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VEGETABLE MARKETING ON THE MOSSI PLATEAU OF UPPER VOLTA

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Executive Summary

The objective of this report is to give an overview of the present production and marketing systems for vegetables on the Mossi Plateau and to suggest areas where donors might intervene in the interest of strengthening those systems.

The team had a chance to visit six sites on the Mossi plateau where off-season vegetables are grown. Four of these were in the Seguenega area in the Yatenga. The other two were farther south in Koupela and Kombissiri. All but one of the sites have been under cultivation less than five years.

Land tenure is not a problem at any site since the vegetable gardens occupy the land only during the dry season when there is no competition with the usual crops grown. Gardening groups are not, however, allowed to plant fruit trees or anything other than annual crops on the land.

Water is the most frequently cited constraint on production cited by the production groups. The land is cultivated by relatively small groups of individuals. They tend to do some labor communally but generally cultivate family plots. In two sites visited, the cultivation groups organized themselves spontaneously with no outside intervention. Women are as active as men in vegetable cultivation and are able in at least one case, to cultivate personal plots. Very little credit is available to these cultivators. Extension services are available.

Overall, it is difficult to estimate annual horticultural production on the Mossi plateau. This study estimates in the order of 8,000 tons per annum of horticultural production there. Plots are small. Potatoes are the most important single crop followed principally by cabbage, onions, carrots, egg plant, lettuce, carrots and maize although not necessarily in order of importance.

The cost of production is highest for potatoes due principally to the cost for seed. None of the crops is generally fertilized other than with animal manures. No evidence of fungus, disease or serious insect infestation were seen on any of the crops. Some fungicide is used, especially on potato seed. The cost of production per ton of potatoes is in the order of 40,000 FCFA.

Cultivation and harvesting of all crops is done with labor intensive methods using hand tools.

The marketing system for horticultural crops varies according to the crop grown. Crops other than potatoes and onions tend to travel poorly. They are consumed generally within a relatively small radius of where they are produced. In fact producers interviewed in the preparation of this report maintain that marketing for horticultural crops other than potatoes presents no problem. Little is wasted. Almost all is eaten by producers, neighbors or consumers from nearby markets. Wholesaling and retailing roles in the markets are blurred, little large scale assembly takes place. The difference between producer price and consumer

Potatoes and onions come from greater distances. They are usually entered in markets at their destinations by professional wholesalers. Moreover, UVOCAM, a government controlled union of regional cooperatives, intervenes on the national potato market to some degree. One problem for potato producers on the Mossi plateau, in fact, is the uncertainty of UVOCAM intervention on the national potato market from one year to the next. Since UVOCAM has priority rights to marketing potatoes from member cooperatives, members must await UVOCAM decisions before launching a quest for marketing arrangements with independent intermediaries.

UVOCAM also has a large grossly underutilized cold storage vault adjacent to the Ouagadougou airport. At present, it prefers to carry the overhead loss of unutilized space than allow private sector actors to rent the space to store produce, principally potatoes, for the season of post harvest scarcity.

URCOMAYA is the member cooperative in UVOCAM from the Yatenga region. A recent evaluation by Oxfam of its involvement with URCOMAYA is not very optimistic. Ninety-eight percent of URCOMAYA marketing activity involves supplying green beans and potatoes to UVOCAM. UVOCAM has been, however, generally unwilling to commit itself to buying more than 10% of Yatenga potato production at most. URCOMAYA has not been able to create alternative marketing arrangements.

The principal marketing problem for dry season vegetable cultivation is a potato marketing problem. Local markets are able to absorb other vegetables produced with no significant waste or losses. Part of the problem is a locational problem. Many major production centers are too far from the biggest markets to enter those markets profitably at peak season prices. From this point of view, therefore, the problem of marketing potatoes may express itself as a storage problem. If medium term storage is, in fact, a way of solving the potato marketing problem in whole or in part, a subsidiary problem will arise of identifying a potato cultivar appropriate to the storage solution. All or this still leaves open a nagging problem of what institutions and institutional linkages are most promising in channeling potatoes from the field to the consumer.

This study makes the following recommendations:

A) <u>The following studies should be undertaken</u>:

1. demand study for vegetables to determine if increased green vegetable production is one solution to potato glut and/or if demand for potatoes is high enough to absorb increases in potato production

2. Storage cost study to see if potato prices rise enough to cover real cost of storage during season of post-harvest scarcity

B) <u>If studies show demand for potatoes and or other vegetables is unsatisfied promote increased horticultural production by:</u>

1. improve water resources.

2. expand credit opportunities to horticultural crop producers.

3. investigate improved road access to isolated crop producers.

C) <u>The following recommendations should be pursued irrespective of the results of the demand studies</u>

1. expand credit opportunities to potato wholesalers to enable them to pay producers on delivery. Also make credit available, secured by produce in storage, to private parties storing produce.

