

Field-days and demonstrations of recommended techniques and practices will be organized by the project for approximately four crops at four sites during two seasons per year, and will be timed so as to immediately precede application of recommended techniques by the members.



## DETAILED COST ESTIMATE WITH BUDGET NOTES

<u>LINE ITEMS</u>	<u>YEAR I</u>	<u>YEAR II</u>	<u>YEAR III</u>	<u>TOTAL</u>
SALARIES (501-999)	91,350	95,918	50,357	237,625
POST DIFFERENTIAL (502-999)	22,838	23,980	12,589	59,407
PAYROLL ADDED COSTS (505-999)	27,634	29,018	15,236	71,888
ALLOWANCES (510-999)	105,210	80,042	42,024	227,276
TRAVEL, TRANSPORTATION, & PER DIEM (515-999)	103,347	54,719	95,092	253,158
CONSULTANTS (520-999)	36,326	60,360	27,468	124,154
PROCUREMENT (570-999)	198,613	19,546	5,944	224,103
OTHER DIRECT COSTS (590-999)	220,801	219,682	109,678	550,161
SUBTOTAL	806,119	583,265	358,388	1,747,772
INDIRECT COST 39.0% of Subtotal (see attached Cost Rate Agreement)	314,386	227,473	139,771	681,631
<b>TOTAL AID PROJECT COSTS</b>	<b><u>1,120,505</u></b>	<b><u>810,738</u></b>	<b><u>498,159</u></b>	<b><u>2,429,403</u></b>

163

<u>LINE ITEMS</u>	<u>YEAR I</u>	<u>YEAR II</u>	<u>YEAR III</u>	<u>TOTAL</u>
<b>SALARIES</b>	<b>91,350</b>	<b>95,918</b>	<b>50,357</b>	<b>237,625</b>
Marketing Specialist 30 person months @ \$48,300/year 5% Increase per Year	48,300	50,715	26,626	125,641
Product Engineer 30 person months @ \$43,050/year 5% Increase per Year	43,050	45,203	23,731	111,984
<b>DIFFERENTIAL</b>	<b>22,838</b>	<b>23,980</b>	<b>12,589</b>	<b>59,407</b>
Marketing Specialist 25% of Base Salary	12,075	12,679	6,656	31,410
Product Engineer 25% of Base Salary	10,763	11,301	5,933	27,997
<b>PAYROLL ADDED COSTS</b>	<b>27,634</b>	<b>29,018</b>	<b>15,236</b>	<b>71,888</b>
Retirement 10% of Base Salaries	9,135	9,592	5,036	23,763
Health Insurance \$709 Per Advisor/Year X 2 Advisors	1,418	1,489	782	3,689
Life Insurance 1.8% of Base Salary	1,644	1,726	906	4,276
Work. Compensation 5.50% of Base Salary & Post Differential	6,280	6,594	3,462	16,336
Unemployment Insurance \$525 Per Advisor/Year X 2 Advisors	1,050	1,103	578	2,731
Liability Insurance 0.19% of Base Salary	174	183	96	453
FICA 7.5% of Base Salary	6,860	7,203	3,782	17,845
Long Term Disability 0.9% of Base Salary	822	863	454	2,139

<u>LINE ITEMS</u>	<u>YEAR I</u>	<u>YEAR II</u>	<u>YEAR III</u>	<u>TOTAL</u>
Medevac Insurance \$125 Per Advisor/Year X 2 Advisors	250	265	140	655
<b>ALLOWANCES</b>	<b>105,210</b>	<b>80,042</b>	<b>42,024</b>	<b>227,276</b>
Temporary Quarters Allow. \$100/Day X 4 Adults & 3 children for 60 Days	31,500	0	0	31,500
Housing Allowance - N'DJ 28 months at \$2,100 month	<sup>10</sup> 21,000	<sup>12</sup> 26,460	<sup>6</sup> 13,892	61,352
Housing Allowance - Karal 28 months at \$1,000 month	10,500	13,230	6,948	30,678
Education Allowance \$11,000/year X 2.5 yrs X 3 children	34,650	36,383	19,100	90,133
Storage Allowance \$1,800/Year X 2 Advisors	3,780	3,969	2,084	9,833
Miscellaneous Allowances Curtains, Fix-up, etc. \$1,800 X 2 Advisors	3,780	0	0	3,780
<b>TRAVEL, TRANSPORT AND PER DIEM</b>	<b>103,347</b>	<b>54,719</b>	<b>95,092</b>	<b>253,158</b>
<b>A. TRAVEL</b>	<b>21,950</b>	<b>35,501</b>	<b>18,754</b>	<b>76,205</b>
To/From Post, Marketing Spec. 2 Adults & 1 Child from U.S. to N'Djamena \$1,800 Each Way	5,670	0	5,954	11,624
To/From Post, Product Engineer 2 Adults & 2 Children from U.S. to N'Djamena \$1,800 Each Way	7,670	0	8,054	15,724
Home Leave/R & R 7 RT Tickets @ \$3,750/Ticket from N'Djamena to U.S.	0	26,460	0	26,460
ACDI Supervisory Travel 2 RT Tickets/Year X \$3,750/Ticket	7,560	7,938	4,167	19,665

