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DRIED TOMATO  
FEASIBILITY REPORT  
IN THE KARAL AREA  
(Production and Marketing)

PILOT PROJECT FOR  
FRUIT AND VEGETABLE MARKETING

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## EXECUTIVE SUMMARY

The purpose of this report is to determine the feasibility of increasing the scale of tomato drying in the project area. The underlying assumption is that farmers will find it more profitable to dry a larger portion of their tomatoes rather than dumping low quality tomatoes in the fresh market or letting them rot in the fields.

Tomatoes grown in the Karal area originate from three distinctive agro-environmental zones with different locations, harvesting times and ethnic populations. As the project area is environmentally, socio-economically and ethnically diverse and complex, so are the attitudes towards tomato drying.

There already exists a tradition of tomato drying, but on a small scale and selling limited to local markets. The drying methods and the resulting quality of the dried tomatoes is considered acceptable for local consumption, but is generally inferior to dried tomatoes from Abeche. Drying standards vary widely depending on the person's age and/or experience.

Tomato drying is generally, although not exclusively, a woman's activity. Women are involved at all stages: harvesting, cutting, selling and cooking of tomatoes. Male producers with relatively small amounts of production and who find it difficult to sell their tomatoes on the fresh market in N'Djamena may be actively involved in drying. Displaced person or members of ethnic groups that have been relocated to the producing areas often have difficulties selling and marketing fresh tomatoes in N'Djamena and seem more receptive to expanding tomato drying.

Though people know how to dry tomatoes, they have not had experience in selling them in N'Djamena and do not know the economic potential of marketing there. A significant portion of the respondents seemed very interested in drying when the price levels in N'Djamena were discussed with them.

The following are some of the major constraints mentioned by respondents in discussions about why they did not dry tomatoes in greater quantities:

- The supply of tomatoes for drying and individual access to tomatoes do not always coincide. Those who are most willing and able to dry tomatoes do not always have access to them.
- Family labor is often fully occupied with activities which are considered higher priority.
- Families find it difficult to store dried tomatoes at home until the season when prices are highest as the temptation is often great to sell the stock to meet financial obligations.

- Families are accustomed to selling their vegetables immediately after harvest and paying off debts or making necessary purchases. They feel that delaying the sale of a larger amount of dried tomatoes until prices are higher would reduce their immediate cash flow too severely.

The wholesale breakeven price, which includes the cost of production and marketing in N'Djamena, is about 3,000 CFA per sack without factoring in the cost of family labor and the cost of purchasing tomatoes. One way of viewing the relative profitability of fresh tomatoes and dried tomatoes is that based on the average of the fourth quarter 1991 dried tomatoes prices, fresh tomatoes would have to be sold at a wholesale price of 4,392 CFA per case to generate an equivalent profit.

By integrating a field program of sorting to improve the quality of fresh tomatoes shipped to N'Djamena, the better quality tomatoes will bring a better price. The remaining tomatoes can be dried and marketed later. Sacks of dried tomatoes can be stored at the Federation building in Karal and then transferred to N'djamena to be held temporarily in the Federation hangar until they are sold.

On the basis of feasibility analyses made for each community, the women's group in Sidje, was selected to receive specific technical support and encouragement to start drying more tomatoes in the course of this season.

## INTRODUCTION

The purpose of this report is to determine the feasibility of increasing the scale of tomato drying in the project area. A commercial tomato drying activity in Karal is one of the essential market related activities which can provide an economic alternative use of tomatoes not shipped to the N'Djamena fresh market. The underlying assumption is that farmers will find it more beneficial to dry a larger portion of their tomatoes rather than dumping low quality tomatoes in the fresh market or letting them rot in the fields. This alternative provides an economic incentive for farmers to do the grading and sorting in the field necessary to increase the quality of produce shipped to N'Djamena.

Previous reports had suggested that tomato drying was done on a limited scale for household use or local market sale, the dried tomatoes were of poor quality and the activity generated little interest among the local population. This report looks at the feasibility of expanding drying to make it a viable marketing alternative and an important commercial activity. It examines the amount of tomato drying being done, the methods used and the quality, extent and place of commercialization of the production. The study also attempts to determine which individuals and social groups are involved in this activity, for what reasons and which is most likely to be receptive to commercial drying. The report identifies the conditions under which commercial drying is most likely to be successful and the constraints which are likely to limit it. The analysis examines the level of existing technical knowledge, availability of labor, capital requirements and social attitudes. The report then evaluates the potential of successful commercial drying in six villages.

The information contained in this study was collected through observations, interviews and informal discussions with the project staff in Karal, farmers, women in the fields and in local market. Secours Catholique pour le Developement (SECADEV) agents located in most of the villages concerned were an important source of information. Interviews were conducted in seven of the project villages in February of 1992. At that time, only the tomatoes from the rain-fed recession basins were being harvested. Observations were made on the drying and marketing of these tomatoes, and the section on the Economics of Dry Tomato Marketing is based on data collected from this marketing period. Information presented here on the lake bed recession fields is based on reports from local farmers and from information available from last year's project activities.

Whenever appropriate, the report specifies the zones in the project area for which the information is reliable and the conclusions valid. The project area has three zones in which there are different socio-economic and production conditions.