2. search for a formula permitting private access to presently underutilized UVOCAM cold storage. Do not get involved with URCOMAYA cold storage. Look for a technology that would allow on-farm potato storage.

3. try to identify potato cultivars appropriate to Mossi Plateau conditions that store well.

4. promote marketing arrangements between unaffiliated producer groups and private wholesalers. Avoid entanglement with UVOCAM and its member cooperatives.

5. top priority for the development of new horticultural product sites should be given to areas relatively close to sizeable markets.

D) <u>Certain of these recommendations can be implemented in the context of the following AID/UV projects</u>:

1. water - ADS project

2. local storage - HATT

3. suitable cultivars - ADS project

4. marketing institutions - ADS project

5. potato production - ADS projectd

II. Introduction, Methodology and Acknowledgements

The objective of this report is to present a preliminary assessment of the marketing system for vegetables produced on the Mossi Plateau in Upper Volta. The body of the report is divided into three sections. The first section presents several alternative systems of vegetable production and marketing currently in practice on the Mossi Plateau. The systems presented may very well not exhaust the alternatives in practice but they illustrate something of the range of variation. The second section provides a framework for evaluating the marketing systems for vegetables in terms of the quantity of goods sold, their geographic origins and points of consumption,horticultural practices and production costs. This section also provides an overview of public and private organizations and institutional practices which are directly involved in the marketing process.

The third section of the report focuses on defining the marketing problem as it might be addressed by USAID intervention. In this section a number of specific factors are evaluated for their impact on produce marketing.

The final section of the report contains recommendations for possible USAID intervention in the vegetable marketing sector.

The preparation for this report took place during a three week period in February, 1983. The first week was spent in Ouagadougou. It included: (1) several early morning visits to the Ouagadougou wholesale and retail vegetable markets as well as contacts with Voltan government official and parastatal marketing bodies and USAID and (2) briefings with USAID project personnel with knowledge and

experience in the vegetable marketing sector. The second week was spent in the field. The team visited vegetable production installations in several villages in the Ouahigouya area as well as in Koupela and Kombissiri. The final week of the mission was spent cleaning up details in Ouagadougou and writing the report.

As is ever the case in a report of this nature, the team owes a debt of gratitude to a number of people too large to thank individually. First of all the agricultural office of USIAD/UV has given its support in terms of time, resources and personnel. Outside the AID mission the team has been able to draw on officials in the Caisse Nationale de Credit Agricole, UVOCAM, URCOMAYA, the Direction des Institutions Rurales et de Credit, the RAN, AFRICARE among others. Finally, a large number of unnamed vegetable growers, wholesalers and retailers have been willing to take time from busy schedules to bring us along. To all of these people our thanks. We hope the report is faithful to what they have taught us.

II. Vegetable Production and Marketing

A) Social Organization of Production

1. Background - In the development of this report the team had occasion to visit six installations where vegetable are grown. Three of these were developed as part of an integrated development project of Africare headquartered in Seguenga. These installations are in Ramsa, Mogom and Seguenega,itself. A fourth installation visited, also in Seguenega, is under the direction of the "Association des 6 S" a private Voltan organization financed by a group of European-based religious foundations. The last two installations visited were built completely on local initiative with minimal outside intervention. They are in Koupela and Kombissiri.

Of the six sites visited, the group at Koupela is the oldest. It began vegetable cultivation 10 years ago. All the other five groups have been cultivating dry season vegetables less than five years.

2. Land tenure and availability of land - Land tenure has presented no problems in any of the installations visited. The key to this fact is that vegetable cultivation groups use the land only during dry season. During the rainy season the use of the land reverts to whoever had been growing staple grains on it previously (on some occasions the same persons).

In the four installation visited in the Seguenga area persons identified as owners of the land under vegetable cultivation are members of the cultivation group. Ownership is, however, a difficult concept to define in this case and may be irrelevant. The essential point is that holders of rainy season cultivation rights to plots show no reluctance to allow vegetable cultivation groups to use their land during the dry season. The rights holders profit from the venture in two ways. They actually join in the groups activities and their rainy season crops benefit from soil nutrients and residues left in the soil from dry season cultivation.

In the Kombissiri case land belongs to the ORD which is allowing a cultivation group to use it as a way of encouraging group organization and dry season vegetable cultivation. The ORD is currently negotiating with a newly formed cultivation group in Kombissiri for rights on another plot of ORD land there.

The availability of land is a function of the availability of water. At every site visited, cultivators made the point that much more land was available for dry season vegetable cultivation but that there was simply not enough water to support the effort, particularly in a dry year such as the present one.

3. Trees - One indication of the land tenure situation is the policy of planting trees on plots used by the dry season vegetable growers. Dry season vegetable cultivators are not allowed to plant trees in any of the installations visited. There are three reasons for this. First of all, trees compete with other crops for light and nutrients both in the wet season and in the dry. Second, trees take years before they bear, however profitable their fruit. Vegetable production groups have one-season planning horizons only. They are, at present, not in a position to

make longer range investments or plans. Thirdly, trees are generally owned by the person who plants them rather than the person who holds rights to the land on which they are planted. A prohibition on planting trees avoids later conflicts on access rights.