165

<u>LINE ITEMS</u>	<u>YEAR I</u>	<u>YEAR II</u>	<u>YEAR III</u>	<u>TOTAL</u>
Miscellaneous Costs \$500 X 2 Advisors	1,050	1,103	579	2,732
<b>B. PER DIEM</b>	<b>20,759</b>	<b>19,218</b>	<b>12,669</b>	<b>52,646</b>
ACDI Supervisory Travel 42 Days/Yr. @ \$120 Per Day	5,072	5,326	2,796	13,194
In-Country Travel \$37/Day X 360 Days	13,230	13,892	7,293	34,415
Pre/Post Departure Briefings 4 Adv/Spous for 5 Days X @ Avg. Cost of \$117 Per Day	2,457	0	2,580	5,037
<b>C. TRANSPORTATION</b>	<b>60,638</b>	<b>0</b>	<b>63,669</b>	<b>124,307</b>
Airfreight to/from Post 3500 lbs. net for 2 Advisors X \$8.65 Cost/Lb.	60,638	0	63,669	124,307
<b>CONSULTANTS</b>	<b>36,326</b>	<b>60,360</b>	<b>27,468</b>	<b>124,154</b>
VOCA Consultant Fees	0	0	0	
VOCA Volunteer Travel 4 RT Year 1, 4 RT Year 2 X \$4,000/ticket	16,000	16,800	0	32,800
Per Diem 4 Months Yr 1, 4 Mon. Yr 2 X \$115 /day	6,556	6,884	0	13,440
Miscellaneous Visa, Commun., Taxis, etc.	700	735	0	1,435
VOCA Staff Costs	2,878	3,180	0	6,058
VOCA Indirect Costs	10,192	10,763	0	20,955
Mid-term Evaluation	0	21,998	0	21,998
Final Evaluation	0	0	27,468	27,468

<u>LINE ITEMS</u>	<u>YEAR I</u>	<u>YEAR II</u>	<u>YEAR III</u>	<u>TOTAL</u>
<b>PROCUREMENT</b>	198,613	19,546	5,944	224,103
Vehicles	109,620	0	0	109,620
3 Four wheel drives X \$30,000				
6 125 cc Motos X \$2,400				
Computers	11,550	0	0	11,550
Office Equipment	19,346	656	0	20,002
Office Furniture	12,632	6,762	0	19,394
Office Supplies	9,450	9,923	5,209	24,582
Other Equipment/Supplies	4,515	2,205	735	7,455
Household Furniture/Applicances	31,500	0	0	31,500
<b>OTHER DIRECT COSTS</b>	<b>220,801</b>	<b>219,682</b>	<b>109,678</b>	<b>550,161</b>
Construction/Building Materials	21,735	8,505	0	30,240
Local Salaries & Benefits	73,212	76,825	39,890	189,927
Prototypes(Trial Shipments)	14,385	15,104	7,930	37,419
Trial Shipments	5,250	7,718	3,308	16,276
\$1000 each X 5 in YR. 1,				
7 YR. 2 & 3 YR. 3				
Office rent/utilities (@2000/mo)	25,200	26,460	13,892	65,552
Communications	23,100	24,255	12,734	60,089
Vehicle Maintenance/Insur.	40,320	42,336	22,226	104,882
Motorcycle Maintenance/Insur.	3,413	3,584	1,882	8,879
Office Maintenance Costs	1,087	1,141	600	2,828
0.05 % X Total				
Equipment Maintenance Costs	7,114	7,470	3,922	18,506
0.09 % X Total				
Vehicle Rental Costs	4,200	4,410	2,310	10,920
Miscellaneous Costs	1,785	1,874	984	4,643

85957

114480

1.76219

276295

**BUDGET EXPLANATION****SALARIES**

Proposed ACDI field personnel include a full-time Marketing Specialist/Chief of Party at \$48,300 per year and a Product Engineer at \$43,050 per year. The 5% annual increase projected for the proposed ACDI personnel is in accordance with the ACDI Personnel Policies and Procedures Manual. Salary increases will be awarded in accordance with performance as determined in an annual performance review by the Vice-President/Africa Region.