These are mentioned when it is necessary to limit the scope of inference about the project area.

## **BACKGROUND OF TOMATO CULTIVATION AND MARKETING**

### **Profile of Production Zones**

- 1) The Karal/Baltram zone is comprised of both rain-fed flood plains (bas-fonds) primarily around Karal and lake flood plains (polders or champs de decrue) on the border of Lake Chad. Due to the shrinking of Lake Chad in recent years, lake fields are now between 3 km and 15 km from the villages. Both Karal and Baltram have reserved fields and the furthest away have set up field camps for the cultivating season. Karal-Baltram is the only zone where the early harvest (December - February) tomatoes are produced. In the March - April season, this area produces an estimated 12% - 15% of the total regional harvest. The village of Karal is primarily ethnic Arab and is the village-seat of the Canton Asale as well as the headquarters for the ACDI and SECADEV projects. Baltram is a large village of mixed Arab and resettled populations.
- 2) The Sidje/Djani/Alkouk zone, to the East of Karal, relies entirely on the lake flood plains for tomato production. The villages are between 3 km and 20 km away from the fields and many villages have established permanent satellite villages nearer to the fields. This is the major lake flood producing area. About three-quarters of the tomato production of the area comes from this zone. Some villages are ethnic Arab while others (Sidje) are composed of resettled populations.
- 3) The Mani/Guitte/Hadide zone includes both lake flood plains and riverine irrigated gardens. It is located to the West of Karal and runs along the Chari river. About 10% of the production marketed in N'Djamena comes from this region. A large portion of the production from the riverine gardens is exported directly across the river to Cameroon. The villages include Kotoko, Hausa and Arab populations.

### **Agronomic Profile**

The diversity of agronomic conditions means that the tomato cultivation systems and the timing of planting and harvesting tomatoes differs within the project zone. The recessional agricultur in the flood plains is restricted to a set and limited time during the year: December - February for the rain-fed flood plains around Karal and March - April for the lake flood plains. In both, tomatoes are first planted in nurseries and then transplanted. As the water recedes, the tomatoes reach maturity from residual soil moisture. The riverine gardens have a more flexible growing season since they are irrigated using motor pumps on the Chari River. This is important because the

time allocated for other activities must revolve around the fixed schedule of the agricultural calendar.

The most frequently grown variety of tomato in Karal is the Marmande. This moderately large, round and juicy tomato has good consumer acceptance and seeds are more readily available than varieties. The Roma variety tomato (also known as the Chinese or "contre Marmande") is also grown, but it is more difficult to find seeds in the market. In the early part of the December through February season in Karal, about a third of the Karal production is the small, sweet Cherry tomatoes. Although they have poor consumer acceptance, they mature early and enable the Karal producers to get into the fresh market in December.

Soils in all three production systems are relatively dark, fine textured and alluvial. Proportions of silt and clay vary according to the area and the production system. Their proportion also vary with depth (lake recession and Bas-fonds), with more silt and less clay on the surface. With increasing depth, the proportion of clay to silt increases.

#### **Production & Marketing History**

Tomato cultivation was introduced into the project area in 1983 and was later encouraged by SECADEV as part of its program of assistance to refugees from the 1985 drought who had been resettled in the area. About five years later, tomato surplus production had reached a level at which it became an important commercial activity for the area. As the March harvest period of the Karal tomatoes began just at the end of season for tomatoes in other producing zones which supplied the N'Djamena fresh market, wholesale prices for Karal tomatoes in N'Djamena were high. Production costs were low and the cost of transportation was more than covered by N'Djamena prices. The unmet demand for fresh tomatoes in N'Djamena enabled the producers to ignore quality and ship almost everything they could produce. Since disposing of all their produce on the N'Djamena fresh market was not a problem, there was no need to find alternative uses for surplus tomato production.

This profitability encouraged a rapid expansion of production, but with it the problem of low prices in the mid-harvest period as large quantities of Karal tomatoes reached the market. Producers have noted this problem with dismay and have attempted to control transport out of the area to reduce supplies entering N'Djamena, but this cartel type action has not been effective. The ACDI project is assisting producers in addressing the price problem by controlling the quality of tomatoes shipped to the fresh market and by providing an alternative use for the culled tomatoes such as drying.

## TOMATO DRYING IN THE PROJECT AREA

### Drying Techniques

Most people explain that they dry the small Cherry and Marmande varieties and occasionally the small Roma type if their growth is stunted for some reason. The person doing the drying generally selects the most red, overripe, split and rotting tomatoes for slicing. Some women are aware that the larger and firmer tomatoes make the best dried tomatoes, but since fresh tomatoes bring a better price, they prefer to sell them in the fresh market.

The selected tomatoes will then be sliced in the field, or if the quantity is small, they may be carried home in a basin before cutting. The majority of women said they placed the sliced tomatoes directly on the ground, a hard surface swept clean. Some said that they placed the slices on grass which grows at the field site. Others said they used plastic bags because they felt it was cleaner. Most women slice the tomatoes in two halves across the middle turning the inside up so it is exposed to the sun. The larger tomatoes are usually cut in three or four slices so that they will dry faster.