4. Water Sources - Three of the sites visited use only wells as water sources. These were the sites at Ramsa, Mogom and Koupela. The latter site uses pumps to draw water from its wells. At the former two sites, water is drawn by hand. The wells at Ramsa and Mogom are on the order of 12 to 15 meters deep. All except one is lined. At Ramsa two of the 44 wells in the installation never dry up. Otherwise, the wells at Ramsa and Mogom have constant dry season flow problems. The wells at Koupela are 4 to 5 meters deep. They are unlined. There are only three large wells there in an area about a third the size of Ramsa. However, pumping with a hose distribution system compensates for their disproportionately small number.

The two Seguenega installations supplement wells by channeling water from an adjacent reservoir into the cultivated area. Neither has pumping. Consequently, the current low water level of the reservoir has made bringing water to the installations by channel almost impossible. This has had a negative impact on vegetable cultivation in both areas. "The Association des 6 S" installation has suffered more than the Africare one as the shoreline of the reservoir has receded more at the edge of the former than the latter.

The Kombissiri installation relies entirely on pumping water through a network of hoses from an adjacent reservoir. Here, as well, the exceptional recession of the reservoir has meant portions of the installation have been left too far away from the water for adequate service.

5. Group Organization - There are people who grow vegetables on a commercial basis as individuals. This was the case for several of the people wholesaling vegetablesinterviewed at the Ouagadougou market. Most of the people who do this are probably living fairly close to a large market. They can transport their production to market by foot, or on the back of a bicycle, moped or motorcycle.

People who live farther away from a larger market must look into other organizational formulae to get their produce to market.

On all six sites visited cultivators had organized themselves into groups. Table I presents the surface cultivated and the number of families cultivating at each of the sites visited.

TABLE I

Surface Cultivated and Group Size

Site	Surface Cultivated	Group Size
Ramsa	5.5 ha	123 families
Mogom	4 ha	101 families
Associate des 6 S (Seguenega)	3 ha	60 families
Africare (Seguenega)	2 ha	30 families
Koupela	2-3 ha	12 families
Kombissiri	4 ha	14 families

At the first four sites on Table I the groups were organized with the intervention of some outside agency. The groups are relatively large and the team was not able to discover the principles on which members were selcected. The last two groups on Table I are significantly smaller and seem to be groups of village age-mates with a lifetime of social interaction behind them before deciding to undertake this activity. The initiative to form the group seems to have come from within the membership.

The group in Koupela is exceptional inasmuch as half its installation is worked as a communal field while the other part is assigned in individual family plots. All the other sites have divided the entire area into individual family plots only. Each family is allocated a plot whose size is a function of the number of able-bodied workers. In all sites some work is done communally such as fencing, channeling water, etc.

6. Womens' roles - In the "Association des 6S" site, the larger group is subdivided into smaller working groups. Several of these smaller groups are made up of women only. A woman's husband need not participate in cultivation in the installation for her to participate.

In no other site did the team encounter a situation where women were participating in cultivation in their own right. On the other hand there is no reason why groups of female age-mates could not organize in the same way as the men in Koupela and Kombissiri. It is , in fact, likely that they have done it at sites the team has not visited.

7. Credit - The four installations visited that were created directly or indirectly with outside donor intervention receive short-term in-kind credit for cultivation in-puts, principally potato seed purchase. The credit program is a component of the overall project responsible for the installation. Medium term credit within the project is used to finance fencing and well digging. The other two installation visited which were created by member initiative have benefitted from subsidies and medium term credits form Fonds de Development Rural funds to buy fencing and pumps only. Their membership receives no short term credits for inputs. Potato seed, by far the most expensive input, is purchased for cash.

8. Extension Services - All of the installations benefit from extension services. This is as true for the two non-project installations as for the four project installations visited. Within the projects the extension agents are project employees. The Africare project has both male and female extension agents. At the non-project sites the agents are O.R.D. employees.

B. Technological and Economic Aspects

1. Overview

The introduction of gardens (for home-consumption) and market, has altered the production patterns of a significant number of rural families in Upper Volta. Following the cereal harvest, a number of areas are now being irrigated and planted with vegetables. This activity occurs primarily during the four dry months December - March and is discontinued at the onset of spring rains. Some vegetable are preserved by traditional methods (e.g., drying), but they become scarce during the remainder of the year, unless industrially processed or imported. As the fresh product has found acceptance in urban centers there has been a considerable expansion of areas under cultivation. Precise data on this phenomenon are not available but we do have some information from UVOCAM[1] on areas cultivated by members of cooperatives affiliated with that organization who market through it. This would set a lower limit on hectares devoted to market gardening. A 1977 study by SAED[2] estimated that UVOCAM handled 15% of Upper Volta's exports of vegetables and fruits.