**POST DIFFERENTIAL**

Post Differential has been calculated according to Standard Regulations of U.S. A.I.D. which is 25% in Chad.

**PAYROLL ADDED COSTS**

Projections are based on current costs and ACDI's Personnel Policies and Procedures Manual. They correspond with benefits currently being provided to ACDI advisors overseas.

**ALLOWANCES**Temporary Quarters

This has been budgeted for sixty days at a rate of \$100/day for both advisors and families and covers the cost of living until permanent housing can be found and set-up.

Housing

This line item has been calculated at \$2000/month in N'Djamena which includes rent and utilities and \$1000/month in Karal which includes rent and repair/fix-up costs.

Education

This covers the cost of education for three children at \$11,000/year for two and one half years.

Storage

Both advisors will place HHE in storage in the U.S. at a rate of \$1900/year.

Miscellaneous

This line item includes costs for fix-up, installation of air conditioners, voltage stabilizers, curtains and limited appliances for two advisors.

**TRAVEL**To/From Post

Based on current round-trip ticket price from Chicago to N'Djamena.

Home Leave

Home Leave or R & R, depending on USAID/C regulations, will be taken in year two for both advisors and families at a rate of \$3750/ticket.

ACDI Supervisory

Two supervisory trips a year will be made by ACDI/W staff for project monitoring and supervision.

Miscellaneous

This item includes any extra transport expenses while in transit for taxis, airport taxes, visas, etc., incurred during the life of the project.

**PER DIEM**ACDI Supervisory

Per diem is budgeted for a total of 42 days per year at \$120/day for supervisory visit to the field.

In-Country

This line item is budgeted for 140 days of local staff travel to N'Djamena at a rate of \$37/day and 140 days travel to Karal at a rate of \$20/day. Local staff will spend about half their time traveling to other sites to collect data, confer with other officers and coordinate activities. 80 days of supervisory travel by the expatriate advisors at \$60/day are estimated.

Pre/Post Briefing

Each advisor will spend a total of five days in Washington, D.C. for briefings before beginning and after completing their assignments and during their home leaves.

**TRANSPORTATION**Airfreight

This line item covers the cost of shipping 3500 lbs. of personal household items, furniture/ appliances and consumables for two advisors. Given the long time-period (5-6 months), high expense, and logistical difficulties in surface shipment of household effects and consumables, it is expected that all goods will be shipped by air to Chad. Costs for air and surface shipment to Chad are quite similar (\$6.35 by surface and \$8.65 by air).

**CONSULTANTS**Fees

No consultant fees are foreseen as all short-term consultants will be volunteers from the VOCA farmer-to-farmer program.

Travel

Four round-trip tickets in year one and four round-trip business class tickets in year two at a cost of \$4000/ticket have been budgeted for eight consultants.

Per Diem

This line item has been calculated at \$51/day for 30 days for eight consultants over the life of the project. This figure is based on per diem rates in Karal of \$25/day and in N'Djamena of \$117/day.

Miscellaneous

Miscellaneous costs of \$100 per consultant include printing, secretarial service, visas, taxis, etc.

VOCA Staff Costs

This line item covers the cost of VOCA staff time on recruitment and supervisory visits as well as fringe benefits and other direct costs.

VOCA Indirect Costs

VOCA charges 39% on total direct costs to cover indirect project costs.

---

Mid-term Evaluation

Costs included in this mid-term evaluation at 15 months are: fees for two consultants at \$200/day for 18 days; per diem at \$115/day for 25 days for two advisors; two round-trip tickets at \$3200/ticket and four days at \$200/day for two advisors to finish the report back in the U.S.

Evaluation

End of project evaluation includes the fees for two advisors at \$200/day for 25 days; per diem at \$115/day for 32 days for two advisors; two round-trip tickets at \$3200/ticket and six days for two advisors to finish the report back in U.S.

**PROCUREMENT****A. Vehicles**

Three four-wheel drive pick-ups for project advisors and short-term consultants and six motorcycles for project officers and extension agents have been budgeted.

172

**B. Computers**

One personal computer with software and printer at \$8000 is budgeted for the N'Djamena office. In Karal, a laptop computer with printer is budgeted for \$3000.

**C. Office Equipment**

This line item includes an SSB radio at \$12000, which will be hooked up at all three sites; a photocopier at \$3000 and manual mimeograph at \$1800; three typewriters at \$500 each; and six desk calculators at \$125 each.

**D. Office Furniture**

\$19,400 has been budgeted for all three years to furnish the three field offices (see Annex L for detailed list).