The sliced tomatoes are left to dry for a minimum of 3 to 4 days (at least in the cold/dry season) before being gathered into piles on the ground to dry a few more days. Once the tomatoes are relatively dry, the women said they would bring the tomatoes back home and leave them to dry some more on the roof of their hangar or house. Because they are exposed to wind and dust, the tomatoes are often contaminated during the drying process. The women said they attempt to get rid of some of the dirt by beating the dried tomatoes on a mat with a broom or stick.

Though most women dry tomatoes from their husband's or their own plot, some women also slice tomatoes for other people in exchange for payment in-kind. For each two basins of fresh tomatoes cut they usually receive one basin of fresh ones that they can then go sell or dry for themselves. Since selling fresh tomatoes remains the priority, the tomatoes most often selected for drying are those that are not considered appropriate for sale as fresh produce.

### Quality

Although there is generally little variation in drying methods described by the women interviewed, some of them were clearly more aware of quality issues than others and said they would be willing to do what is necessary to improve the quality of their dried tomatoes.

There is a certain amount of local knowledge concerning the best way to dry tomatoes. Some of the information on quality is listed below:

- It is better to dry on plastic sheets or straw mats
- It is better to remove the bad parts of the tomato
- Tomatoes should be sorted by size to obtain a more uniform size
- Badly dried tomatoes or those from poor quality fresh tomatoes will turn black or become moldy.

Overall, the dried tomatoes observed in the fields and in the local markets were of good quality though they are visibly different from the Abeche variety. Some cases of exceptionally bad quality tomatoes were observed being dried under highly unsanitary conditions. Some were being sold with moldy, blackened or dirty pieces mixed in with the rest. A number of the women interviewed did not seem to see the difference in quality or did not care. They claimed that they could still sell them for the same price. Because of this, the extra work involved in producing better quality dried tomatoes is discouraging without a compensating price differential.

On the other hand, certain women explained that they would only dry tomatoes that were of good quality to begin with because they were concerned with quality. They said that the tomatoes from the first and second tomato harvest periods are best for drying because the later tomatoes receive too much sun, not enough moisture and do not make good quality dried tomatoes because they will turn black after a while.

The women interviewed do not believe there is much difference in the quality of dried tomatoes from Abeche sold in N'Djamena, and the locally-dried product. Only one woman said she knew that the other variety was made with large tomatoes while the Karal variety is made with medium and small tomatoes mixed. However, she claimed that the Karal tomatoes are sweeter and she preferred them for that reason. Most women, however, seem to buy whichever dry tomato is available at the local market at the time. One woman is that the Abeche tomatoes seem to mill faster and better than the local kind which has to be passed through the machine several times.

### **Socio-Economic Profile of Persons Involved in Drying**

Tomato drying is generally, although not exclusively, a woman's activity. Women are involved at all stages: harvesting, cutting, selling and cooking of tomatoes. The harvesting and cutting of tomatoes is an activity that can be done in conjunction with child care and often assisted by the older children (over 5 years old). Women who engage in drying can organize their time around their other household chores to find time for drying tomatoes. Though it is traditionally a woman's activity, some men were

observed cutting tomatoes in the field assisted by a female member of their household, but when asked, they will not express any interest in it as an appropriate activity for men. Whatever cultural stigma may exist against men cutting tomatoes may be overcome with appropriate economic incentives.

There appears to be a difference between the older and the younger women with respect to their attitude towards tomato drying. The older women (over age 35) seem to be those most likely to engage in tomato drying as a commercial activity. They either have their own tomato plot or are allowed to gather the surplus or rejects from the plot of a male member of their family (brother or husband). It may be a source of income, primary or supplementary, to provide for their needs such as milk, tea, sugar or kola nuts. It is an activity that can be done while watching the children and/or the goats that they are responsible for. The older women tend to be more knowledgeable and experienced. Many of them have done tomato drying on and off for many years and seem aware of the need for and methods for making "good" quality dried tomatoes.

The younger married women (age 14-35) usually work more closely with and under the orders of their husband. They are more likely to have young children to care for and are very busy with household chores. Some dry the tomatoes they cannot sell fresh or are not marketed by their husband, but these women tend to be less experienced and not to care so much about quality. For many it may not be an important source of income since they are supported by their husband. Money earned from the sale of dried tomatoes is usually personal income for the woman (for clothing or items for her daughter's marriage) but may also be used for household requirements in times of need. There is even a rumor that some women do not want to help their husband earn too much money because he will use it to get another wife. Wives of the richer Arab men or particularly beautiful wives may not be allowed to work in the fields or do extra manual labor such as drying tomatoes.

### **Influence of Ethnic Traditions and Values**

The project zone is mostly composed of Arabs but with a significant number of displaced populations (primarily Hadjerais, Bilalas and Zaghawas) in the Baltram and Sidje areas and some Hausa in Guitte. Tomatoes are grown by all of these ethnic groups but their different cultural and socio-economic outlooks may influence their attitude towards tomato drying.

The Arabs are long established and have full access to land and greater production and marketing contacts in the area. Growing tomatoes seems to be a way to make some money while awaiting the main corn agricultural season. They do not appear to be willing to invest very much more time, effort and/or money in the tomato

business even if it could significantly increase their income. They appear to be reluctant to change and may place more value on social rather than economic concerns.