There are of course areas, particularly within a short radius of Ouagadougou, Bobo Dioulasso and other large Voltan demand centers, where gardeners are not affiliated with UVOCAM. These are groups of individuals who pool resources for the purpose of pumping irrigation water from natural lakes, dammed water courses or shallow wells. The area cultivated by such groups is expanding rapidly.

Table II presents a breakdown of the member cooperatives of UVOCAM, the areas under cultivation under their auspices and their distance from Ouagadougou.

1/ Union Voltaique des Cooperatives Agricoles et Maraicheres.

2/ SAED is a privately owned Voltan applied research institute.

TABLE II

Membership in UVOCAM and areas under cultivation

ORD	Sector	No. of Producer Groups	Surface Planted to Fruits and Vegetables (ha)	Regional Cooperative	Distance Ouag. (kms)
Centre-Nord	Kougoussi	3	200	SOCOBAM	120
Centre-Nord	Kaya	2	20	SCOBAM	120
Centre-Ouest	Koudougou	3	20	URCOMAKO	120
Volta-Noire	Dedougou	3	160	DEDOUGOU LANIFERA	340
Yatenga	Ouahigouya	6	30	URCOMAYA	180
Hauts-Bassins	Bobo-Dioulasso	11	40	URCABO	360
Centre	Ouagadougou	12	40	URCAMO	--
	TOTAL	40	510		

2. Volume of Horticultural Production

Estimates of production which are developed from rough measures of areas under cultivation, and multiplying these by assumed yields, are unsatisfactory for a variety of reasons.

First, areas under cultivation and cropping patterns fluctuate with availability, depth and quality of ground and surface water for irrigation, cost of inputs and market prices.

Second, yields may change, especially with regard to crops newly introduced into an area. Fertilizer and pesticide treatments have to be worked out and followed; natural soil fertility may become exhausted; rainfall conditions are irregular; pest and disease outbreaks are not regularly monitored; and introduction of new cultivars of the same crop significantly affect yields.

Third, The cultural practices observed in the field make it unwise to place much stock in production data derived from areas and yields. The growing season is long enough to replace a harvested crop of short maturity (radish, lettuce) with another one (e.g., tomatoes). There is a certain amount of intercropping, as well as inclusion of inedibles such as gourds and tobacco within irrigated perimeters. Worst of all, the typical area is split into tiny extensions, sometimes only three or four rows across by two meters in length, of a given crop. In very few cases did the team observe as many as a thousand plants of any one species within a given cultivation site.

A serious statistician would not attempt to correct for all of these obstacles to measurement. As an alternative, we note that total sales through UVOCAM have stabilized at just short of 1700 metric tons over the past three years. Of these,300-350 tons have been fruit (largely

mangoes), 300-360 tons have been potatoes (plus 40 tons purchased from non-members of cooperatives, but there is a reason for keeping these apart) and 50 tons have been miscellaneous vegetables. By difference, we obtained 950-1150 tons of green beans for both domestic sale and export.

To try to extrapolate these numbers to total production, we note that large amounts of mature onions, much larger than could be accounted for by the 50 tons of miscellaneous vegetables sold through UVOCAM, are sold in Ouagadougou through private channels. But monthly potato consumption during five months of the year in Ouagadougou, from January through May inclusive, is about 150 tons, thereafter dropping to about 70. Thus total potato consumption in Ouagadougou is 1240 tons. Subtracting 400 Ton UVOCAM sales yields 840 tons private sales, of which 490, the 70 ton consumption for the seven low consumption months, are imported. It is assumed that other population centers on the Mossi Plateau enjoy comparable patterns of demand, the outcome yields Table III. Table III estimates market demand for potatoes in the largest demand centers of the Mossi Plateau. The population statistics come from the official 1975 census.

Total production for sales fresh produce of all other vegetable crops, including onions but excluding green beans,is not nearly this high. In conclusion, total production on the Mossi Plateau can be estimated as:

Green Beans 1000 T. (of which substantial share is exported)
Potatoes 3827T

All other vegetables 1600 T. assuming one-quarter of vegetable production by weight is in this category. Total production of vegetables on the Mossi Plateau can be estimated at 6400 Tons per year.

3. Production Techniques and Production Costs

Production techniques are alluded to above. Plot size is very small, much less than one hectare of any one crop except in a few gardens. Potatoes are the most extensive

crop and (because of the cost of the seed) the most expensive to grow. They are generally not fertilized, except with animal manure. (U.S. practice would be to apply up to 75 lb. N, up to 132 lb. P and up to 200 lb. K per acre, the manure would supply some N and K but none of the P required, and yield would rapidly decline without an adequate supply of all these macro nutrients). Small whole seed potatoes (pre-sorted by the seed grower) are dipped in fungicide and planted very closely. No pesticide or fungicides are applied between planting and harvest. Nevertheless, no serious leaf damage due to disease or insects prior to harvest was observed. In the Yatenga O.R.D., at least, there have been no serious losses reported from soil-borne potato diseases or soil insects (although disease and pest reporting is erratic at best). The Claudia variety is reported to be susceptible to scab but we did not see this cultivar. No hired labor was reported[1] -- only that of the cultivators, who otherwise would have been idle. There were no land costs, since land is double-cropped to cereals at the onset of the rainy season.