**E. Office Supplies**

This line item will cover recurrent office costs such as computer disks, paper, stencils, stationary, ink, repair costs, etc. for three offices during the life of project.

**F. Other Equipment/Supplies**

Solar panels, accumulator, and generator will be bought for Karal and Dagarmassa offices at an estimated cost of \$7455.

**G. Household Furniture/Appliances**

\$31,500 has been budgeted for local procurement by the two advisors to buy household furniture and appliances.

**OTHER DIRECT COSTS****A. Construction**Office/Guest Rooms

Given the lack of infrastructure at these two sites, buildings will have to be constructed to accommodate office personnel and short-term consultants. In Karal, a 70 sq/m building at \$90 per square meter has been budgeted and a 50 sq/m building at \$90 per square meter in Dagarmassa in Yr.2.

Processing Shed

This will cover the cost of materials to construct a shed for small-scale processing of produce in Karal. Estimated cost of a 60 sq/m building at \$50 per square meter.

Well & Holding Tank

Estimated cost for well and storage tank in Karal is \$6000. This would serve office, processing and conditioning sheds, and guest rooms for consultants.

Storage Rooms

Two storage rooms with an estimated cost of \$60 sq/m for a 50 sq/m area have been budgeted for Karal and Dagarmassa. This will store produce waiting for pick-up to N'Djamena.

Conditioning Shed

Two conditioning sheds in Karal and Dagarmassa will be constructed for the sorting, grading, and packing of produce. The estimated area in Karal is 120 m/sq with a cost of \$20 per square meter. In Dagarmassa, the shed will be 90 m/sq with the same cost of \$20 per square meter.

## B. Local Salaries

This line item includes the cost of local salaries for support staff in N'Djamena and Karal. This includes an office manager, administrative assistant/radio operators, secretaries, surveyors, driver/mechanic and guardians. Payroll added costs are based on Chad legal requirements of 40% of salary (see Annex D for detailed listing of support staff).

## C. Prototypes (Trial Shipments)

This line item covers the cost of equipment such as harvesting trays, grading tables, container, dryer and storage prototypes to be used in trial shipments (see Annex L for detailed list). A scale with weights will also be bought for use by the Marketing Officer.

## D. Trial Shipments

Fifteen trial shipments at \$1000 each are budgeted over the life of the project and will include such costs as: produce of 30 MT/shipment at \$250/ton; packing prototypes (paid for under Procurement/Commodities line item); transport costs of 30 MT/shipment at \$200/ton; 90 person/days at \$9/day for handling; and 5% for incidental costs.

## E. Office Rent/Utilities

\$2100/month is budgeted for rent and utilities of base office which is the prevailing rate in N'Djamena.

#### F. Communications

This includes \$7000 for radio license, fees of \$250/month for telex and telephone rental, and \$1000/month for telephone, telex, copying, printing, etc. The frequent use of short-term consultants will occasionally necessitate the hiring of a temporary secretary to assist with the increased volume of report typing and formatting.

#### G. Maintenance Costs

Maintenance costs for three four-wheel drive vehicles have been calculated at a rate of \$.40/km with an estimated travel log of 32,000 km/year. Motorcycle maintenance costs are \$.15/km at 6,500 km/year. Building maintenance costs are budgeted at 5% of capital cost and equipment maintenance at 9% per year.

#### H. Vehicle Rental Costs

\$4200 per year has been budgeted for the occasional rental car, trucks, and/or taxis that will be needed for short-term consultants.

#### I. Miscellaneous Costs

##### Bulletin Publication

Covers materials and publishing cost of monthly fruit and vegetable commodity bulletin to be put out by project. \$100/month for two years is the estimated cost.

##### Physical Examinations

Four physicals for LT advisors and spouses at \$100/each and two physical for children at \$50/each have been budgeted in this line item.

#### INDIRECT COST

ACDI charges 39% on total direct costs to cover indirect project costs (please see attached Cost Rate Agreement).

171

DEC 08 1988

AGENCY FOR INTERNATIONAL DEVELOPMENT  
WASHINGTON, D.C. 20523

December 5, 1988

Mr. Donald R. Crane, Jr.  
Senior Vice President  
Management Services  
Agricultural Cooperative Development International  
50 F Street, N.W., Suite 900  
Washington, D.C. 20001

Subject: Negotiated Indirect Cost Rate Agreement

Dear Mr. Crane:

The Overhead and Special Costs and Contract Branch of the Procurement Support Division within the Office of Procurement is the central organizational component authorized to negotiate indirect cost rates with concerns awarded contracts, grants, or cooperative agreements by the Agency for International Development.