The displaced peoples were relocated to the area from Eastern Chad as a result of the drought of the mid 1980s. Though more economically disadvantaged and more inexperienced in a new environment, they may be more receptive to new ideas and motivated to change their habits. Although they may be in a less stable position they may also be more able to take chances since they have less to lose.

### Influence of the Farmer's Quantity of Tomato Production

There are some differences in the attitude toward tomato drying between the large and small producers, the richer and poorer producers and between the Arabs and the displaced/ relocated people. The larger or richer producers seem to have almost no interest in tomato drying. However, they will allow female members of the household to dry those tomatoes they don't want or can't sell. They focus on the fresh tomato market in N'Djamena where they feel they can make more and immediate cash. The quantities of dried tomatoes resulting from their fields tends to be a small proportion of the tomatoes they harvest.

In Sidje, Alkouk and Djani, the tomato-producing area "par excellence", it is reported that towards the end of the season tomatoes are left unharvested to rot in the fields. This is because this period coincides with the time when farmers have to start preparing their summer corn fields. Farmers claim that they do not have time themselves and cannot pay day-laborers to cut tomatoes for drying. They say their wives are too busy and they prefer to "use" them in other ways. When asked why he planted so many tomatoes, one farmer responded that it was out of habit and for lack of any better activity to do. In some cases, tomato production is considered a filler activity during the "dead time" between the corn harvest and preparing the corn fields. Many farmers seem to see tomato growing as a gamble in the hope of easy cash and with relatively little investment.

Smaller or poorer producers often do not have tomatoes in large enough quantity (only a few cases) to warrant a trip to N'Djamena and their quality may not be highly marketable. They usually sell their fresh tomatoes to the larger producer/traders at the field price (500-750 CFA) and are more apt or willing to dry tomatoes that they cannot sell. Although the total quantities may be small, the quantities that they dry may be a larger proportion of their total harvest than the large tomato producers.

Those with smaller quantities of tomatoes seem to be more willing to do drying rather than the large producers. The smaller producers of mediocre quality tomatoes and the older women who

have experience may be those most willing and apt to increase the scale of their tomato drying activity and sell in N'Djamena. However, it is also these people who have most to risk and may not be able or willing to take chances because they have less choice. The richer or larger producers have more choices and more ability to risk, but they may be unwilling because they can find adequate market for their fresh tomatoes. The socio-economic situation of the producer seems to influence his or her ability and willingness to change habits and take chances.

**Quantity**

All three zones within the project have some experience and tradition in drying tomatoes. Drying tends to be in small quantities ( a few coros) for family consumption or sale at the local markets. The table below shows the percentage of tomatoes dried in a study conducted by ACDI on tomato production of seven farmers. In the December-February period, the percentage of their own production that the farmers said was dried ranged from a high of 35% to a low of 9%. The mean was 15% and the median 14%. At the time of this study, tomato drying was only being done in the Karal zone because that was where the rain depression tomatoes were being harvested.

PERCENTAGE OF HARVEST DRIED

Farmer	Total cases Produced	Equivalent Cases Dried	% Cases Dried	Coros Dried
1	40	12	30%	66
2	70	6	9%	33
3	85	15	18%	83
4	50	7	14%	39
5	150	18	12%	99
6	20	7	35%	39
7	150	18	12%	99
Total/mean 7	565	83	15%	457

The data shown above confirms that the number of coros dried by individual families during this three month period would be used for household consumption and selling on the local market. However, if the mean of about 15% dried is applied to the estimated total Karal production of 3,196 cases during this period, the number of cases dried was 479, which based on the fresh-dry conversion rates 5.5 coros of dried tomatoes per case of fresh tomatoes observed during this period, is the equivalent of 2,635 coros or 80 sacks (33 coros per sack) of dried tomatoes.

## Marketing

Although there have been concerns about the storage life of dried tomatoes in the Karal area, the women interviewed claim that the locally dried tomatoes can keep for up to a year. This is in contrast to the information reported in the ACDI baseline study in which informants said that dried tomatoes do not store well in Karal and must be sold before prices rise later in the year. The relatively high humidity in the Lake Chad region can effect the quality of the dried tomatoes and if they are stored in a straw huts and they may not be protected from the rain. Women in Sidje suffered loss of dried tomatoes last year because of rain damage.

A certain proportion of locally dried tomatoes is sold in the local markets such as Karal, Baltram, Sidje, Gredaya, Guitte and across the river in Cameroon. In February, only the Karal market had the locally produced variety which sold for 150-200 CFA per coro and small quantities of the Abeche variety (dried tomatoes from the area of Abeche).

There is some awareness of price seasonal fluctuations of dried tomatoes on the local markets as well as in N'Djamena. Dried produce may be sold immediately or held for months until the price increases on the local market (it can reach 500 CFA per coro in the Karal market). Many people were quite aware of the high price a sack of dried tomatoes can fetch in certain months. However, in spite of the potential for making a large profit, many still declared that they were not interested in drying more tomatoes. The quantities that they dry are usually small and, therefore, not marketable in N'Djamena since dried tomatoes are sold by the sack. A sack of dried tomatoes holds an estimated 33 coros, while 1 case of fresh tomatoes makes an estimated 5.5 coros of dried tomatoes. Thus, it takes approximately 6 cases of fresh tomatoes to make a sack of dried tomatoes.