1/ The subject of hired labor is worthy of further investigation.

Thus production costs are confined to seed, fungicide and sacks. Seed costs can be estimated as follows:

20 bu/a x 60 lb/bu x 2.4 a/ha x 1/2.2 kg/lb. x 1/50 sack/kg x 17,590 FCFA/Sack x 1/16 ha/ton = 27,784 FCFA/ton [1]

1/ The subject of hired labor is worthy of further investigation.

2/ This expression converts the estimate of seed use (in bushels per acre). To seed cost per ton of marketable potatoes assuming a yield of 16 tons per hectare.

Fungicides are quite inexpensive, (agricide, H.C.H., is widely used) and can be stretched very far, especially on uncut potatoes. A reasonable cost estimate would be 5,000 FCFA/ton of potatoes.

250 FCFA/Sack x 1/30 Sacks/Kg x 1000 Kg/ton = 8,333 FCFA

Thus total production costs per ton are of the order 40,000 FCFA for the type of culture practiced. We are assuming that water and land can be obtained for labor, that labor is free, and that chemical fertilizers and pesticides are not used.

One might speculate that costs will rise in the future. The assumed yield of 16 tons per ha. (reported by the ORD for Yatenga Section 1981) cannot be maintained without chemical fertilizer. This is respectable, compared to the U.S. average of about 28 tons/ha., but its maintenance is also conditional upon good luck with insects (air and soilborne) and fungi (on foliage and tubers) as well as with weather. On this last point, this has been a dry year in Yatenga. A grab-sample of harvest-ready plants exhibited extremely small tubers, which extrapolate to nowhere near the assumed yield of sixteen tons -- four to eight, perhaps. This would barely quadruple seed use but still would yield a profit if sold. Whether this shortfall from the average in the previous year was due to phosphorous deficiency or inadequate irrigation during the critical water-stress period of tuber formation we have no way of

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1/ This expression converts our estimate of seed use (in bushels per acre) to seed cost per ton of marketable potatoes assuming a yield of 16 tons per hectare.

knowing.

A limited amount of urea is used on cabbage but apparently on no other crops. Otherwise, the procedure for potatoes is followed on the other crops. The most common vegetables observed in Yatenga were potatoes, onions, maize, carrots, cabbage, green beans, lettuce, cauliflower, tomatoes, bell peppers, egg plant, ochra and some squashes. There was also a considerable amount of tobacco grown.However, a very limited number of cultivars are available for each crop.

Allowing for the fact that few of the growers in Yatenga had any experience growing potatoes ten years ago, or any of the other vegetable grown, they have been doing a creditable job at this point. The individual plots are well weeded (no herbicides used) and plants are well spaced. Within the plot,considerable planning is evident,in terms of replacing maturing crops with ones which will ensure a steady supply until the end of the growing season. The one disturbing fact is the apparent drop-off in potato yield in 1983, as well as the slowness in reducing areas planted to potatoes in the face of problems in marketing the potato crop (the latter discussed below).

A 4-hectare plot cultivated since 1979 near Kombissiri (40 km. from Ouagadougou) is devoted almost exclusively to potatoes, double-cropped with corn. Some N-P-K is used,and water is adequate through the year. Yields are probably over 20 tons. Harvesting is primitive (hand-hoe) and damaging. A major complaint is the unstorability of the cultivars used, seed for which is imported by UVOCAM and distributed through the ORD. On the other hand, the group has no access to long term cold storage (as an unaffiliated group it is ineligible to use UVOCAM's facility). One member of the group knows of a person who has resorted to this facility and was dissatisfied both as to the cost and

storage losses. Instead, the group trucks the produce to Ouagadougou and takes its chances on the spot market price which can often be 10-15 FCFA/kilo below the 125 FCFA which has held since the 1980/81 season. The group reports some ability to stagger the harvest by delaying part of the planting although this is not a sure protection from market price fluctuations. In as much as UVOCAM's buying form member coops is not widely publicized it is hard for these growers to time their sales.

4. Elements of the Marketing System

a) The Union (UVOCAM)

The role of cooperatives in marketing horticultural products in Upper Volta is a long standing situation. UVOCAM was created in 1968 by agreement among the regional cooperatives (listed on Table III). Its importance in the marketing system is represented in the estimate of the share of total horticultural production it handles. According to its organic statute, it is responsible for:

-- Effecting, directly or indirectly on behalf of its members, all operations of production (sic?), storage and marketing of products originating from their activities.

-- Providing, directly or indirectly on behalf of its members, materials and inputs necessary for their activities.