In accordance with discussions between you and Ray Hogan on December 1, 1988, we are transmitting the A.I.D. Negotiated Indirect Cost Rate Agreement for execution by the appropriate official in your organization.

This rate agreement will establish the fixed indirect rates for the fiscal years ending December 31, 1988 and 1989. Pursuant to AIDR 742.770, these indirect cost rates are automatically incorporated into the awards shown in Part III of this agreement.

Please execute the original and one copy of the rate agreement for return to me, and retain the other copy for your records.

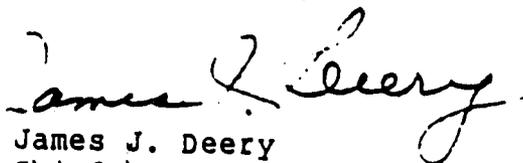
For contracts, grants, or cooperative agreements which incorporate these rates, take the necessary actions to adjust your invoices for the difference between the billed and the acceptable indirect cost rates in this agreement. However, the negotiated indirect cost rate agreement shall not change any monetary ceiling, obligation, or specific cost allowance or disallowance provided for in each award between the parties.

117

In order to assist you in preparing a proper voucher, we are enclosing a copy of "The Guidance for Contractors Regarding Vouchers Claiming Indirect Cost" Prepared by Office of Financial Management, Program Accounting and Finance Division (M/FM/PAFD). Your adherence to these instructions will enable the vouchers to be processed in a more timely manner.

Your expeditious return of the signed documents will be appreciated. If you have any questions concerning the contents of this agreement, please contact Ray Hogan on (703) 875-1101.

Sincerely yours,



James J. Deery  
Chief, Overhead and Special Costs  
and Contract Closeout Branch  
Procurement Support Division  
Office of Procurement

Enclosure:

1. A.I.D. Negotiated Indirect Cost Rate Agreement
2. Guidance for Contractors Regarding Vouchers Claiming Indirect Cost

NEGOTIATED INDIRECT COST RATE AGREEMENT

Date December 5, 1988

SUBJECT: Indirect Cost Rates for Use in Cost Reimbursement Type Agreements With the Agency for International Development (AID)

REFERENCE: Agricultural Cooperative Development International's Letter of November 10, 1988

CONTRACTOR: Agricultural Cooperative Development International  
or  
GRANTEE: 50 F Street, N.W., Suite 900  
Washington, D.C. 20001

PART I - NEGOTIATED INDIRECT COST RATES (%)

Type	Effective Period		Overhead Rate
	From	Through	
Fixed	1-1-88	12/31/88	36
Fixed	1-1-89	12/31/89	39

Base of Application

Modified direct costs excluding subcontracts, but including local currency provided by USAIDs when currency is to be planned, budgeted and administered by the Grantee in country.

Acceptance of the rate(s) agreed to herein is predicated upon the conditions: (1) that no costs other than those incurred by the grantee/contractor were included in its indirect cost rate proposal and that such costs are legal obligations of the grantee/contractor; (2) that the same costs that have been treated as indirect costs have not been claimed as direct costs; (3) that similar types of costs have been accorded consistent treatment; and (4) that the information provided by the grantee/contractor which was used as the basis for acceptance of the rate(s) agreed to herein is not subsequently found to be materially incomplete or inaccurate.

PART II - ITEMS NORMALLY TREATED AS DIRECT COSTS

PART III - SPECIAL TERMS AND CONDITIONS

Pursuant to § 742.770 of the Agency for International Development Acquisition Regulations (AIDAR), the negotiated indirect cost rates set forth in Part I of this Agreement are incorporated into AID Agreements shown below. This Agreement shall not change any monetary ceiling, obligation, or specific cost allowance or disallowance provided for in the Contracts or Grants listed below or any other Agreement between the parties.

<u>Contract/Grant Number</u>	<u>Amendment Number</u>	<u>Project Number</u>
ANE-0154-G-SS-6020-00		398-0159
PDC-0330-G-SS-6050-00		938-0192
OTR-0230-G-SS-7140-00		938-0230
OTR-0192-A-00-8241-00		938-0192

ACCEPTED: Agricultural Cooperative Development International

BY Donald R. Crane, Jr.

Donald R. Crane, Jr.