The temptation and needs to sell small portions to meet financial obligations affecting the willingness to keep dried tomatoes stored at home until the season when prices are highest. Some women say they would prefer to have ready access to small amounts of money when needed rather than have to wait for the chance of getting more money. A few older women claimed to have stored their tomatoes a few times in the past but seemed unsure about wanting to do it on a regular basis. One example was a woman who said she had sold a sack of dried tomatoes to a Kanembou merchant for 20,000 CFA who then took it to market in Tourba, Massakory or N'Djamena.

Aside from the issues of quantity and delayed returns on investment, women seem uncomfortable with the idea of going to N'Djamena market. They think that they will have to go themselves and they are intimidated by the unknown. The problem with commissioning their merchandise to others is that they usually

have no contacts in N'Djamena and are distrustful of people there. In the Guitte/Amderrabaye zone, the producers seem to be more oriented towards the markets in Cameroon and Nigeria because of their proximity to these borders.

A significant portion of the respondents who were not aware of the prices for dried tomatoes in N'Djamena seemed very interested when the price levels were discussed with them. They asked to be kept informed of such prices so that they would know when was the best time to sell.

### Economics of Dry Tomato Marketing

Underlying the project's proposed intervention to encourage farmers to dry more tomatoes is the assumption that at some price levels it is economically rational to sell dried tomatoes in N'Djamena rather than selling in the fresh market or letting them rot in the field. As a rule of thumb, when the wholesale price for fresh tomatoes in N'Djamena falls below the cost of production plus the cost of marketing, producers should switch to drying and sell in N'Djamena.

In discussions with producers on how they determine the profitability of their enterprise, most of them consider out of pocket expenses only. Although the value of family labor is not included in their financial costing, they do give it an implicit value by the priority activities to which it is assigned. The following analysis is developed without placing a monetary value on family labor to approximate the decision criteria used by producers.

In January - February, 1992, the cost of marketing a case of Karal produced tomatoes was 1,350 CFA. At that time the "Sultan's Fee" of 100 CFA had been waived. The 1,350 CFA does not include the 50 CFA per case fee that would be added for cases that did not sell the first day and were held overnight in the market for sale the next day.

#### KARAL MARKETING COST FOR FRESH TOMATOES (CASE)

Transport Fee	1,000 CFA
Commission Fee	250
Tea Case (amortized)	100
-----	
Total	1,350 CFA

In interviewing seven producers who were marketing tomatoes in the January - February season, ACDI found that a typical cost of production was about 250 CFA per case. This brought the breakeven wholesale price for a case of tomatoes to 1,600 CFA. Below this price, producers suffer a financial loss on shipments of fresh tomatoes to N'Djamena.

... the January - February period, tomatoes from Karal sold on the N'Djamena wholesale market averaged 2,256 CFA per case. The price for those that did not sell the day of arrival and had lost freshness overnight were sold the second day at an average of 1,542 CFA per case. Thus, the average arrival price was 656 CFA above the breakeven point, but average price of the holdover cases sold on the second day were just below the breakeven point.

If the farmer's decision is to not sell on the fresh market, the tomatoes can be dried and marketed until the wholesale price in N'Djamena falls to about 3,000 CFA per sack. The cost of production (6 cases fresh X 250 CFA = 1,500 CFA) plus an estimated 1,500 CFA per sack marketing cost brings the breakeven price to that level.

**KARAL MARKETING COSTS FOR DRIED TOMATOES (SACK)**

Transport	1,000 CFA
Commission Fee	250
Burlap Sack	250
-----	
Total	1,500 CFA

The financial breakeven point is only one factor in a producer's decision to market his tomatoes fresh or dry. Although the average price for fresh tomatoes from Karal was substantially above the breakeven point, the seven farmers interviewed said that they dried about 15% of their crop. The unavailability of transport to N'Djamena may be one reason they were forced to dry rather than sell to the fresh market.

**MONTHLY AVERAGE N'DJAMENA WHOLESALE PRICES FOR DRIED TOMATOES (SACK)**

( ACIDI data: Available August 1991 - March 1992)

August (1991)	10,152 CFA
September	9,380
October	9,424
November	11,021
December	12,065
January (1992)	6,806
February	5,617
March	5,333

One way of viewing the profitability of wholesaling dried tomatoes in N'djamena is to assume a wholesale price of 10,000 CFA per sack and that the producer uses 6 cases of fresh tomatoes to make up one sack of dried tomatoes. This would give the producer a profit of 7,000 CFA per sack. If the farmer

calculates his/her profitability in equivalent fresh tomatoes it would be 2,792 CFA per case. To achieve this same profit, the farmer would have to receive a wholesale price of 4,392 per case of fresh tomatoes.