-- Developing organizations for research, experimentation and analysis in the interest of improving products, enhancing their appearance, shelf life or sales.

In fact UVOCAM operates within a much more narrow mandate. UVOCAM concentrates on promoting production on collection and an exportation of green beans. It is active to a lesser extent in potato production input supply, potato collection, storage and domestic marketing. It has little interest in any other commodity.

In promoting its cold storage and marketing functions UVOCAM has installed about 20,000 tons of cold storage space and a small cannery in Ouagadougou. Neither of these is optimally used. Green beans (in season) occupy up to 1/10 of available cold storage space and domestically produced potatoes, scarcely 2%. Cold storage is available to member coops for a reasonable 10 CFAF/ton/day. But it is unavailable to unaffiliated groups or private firms. URCOOMAYA, however, could have saved its potato crop in 1981 by

TABLE III

Estimated demand for potatoes in selected centers on the Mossi Plateau

Center	1975 population	Demand in Tons	From National Production in Tons
Ouagadougou	172,661	1240	750
Koudougou	36,838	265	160
Ouahigouya	25,690	184	111
Kaya	19,293	139	84
Tenkodogo	18,224	131	79
Dedougou	7,913	57	34
Total	280,619	2016	1218

If it is assumed that other population centers on the Mossi Plateau enjoy comparable patterns of demand, the outcome Yields Table III. Table III estimates market demand for potatoes in the largest demand centers of the Mossi Plateau. The population statistics come from the official 1975 census.

In an evaluation, dated fall 1982, of its involvement with URCOMAYA in Ouahigouya, Oxfam es mates that the Yatenga produced approximately 525 tons of potatoes in the 1981-82 season. Subtracting 51.5 tons of potatoes bought by the regional cooperative and 111 tons of local production estimated as consumed within the city of Ouahigouya, the rural consumption in Yatenga was approximately 360 tons last year.

shipping it to Ouagadougou for storage by UVOCAM. Apparently, it did not have the cash to hire the trucks. UVOCAM's cold storage installation is not used on any crop other than green beans and potatoes. UVOCAM's potato purchases may contribute to the relative price stability reported during the peak of the harvest season although UVOCAM is not always in a position to profit from the seasonal potato glut. The 1982-83 season is one example. The timing of purchases depends on availability of inputs (sacks, which caused a problem in 1981) and UVOCAM's overall cash-flow and credit situation. But, the availability of these stocks has doubtless extended the season. After about March 15 UVOCAM dominates the marketing of domestically produced spuds. This situation extends through June.[1]

The cold storage installation was overdimensioned on the basis of optimistic projection of green bean exports. The shortfall seems to result from both supply and competition from other producers for the same market. In trying to undercut bids from these producers, UVOCAM lost FCFA 47 million in 1981/82. It recouped this shortfall from member coops at the end of the year. The Union netted 500 million FCFA in that year. This is not necessarily a result of poor management since with heavy fixed costs for the cold storage facility it would make sense to price aggressively.

Viewed as an asset for evening out the flow of produce to the country's major market, there is something to be said for UVOCAM. Purchase by UVOCAM of 400 tons of potatoes each year for storage and off-season sale may stabilize prices and extend the marketing season for this crop. Reduction of this program without imposition of a substitute of equal or greater magnitude would be catastrophic. Moreover, it makes sense to store in close proximity to consuming, rather than producing centers. Service is more likely to be available in the capital and skilled technicians would probably prefer to live there. One wonders whether the facility shouldn't

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1/ A seasonal tarriff is then reportedly removed, admitting European potatoes.

be used for citrus (which stores for up to six months if proper sanitary precautions are observed) or perhaps for cut flowers, nursery stock, dairy products, and stocks of potatoes belonging to private traders or unaffiliated groups.

The cannery operates very sporadically in January and February (at 3-4 day intervals) for thermal processing of green beans. Through the balance of the year it provides off-and-on employment for 20 people in the production of strawberry, mango and guava preserves. Overall, it works 2 1/2 months per year. UVOCAM is circulating a project for broadening its line of preserved foods to tomato puree. Since it fears supply interruptions from its producers, it proposes to integrate backward into a wholly-owned tomato production through processing operation. One can obtain an up-do-date estimate of tomato production costs on an industrial scale in Upper Volta from the UVOCAM proposal. Few tomatoes are so produced on the Mossi Plateau, however. It seems odd that the participating regional cooperatives are not being recruited for this potential market. Circulation of the proposal testifies against the inclination or ability of UVOCAM to perform marketing functions on behalf of its members in certain crops, at least.

The facilities in UVOCAM's cold storage and canning establishments are hardly state-of-the-art technology. Materials handling is manual rather than palletized lift-fork trucks. There is no automatic humidity control in the cold storage; this would have to be accomplished by reading a wet-bulb thermometer and splashing water on the floor to maintain humidity. There are no recording thermometers.