Printed or Typed Name

Senior Vice President, Mgmt. Services

Title

December 9, 1988

Date

DISTRIBUTION:

- |          |      |        |               |           |
|----------|------|--------|---------------|-----------|
| OP/OS    | OP/W | OP/W   | OTHER         |           |
| X OS/ANE | W/HP | W/CO   | X RIG/A/W     | X ANE/TR  |
| OS/IAC   | W/FA | X W/MS | X PS/SUP      | X FVA/PVC |
| OS/AFR   | W/R  |        | X PFM/FM/PAFD |           |

AID 1420-47 (8-80) back

James J. Deery  
James J. Deery

CONTRACTING OFFICER  
Overhead and Special Costs Branch  
Procurement Support Division  
Office of Procurement  
Agency for International Development

REH

## ILLUSTRATIVE COMMODITY LIST

	LOCA TION	U.COST US\$	SOURCE	UNIT	QUANTITY		TOTAL US\$		TOTAL
					Y-1	Y-2	YEAR 1	YEAR 2	
<b>EQUIPMENT - PROJECT MANAGEMENT</b>									
SSB Radio (1Base 2Sat 4Mob)N'D		12000	US	set	1		12000	0	
Telex (rental)	N'D	700	LP	unit	1		700	0	
Telephone	N'D	300	LP	unit	4		1200	0	
Computer System	N'D	3000	US	set	1		3000	0	
Photocopier	N'D	3000	US	unit	1		3000	0	
Typewriter	N'D	900	US	unit	1		900	0	
Desk calculator	N'D	150	US	unit	6		900	0	
Safe	N'D	1200	LP	unit	1		1200	0	
Air conditioner	N'D	950	LP	unit	4		3800	0	
Fan	N'D	100	LP	unit	4		400	0	
Lamp	N'D	80	LP	unit	7		560	0	
Desk	N'D	250	LP	unit	7		1750	0	
Table	N'D	150	LP	unit	3		450	0	
Chair	N'D	50	LP	unit	30		1500	0	
Filing cabinet	N'D	500	LP	unit	4		2000	0	
Shelves	N'D	150	LP	unit	5		750	0	
Miscellaneous	N'D	1000	LP	lump	1	1	1000	1000	
Laptop computer/printer	KAR	3000	US	unit	1		3000	0	
Mimeograph (annual)	KAR	1800	US	unit	1		1800	0	
Typewriter	KAR	350	US	unit	1		350	0	
Desk calculator	KAR	100	US	unit	3		300	0	
Safe	KAR	300	LP	unit	1		300	0	
Generator (12 KVA)	KAR	1900	US	unit	1		1900	0	
Solar panels/accumulator	KAR	1500	US	set	1		1500	0	
Air conditioner	KAR	600	LP	unit	3		1900	0	
Fan	KAR	100	LP	unit	4		400	0	
Lamp	KAR	80	LP	unit	4		320	0	
Desk	KAR	250	LP	unit	4		1000	0	
Table	KAR	150	LP	unit	2		300	0	
Chair	KAR	50	LP	unit	16		800	0	
Filing cabinet	KAR	500	LP	unit	2		1000	0	
Shelves	KAR	150	LP	unit	3		450	0	
Bed	KAR	350	LP	unit	3		1050	0	
Cabinet	KAR	150	LP	unit	2		300	0	
Miscellaneous	KAR	500	LP	lump	1	1	500	500	
Desk calculator	DAG	100	US	unit		1	0	100	
Solar panels/accumulator	DAG	1000	US	set		1	0	1000	
Pipe and fittings	DAG	900	LP	set		1	0	900	
Fan	DAG	100	LP	unit		3	0	300	
Lamp	DAG	80	LP	unit		3	0	240	
Desk	DAG	250	LP	unit		1	0	250	
Table	DAG	150	LP	unit		2	0	300	
Chair	DAG	50	LP	unit		10	0	500	
Filing cabinet	DAG	500	LP	unit		1	0	500	
Shelves	DAG	150	LP	unit		2	0	300	
Bed	DAG	350	LP	unit		3	0	1050	
Cabinet	DAG	150	LP	unit		2	0	300	
Miscellaneous	DAG	300	LP	lump		1	0	300	

131

## ILLUSTRATIVE COMMODITY LIST

	LOCATION	U. COST US\$	SOURCE	UNIT	QUANTITY		TOTAL US\$		TOTAL
					Y-1	Y-2	YEAR 1	YEAR 2	
<b>CONSTRUCTION - MARKETING COMPONENT</b>									<b>18000</b>
Conditionning shed	KAR	20	LP	m2	120		2400	0	
Storage rooms (40 MT)	KAR	50	LP	m2	50		2500	0	
Processing shed	KAR	50	LP	m2	60		3000	0	
Well & holding tank	KAR	6000	LP	unit	1		6000	0	
Conditionning shed	JAR	20	LP	m2		90	0	1800	
Storage room (25 MT)	JAR	60	LP	m2		30	0	1800	
<b>EQUIPMENT - MARKETING COMPONENT</b>									<b>17200</b>
Pump and fittings	KAR	1400	LP	set	1		1400	0	
Harvesting trays	KAR	3	LM	unit	100		300	0	
Grading tables	KAR	100	LM	unit	3		300	0	
Container prototypes	KAR	4	LM	unit	300		1200	0	
Storage cooler prototypes	KAR	1000	LM	unit	5		5000	0	
Dryer prototypes	KAR	500	LM	unit		5	0	2500	
Scales	KAR	1500		unit	2		3000	0	
Miscell. tools	KAR	1500	LP	loop	1		1500	0	
Scale	DAG	1500		unit		1	0	1500	