**DRY TOMATO PROFITS (SACK)**

Wholesale Price	10,000 CFA
Production Cost	-1,500
Mkt Costs	-1,500
-----	
Profit per sack	7,000 CFA

**DRY TOMATO PROFITS (EQUIVALENT OF FRESH CASE)**

(6 cases fresh = 1 sack dried)  
 Profit per case = 1,167 CFA (7,000 CFA/6 cases)

**FRESH TOMATO PROFITS (CASE)**

Wholesale Price	4,392 CFA
Production	-250
Mkt Costs	-1,350
-----	
Profit per case	2,792 CFA

The analysis above shows that by using only family labor wholesaling dried tomatoes can be a highly profitable alternative marketing strategy for the Karal producers. However, case of fresh tomatoes would have to command a wholesale price of 4,392 CFA to equal the profits from dried tomatoes.

If the drying is done by a women's groupement which purchases cases of fresh tomatoes in the field at 750 CFA per case, an additional 4,500 CFA (750 CFA X 6 cases of fresh tomatoes) would have to be added to the cost of drying. This would reduce the profitability to the equivalent of 666 CFA per case.

**DRY TOMATO PROFITS (SACK)**

Wholesale Price	10,000 CFA
Mkt Costs	- 1,500
Field price (6 cases of fresh tomatoes)	- 4,500
-----	
Profit per sack	4,000 CFA

**DRY TOMATO PROFITS (EQUIVALENT OF FRESH CASE)**

(6 cases fresh = 1 sack dried)  
 Profit per case = 666 CFA (4,000 CFA/6 cases)

## FRESH TOMATO PROFITS (CASE)

Wholesale Price	2,266 CFA
Production + Mkt Costs	-1,600
-----	
Profit per case	666 CFA

Even adding in the cost of labor for drying the tomatoes, they continue to be profitable. In this situation, the wholesale price for fresh tomatoes would have to be only 2,266 CFA per case to generate the same level of profit, but drying tomatoes remains a viable economic alternative.

By integrating a program of field sorting to improve the quality of fresh tomatoes shipped to N'Djamena, the better quality tomatoes will bring a better price. The remaining tomatoes can be dried and marketed later. The Federation of Groupements has storage facilities in Karal where sacks of dried tomatoes can be stored until they are transported to N'Djamena. They can then be held temporarily in the Federation hangar until they are sold. Women can continue to store small amounts of the dried tomatoes in their household for sale when needed, or if the local market price is high enough, they can sell to local traders from Karal thus voiding the 1,000 CFA transportation cost.

## TECHNICAL AND SOCIAL FEASIBILITY

### TECHNICAL FEASIBILITY

#### Potential:

- \* **Supply of tomatoes:** It is clear that tomatoes exist in sufficient quantities in the region as a whole. The region of Karal is one of the largest tomato producers in the country in the months of March and April. There are reports that toward the end of the season some amount of "wastage" occurs in some areas with the unsold fresh tomatoes. This varies greatly from village to village.
- \* **Technical capability:** Women with the technical knowledge, experience and interest exist in most places.
- \* **Labor:** Male and female labor is available. In the case of non-household members, labor can be paid either in cash or kind. There is a precedent for women slicing tomatoes and being paid in fresh tomatoes.
- \* **Storage facilities** are available in Karal and N'Djamena. Women said that storing their dried tomatoes away from home would be helpful in reducing their temptation to sell them immediately.

\* The Federation hangar in the N'djamena Cholera market would be available for storage prior to marketing the dried tomatoes when the price is high.

\* Field Drying: Since the women would prefer to dry in the field, there is no need for the construction of a central facility for drying.

### Constraints:

\* Supply: While the overall supply of tomatoes is quite large, its distribution between localities and individuals is highly variable. The area of surplus tomatoes does not always coincide with the availability of people able and willing to do drying. Transporting the tomatoes to the area of demand would be feasible but problematic. The problem are: the cost of transportation from the area of production to the area of cutting; and by whom such cost would be borne. Women who are willing and able to do drying may not be located near the supply of tomatoes or may not have free access (i.e., through their own, their husband's or brothers's fields) to tomatoes.

\* Labor: As with time, constraints on the available labor are high and increase in April because of other competing activities. The opportunity costs of applying labor towards tomato cutting are high if the corn fields are the priority. Farmers claim that they cannot or won't pay their hired laborers to harvest or slice tomatoes for drying after a certain date in April. Women who are willing to dry for payment in cash or in-kind must be identified locally in the place of supply of tomatoes.

\* Problem of Home Storage: Some women have a problem storing in the home and waiting for prices to rise before selling their dried tomatoes. However, this could be alleviated partly through storing in Karal to reduce the temptation to sell immediately. There might also be a provision of credit to allow them to take care of their needs before the sale of their product.

### **SOCIAL FEASIBILITY**

#### Potential:

\* Interest: Because the technical feasibility and the economic motivation exist, there is a certain amount of interest in tomato drying as a commercial activity. Many people see this activity as a potential source of extra income with very little financial investment.

\* Time: Certain people are willing to organize their time in order to take advantage of the economic opportunities.

\* **Interested social groups:** Women, small producers and the displaced populations seem more interested than others. They are generally hard-working people and their lack of alternatives makes them more willing to change and try new activities.