The filler feed in the canning line jammed on the day of the plant visit and there is no evidence of closure control or quality control inspection. (FDA requires that this be done in all U.S. canneries subject to instant recall of all production and ceasing of operations if violated).

It is certainly technically feasible to take the necessary steps to operate the cannery continuously for a long enough period to make prices competitive with European canned goods in Upper Volta, if not in Ivory Coast. UVOCAM would simply have to schedule a steady supply of beans or

other vegetables suitable for thermal processing. Altering the process schedules for different vegetables is not difficult with the still retorts used. The cannery might also do something with pickles. It currently has a warehouseful of vinegar for this purpose but can't induce producers to grow pickling cucumbers. This is another indicator of UVOCAM's inability to open new markets for its suppliers.

b) Cooperatives, producer group and regional cooperatives. The number of cooperatives de base now numbering 40, has remained stable in recent years whereas the number of unaffiliated producer groups appears to be rising, as well as their resistance to affiliating with the regional cooperatives. In point of fact, there seems to be very little reason to affiliate unless they produce green beans for sale in the export market.

In Yatenga, URCOMAYA owns some cold storage (40 tons) independently of UVOCAM. This cold storage is one product of Oxfam intervention in support of the regional cooperative since 1976. This is the only storage owned by a regional cooperative. In 1981-82, the regional cooperative sold about 8 tons of potatoes outside UVOCAM, but only when faced with the loss of the entire marketable crop (in excess of 100 tons) exclusive of its storage capacity. All but about 50 tons of this crop did in fact spoil. URCOMAYA has been able to sell little produce other than through UVOCAM. It might be added that this regional cooperative wields real clout in the region; its members account for 1/3 of the potatoes, all of the beans, half of the cabbage, all of the onion and tomato, half of the lettuce, all of the carrots, half of the eggplant, okra and leafy vegetables produced in Yatenga department. We can safely say that they perform all of the interdepartmental sales of produce. URCOMAYA's cold storage facilities are smaller but about as crude as those of UVOCAM. Neither has shelves (necessary for preventing damage to the goods on the bottom of the stock). Neither has humidity control. But all of this is rather incidental because URCOMAYA at present has no one to operate it. Their first technician, trained in Europe in both vegetable marketing and cold storage technique, was hired away by Africare and his replacement was subsequently hired by "Six-S".[1] Dutch Foreign Aid is reportedly sending a cold

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1/ "Se Servir de la Saison Seche en Savane et au Sahel", a Ouahigouya based PVO.

Table IV projects rural consumption of potatoes on the Mossi Plateau from the estimate established fr the Nord Department (Yatenga).

TABLE IV

Projection of Rural Demand for Potatoes on the Mossi Plateau

Department	Total 1975 Population	1975 Rural Population	Consumption of Potatoes in Tons
Nord	530,192	504,502	360
Volta Noire	635,760	627,847	448
Centre-Ouest	788,962	752,124	537
Centre-Nord	632,285	612,992	437
Centre-Est	404,602	386,378	276
Centre	944,706	772,045	551
Total	3,936,507	3,655,888	2609

It is assumed that virtually all potato consumption in the rural areas of the Mossi Plateau comes from local production. Virtually none is imported. In that case potato production on the Mossi Plateau in 1981-82 can be estimated at 1218 tons plus 2609 tons or 3827 tons.

storage technician. However, he has not appeared and the potato harvest has already begun.

URCOMAYA's financial situation is reported in C. Wardle's analysis in the fall 1982 Oxfam evaluation of its involvement with URCOMAYA. Oxfam's phasing out of its support has led to URCOMAYA's loss of its staff. URCOMAYA's inability to obtain potato sacks from UVOCAM in 1981/82, led to a disastrous marketing campaign. it has not been able to supply green beans in 1982/83. It has been unwilling or unable to store potatoes in UVOCAM's facility at Ouagadougou. It has been unsuccessful in seeking out private markets in either of those years. UVOCAM is temporizing on planned purchases of potatoes in 1982/83. In short, a whole glossary of institutional shortfalls, deficiencies, lack of linkages, lack of contingency planning and leadership, lead one to ask whether there is enough of URCOMAYA left to salvage. Oxfam is withdrawing its support asking the same question.

The team found persons in the MDR who were well aware of URCOMAYA's decline. They stated that this was not atypical among the regional cooperatives, and that restructuring could only come from below; that is by a sort of triage among affiliated producer groups in which both the weak ones and the star performers might both go their own way. This pruning could leave UVOCAM with only green beans as a market product.