## LIST OF PERSONS MET

## GOVERNMENT OF CHAD

## MINISTERE DE L'INDUSTRIE ET DU COMMERCE

Mr Yantelbaye Director, Industry & Cooperatives  
 Mr Taymans TA, UNDP/ILO Cooperative Development Project  
 Mr Neloumra Bealbaye Counterpart

## MINISTERE DE L'AGRICULTURE

Mr Djindingar Ex-Minister of Agriculture/Current Sec of State  
 Dr Abdel Wahab Sharif Directeur Général  
 Mr Mugabe Chef, Bureau des Statistiques Agricoles

## MINISTERE DU PLAN

Mr Gelina Nguetoye Directeur General, Plan et Cooperation  
 Mr Hassana Abakoura Directeur par Interim du SPONG  
 Ms Maryam Directrice de la Planification  
 Mr Tialta Donati Directeur, Service des Statistiques

## MINISTERE DES AFFAIRES ETRANGERES

Mr M. Awada Directeur Adjoint de la Cooperation

## OFFICE NATIONAL DU DEVELOPPEMENT RURAL (ONDR)

..... Directeur Général  
 Mr Joseph Ngirimana TA, FAO Coordinateur du projet PIC, c/o ONDR  
 Mr Roger Zwijsen TA, Agronome, Prefecture Chari-Baguirmi  
 Mr Edouard Ganga Directeur, PIC Guelendeng

## OFFICE NATIONAL DU DEVELOPPEMENT HORTICOLE (ONADEH)

Mr Dabi Mabissouni Directeur Général  
 Mr Luc M'Baigangria Chef, Division Agro-Technique  
 Mr Issah Loné Programme Officer  
 Mr R. Kouma Samann Chef de la Commercialisation

## BIEP

Mr Legontrec TA, World Bank RSA Project, Fruit & Veg. Inventory  
 Mr Houdgete Isaca Counterpart

## INTERNATIONAL AGENCIES

## USAID/CHAD

Mr Bernard Wilder Representative  
 Mr Kurt Fuller Agricultural Development Officer  
 Mr Lester McBride Food for Peace Officer  
 Mr Paul Morris Economist  
 Mr Samir Zougby Human Resources Development Officer  
 Ms Charlotte Sharp FEWS Coordinator

## UNDP

M. Jalem	Deputy Resident Representative
Mr Saleh	Programme Administrator
Ms Yonkli	TA, UNIFEM Appropriate Food Technology, Processing c/o Direction des Affaires Sociales
Mr Marc Rihel	Project Assistant, Economist
Ms Thiam	Transport/Logistics (UN fleet privatization project)
Mr Metuvier	TA, OPS, UN fleet Operations Manager
Mr Boubacar Diup	Counterpart, Charge Admin/Logistique, Projet OPS

PAM	
Mr Voldemariam	PAM

FED	
Mr Orlando Henao Triana	

## NON GOVERNMENT ORGANIZATIONS

PEACE CORPS	
Mr Michael Fitzgerald	Rural Development APCD

VITA	
Mr Robert Reitemeier	Director
Mr Larry Andre	Assistant Director
Mr Haroun Sow	Agronomist, Program Officer
Mr Abdulai Adami	Agronomist

CARE/CHAD	
Mr Tom Freideberg	Director
Mr Guy Stalworthy	Agriculture Project Coordinator
Mr David Adriance	Project Chief/Sarh
Ms Joetta Miller	Community Development Officer

Mr Telumbaye Accountant	
-------------------------	--

AFRICARE	
Sid Rosenberry	Former AFRICARE N'Gueley Coop. Mgr.