Constraints:

\* **Social attitudes:** The Arab men, and particularly the large producers, are not willing to "demean" themselves by doing a task traditionally reserved for women. Even some of the Arab women explained that they had no time for drying and they preferred to do other things with their time even though they could sell dried tomatoes for a good price in a few months.

\* **Competing interest for limited time:** Because slicing activity in drying is a time-consuming activity people have to take time and labor away from other activities. Many chose to concentrate on other priority activities such as selling fresh tomatoes, working in the corn fields and other social responsibilities.

\* **Distrust of N'Djamena market:** Another problem with women selling in N'djamena is that many of them are intimidated and distrustful of people in N'Djamena and they will not or cannot go there themselves.

**FEASIBILITY ANALYSIS OF EACH INDIVIDUAL VILLAGE**

Because of the diversity in attitudes towards tomato drying between villages, ethnic groups and individuals, a brief feasibility analysis for each community is needed to explain the various recommendations made.

\* **Karal:** Arab population; drying being done on small scale; two women's groups members of ADERUMKA (Federation of Groupements in the project area). It may be possible to work with the women's groups there, but the supply of tomatoes may not be sufficiently abundant since Karal does not have many lake tomato fields.

\* **Baltram:** Arab and displaced populations; drying being done on a small scale, two women's groups members of ADERUMKA. More access to tomatoes than Karal but less than Sidje. Some members of women's groups were approached and seem experienced and interested.

\* **Sidje:** Displaced population (Hadjerai); drying done on a small scale. Access to large quantity of tomatoes though not necessarily in equal distribution. One women's group, member of ADERUMKA, was contacted and seems very interested, hard working, motivated and willing to invest time and money in the tomato drying business.

\* Alkouk: Arab; no women's group; large supply of tomatoes but low motivation and no organized channel through which to work.

\* Djani: Arab; no women's group. Large supply of tomatoes but low motivation and no organized channel through which to work. Contacted some women who do drying on a small scale; interest in receiving price and/or other information.

\* Mani, Guitte, Amderrabaye, Hadide: Arab, Hausa, Kotoko populations; supply of tomatoes both from lake and river gardens, but in small quantities; women's groups exist. This area seems to have been neglected by the project and was in this study as well. People contacted do some drying on a small scale. Because of their location, they seem more oriented towards markets in Cameroon than in N'Djamena. They seem interested in receiving more price information and in the prospect of marketing in N'Djamena.

Other villages in the project zone do not have significant quantities of tomatoes and, hence, are not included in this analysis.

## CONCLUSIONS

Although selling tomatoes on the fresh market in N'Djamena is a marketing priority, there is a widespread drying for household use and local marketing. There is also some "importing" of Abeche dried tomatoes for sale in local markets. This indicates that there already exists social, economic and technical rationale for drying. This should facilitate the project's work in encouraging producers to increase the quantity of tomatoes dried and marketing them in N'Djamena.

The availability of family labor and hired labor is an often mentioned issue in expanding the dried tomato industry in Karal. Men and women respondents claim that they do not have time to do more drying than is now done. There is no doubt that the time allocated for family labor and hired labor is fully occupied with activities based on the current understanding of priorities, but the storage facilities in Karal and the Federation hangar at the Cholera market reduce some of the marketing constraints. There is now the availability of storage to hold the product until prices are high. The project's assistance in providing marketing information and establishing Karal - N'Djamena marketing channels for dried tomatoes is also important in reducing some of the barriers to breaking into the market in N'Djamena. Given these changes, dried tomato marketing in N'Djamena is much more attractive than before. If the participants have an understanding the economic benefits that increased drying can bring, the labor priorities may be changed.

Although drying is done to some extent by both men and women, it is primarily a women's activity. Women are involved in all levels of drying from slicing to marketing. This provides an opportunity for the project to assist in the development of an economic enterprise managed primarily by women. To the extent possible, the project will seek to involve women's groupements and collaborate with the Federation in sharing its resources.

The women's groupement at Sidje appears to be the best location for the project to allocate its first efforts in expanding drying. The village is located in one of the major tomato producing areas where the project is encouraging sorting for the fresh market. This will provide "culls" which can be dried. The Hadjerai women are members of a groupement which is a member of the Federation and entitled to use of Federation facilities. Also, and most importantly, the women have expressed interest in a developing a drying enterprise. There is a SECADEV Community Organizer in Sidje who can assist with the organization of this enterprise.

#### RECOMMENDATIONS

- Observe the tomato harvesting process throughout the season, particularly in the area of "surplus" (Sidje, Djani, Alkouk) to determine feasibility of expanding drying.
- Work with the Sidje women's group. Offer them technical support and counseling when/if necessary. Follow through from beginning (harvesting) to end (storage).
- Survey interest and possibilities in Baltram and Karal with women's groups there.
- Monitor dried tomato wholesale prices in N'Djamena. Inform project villages and groupements on a regular basis.
- Investigate capacity of local Karal markets for sale of Karal area dried tomatoes.
- Experiment with drying methods to improve quality.
- Research:
  - technical feasibility of dried tomato milling in Karal.
  - feasibility of marketing powdered (milled) tomato in N'Djamena market.
  - investigate implications of high sugar content of Karal tomatoes for drying and milling.

List of persons interviewed:

Khamiss Ourde, ACDI, Karal ..