ORT	
Bill Stringfellow	Project Director

ACRA	
Mr Maurice Monaye	ONDR, Counterpart, PDRI - Mandelia
Mr Winn/ Mr Nimatangar	TA, Division Analyse et programmation

SECADEV	
Mr Pierre Faure	Director
Ms Triande	Rédactrice de projets
Mr Gaoussou Boubou	Radio Operator/Secretary/Karal
Mr Moustapha Bachar	Animateur/Guitte

AICF	
Mr Mamoun	Projet Quartier Repos II

**MISCELLANEOUS**

Mr Mahamat Yakouma	Prefe de Chari Baguirni/Le Prefecture
Mr Lobdy	Chef Secteur/Prefecture Chari-Baguirni
Mr Hassane Saline	Chef de Service Adjoint de la Voirie/Mairie
Ms Khadidja Abdel Kader	Projet de commercialisation (Canton de Madiago) c/o Ministère de l'Agriculture
Ms Khadidja Kolingar	Directrice Generale/SOACIT
Mr Saleh N'Douba	President of N'Gueley Cooperative
Mr Yacoub Abdel Wahid	Market Surveyor for USAID
Mr Willy Burri	Directeur Adjoint Interim/Centre d'Horticulture et Animation Rurale de Baguirni
Mr Roger	Directeur du Projet/Centre Animation Rural de Mailou

**GROUPEMENTS**

Etena  
 Midjoug (PIC)  
 Abori (CHARB)  
 Konaye/Dando  
 N'Gueley  
 Gaoui

**FEDERATION**

Karal  
 Guitte  
 Baltram

## DOCUMENTS USED IN PROPOSAL PREPARATION

- 1) Mission de Planification/M. Taymans/Projet PNUD/BIT CHD "Developpement des Cooperatives et des Groupements a Vocation Cooperative".
- 2) Study of Irrigation Communities in Chad: Phase I & II Reports, Waldestein, Adoum, Ascher and Johnson, 31/3/88.
- 3) Program Rationale Chad/FY 1989-1994.
- 4) Future Chad Program Rationale: Suggested Points of Departure, J. Lewis May 14, 1988.
- 5) AID supported Development Strategies for Chad: A Concept Paper Prepared by: Pastore, Luzzatto, Theisen, H. Shar, Eric Johnson, Daniel, May 25-June 19, 1988.
- 6) Irrigated Agriculture: Farmer Training Baseline Social Survey, Ellen Patterson Brown, June-July 1987.
- 7) Project Paper Chad PVO Development Initiatives, June 7, 1985.
- 8) SECADEV Compte Rendu d'Activites 1988.
- 9) An Analysis of the Grain-Marketing System in Chad, DAI Feb.88
- 10) Programme National de Securite Alimentaire, Premiere Phase: Evaluation du Niveau Actuel de Securite Alimentaire au Tchad Problemes a Resoudre.
- 11) Developpement des Cooperatives et Des Groupements au Tchad, Back, Poppe et Mathez, ILO, 15 Aout, 1987.
- 12) Le Secteur Informel a N'Djamena, par C. Gerry et K. Hamida, Septembre 1988.
- 13) Projet de Rehabilitation du Secteur Agricole, ONDR et Banque Mondiale, Decembre 1988.
- 14) Relance de la Production Fruitiere et Maraichere Autour de N'Djamena, ONADEH et PNUD, Juin 1988.
- 15) Seminaire Nationale sur Population et Developpement Tchad, N'Djamena, 10-14 Decembre 1984, Nations Unis Commission Economique pour l'Afrique.

- 16) Enquete Legere sur les Conditions de Vie des Menages a N'DJ, 19 Mars - 18 Avril 1988, Direction de la Statistique des Etudes Economiques et Demographiques.
- 17) "Post-Investissement - Transport", 22 Mai 1989; Programme des Nations Unis Pour le Developpement.
- 18) Recherche d'Exportation des Cultures Vivrieres Hors Saison en Europe et le Golfe, 7 Mars, 1988 Robert Gerbaud.
- 19) Mercuriales des Legumes et Fruits au Grand Marche de N'Djamena (ONADEH), N'Djamena, 29 Fevrier 1988.
- 20) Auto-Evaluation des Perimetres Irrigues du Centre Horticole et d'Animation Rurale de Bougoumene (CHARB), N'Djamena, Juillet 1988, Genevieve Pillet.
- 21) Rapport Annuel, 1987, Ministere de l'Agriculture.
- 22) Farmer Marketing Groups and the Commercialization of Chedra Produce, November 4, 1988, L. Kent.
- 23) Projet de Developpement Agricole dans la Region de Kim au Mayo-Kebbi. Rapport de Fin de Contrat, Aout - Sept. 1988, Mascaretti et Audinet.
- 24) Formative Evaluation, USAID/Chad PVO Deve'opment Initiatives Project, May 1988.
- 25) Projet de Rehabilitation du Secteur Agricole; Etude Sur l'Expansion et la Diversification de la Production Agricole, IBRD, Fevrier 1988.