Farmers:

"Sakhayerom", Al Guissim  
Mahamat Oumar, Karal  
Khalia Adoum, Amderrabaye

Women involved in drying:

Hawa Oumar ( sister of Mahamat Oumar), Karal.  
Fatime Timane, member of groupement Barde, mixed Hadjerai group  
(men and women), member of AGDERUMKA, Baltram.  
Saboussa Wirel, Vice President of SECADEV women's group, Baltram.  
Adama Adoum, member of SECADEV women's group, Baltram.  
Hawa Adoum and Saloussa Moussa, Djani  
Fadai Mahamat and Kaltouma Ramadan, Djani

Fatouma Djime, President, Women's group (Hadjerai), Sidje.  
Halime Ramadan, Ouzoul Erbi, Hawa Delep, Fatime Adoum, Hamina  
Brahim, Kabine Doungouss, Members of the women's group, Sidje.  
Ache Hissein, Ache Abdullai, Kadije Souara, Mmembers not present at  
meeting.

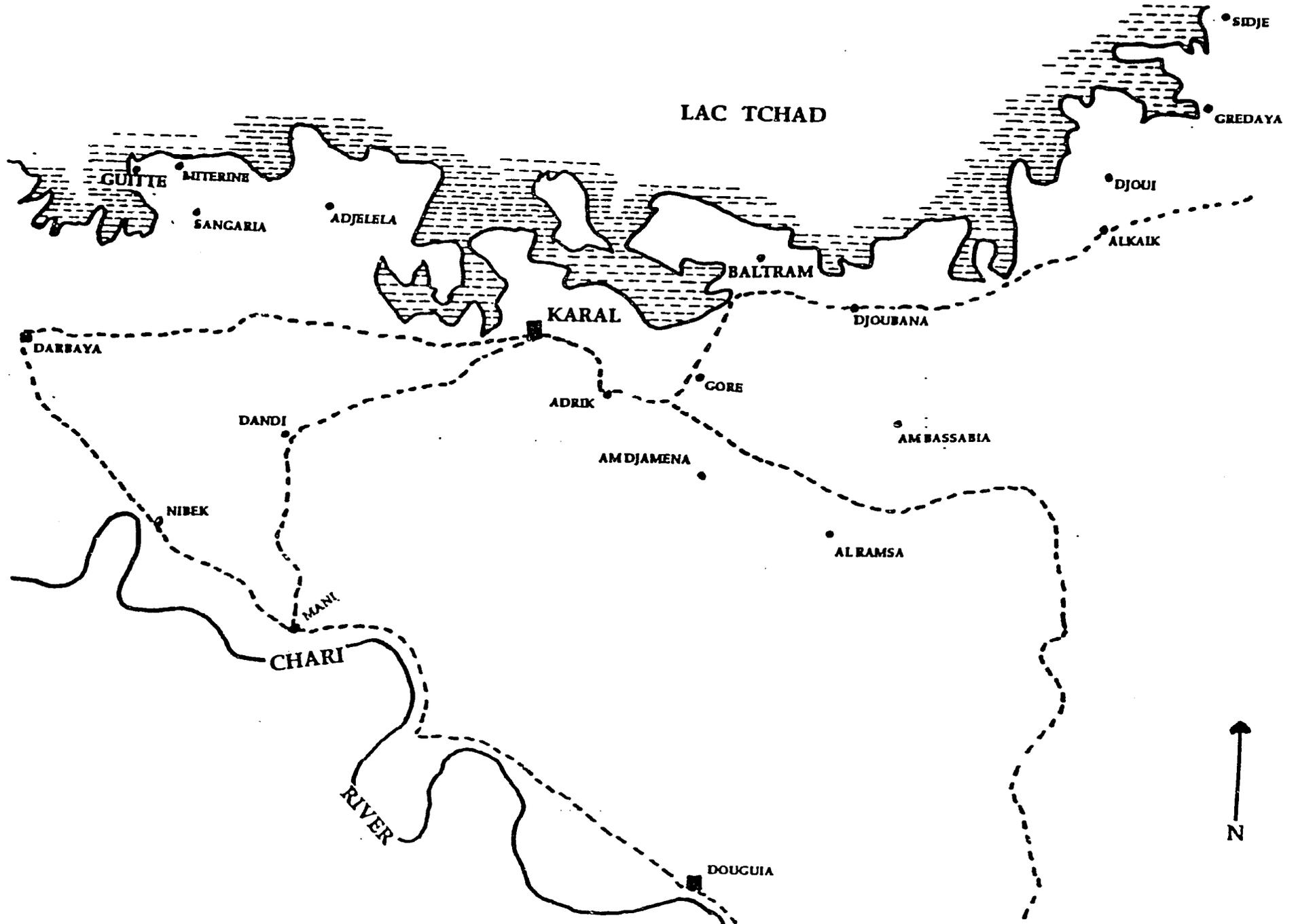
SECADEV agents:

Adele (Baltram)  
Brahim (Karal)  
Felicite (Amderrabaye)  
Mahamat (Guitte)  
Zacharia (Djani)  
Oumar (sidje)

Other advisors:

Tony Johnson  
John B. Riley

LAC TCHAD



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