UVOCAM still acquires vegetable seed for the regional cooperatives. The team heard numerous complaints concerning its conservative attitude regarding requests from growers for cultivars other than the narrow menu provided. This situation is likely to become critical over the next few years unless the selection of cultivars is coordinated with knowledge of pest and disease outbreaks and resistant cultivars. Also the work on field trials (below) will be totally counterproductive unless UVOCAM makes it possible for growers to obtain the successful cultivars.

c) Unaffiliated Producer Groups

The team had more contact with these groups in the wholesale market at Ouagadougou, than in the field. Evidently, they are numerous in the environs of the city and provide a broad range of high quality produce to the urban markets. Much of it is brought in by motorcycle or motor

TABLE V

Cost of transport per ton per kilometer in (FCFA)

Vehicle Type	Paved Road	Ordinary Laterite	Ordinary Track
Bush Taxi (1 ton)	44.78	57.58	75.97
Minibus (3 ton)	18.14	23.83	33.00
7 ton Truck	11.91	17.19	24.80
10 ton Truck	9.99	13.31	20.32
40 ton Trailer	3.86	5.52	7.80

scooter, in small lots, by growers who either sell to known concessionnaires in the market or who set up in the street outside the market to earn the spread to wholesale produce to venders from inside the market. These "irregulars' risk being cleared away by the police. Their primary activity is not retailing although they are not adverse to earning the spread between wholesale and retail prices if the opportunity presents itself.

Larger transactions take place in a lot back of the market, facing a retail installation which bears the UVOCAM sign and sells only potatoes. URCOMAYA has trucked produce to sell at this site from Ouahigouya. This has not been a successful venture due principally to the high cost of transportation, the high rates of spoilage for the produce and the lack of cooperation of not active resistance of UVOCAM.

Unaffiliated producers groups truck potatoes, onions and cabbage to Ouagadougou in 1/2 ton to 1 ton loads. They strike deals with concessionnaires who haul the produce off (100 - 500 kg. at a time) and pay for it following resale. Evidently the producer hasn't the bargaining power to obtain cash up front. This can work a serious hardship on someone from far away, say, from Yatenga. Most of the haulage is in vehicles owned by a member of group, often ;himself a civil servant. In the instances of contract haulage, the owner tends to come along. The wholesale gathering function, so highly developed by truck drivers in Latin America, for example, apparently does not exist in Upper Volta. One could explain this by the scattered nature of production. A truck driver would simply starve to death roving the countryside for any one kind of vegetable in sufficient quantity to wholesale. Instead, the unaffiliated producer groups and regional cooperatives in a few instances are performing the bulking function in addition to that of production. They are also financing the retailer's inventory. Such burdens on the producer are clearly obstacles to the expansion of market trade in fresh produce. Yet the unaffiliated producers' groups show no interest in allowing cooperatives to assume these functions. Given high demand, high production possibilities and relatively low losses in transit for potatoes, onions and cabbage, private independent wholesalers may begin to emerge in the

Ouagadougou market for these crops. As for other crops, they will probably continue to be handled in the present manner for some time to come.

IV. Definition of the Marketing Problem

A) Cost of Transport

The cost of transport is an important factor in computing the price of produce delivered in the market. Peak season prices may dip to the point where produce beyond a certain distance can not enter the market profitable whereas it can at higher prices generally prevailing at the beginning and end of the growing season.
The team attempted to calculate the real cost of transport per 100 kilogram sack of produce between particular vegetable production areas and particular markets in Upper Volta. The calculations were based on a 1980 BCEOM Road Maintenance Study. Table V presents the cost per ton kilometer of transport over different types of road in Upper Volta under average road surface conditions for different types of vehicles.

Table VI derives the cost of transport per 100 kilogram sack of produce between a number of well-traveled points. The figures on this table are significantly less than prices charged by private transporters. They assume vehicles used year round and they do not take account of spoilage and losses in transit.

The team is not very confident of the figures in Table VI since they are so much less than current private transport rates. That notwithstanding the most striking demonstration in Table VI is of the precipitous drop in cost of transport per unit weight from using a one ton vehicle to using a three ton vehicle. On way to reduce the cost of transport per unit weight, therefore, would be to use three ton transport vehicles at a minimum.

B) Lack of Access Water.

Lack of access to water is a marketing constraint only insofar as production is insufficient to meet demand. This has yet to be established.

TABLE VI

Cost of transport per 100 kilogram sack of produce between major destinations in Upper Volta (in FCFA).

From	To	Km	Nature of Road	Charge for transport per vehicle type				
				Bush taxi	Mini-bus	7 ton truck	10 ton truck	40 ton truck
Ouagadougou	Ouahigouya	182	Laterite	1048	434	313	242	400
	Kongoussi	112	Laterite	645	267	193	149	61
	Koupela	137	Paved	613	249	163	137	53
	Kaya	98	Laterite	564	234	168	130	54
	Kombissiri	38	Paved	170	69	45	45	15
	Seguenega [1]	234		1347	558	402	311	129
	Bobo Dioulasso	359	Paved	1608	651	428	359	139
	Garango	147	61Km Paved	768	316	220	175	71
	Beguedo	131	61Km Paved	676	277	193	154	62
Ouahigouya	Somadougou, Mali	222	Laterite	1278	529	382	395	123
	Dedougou	182	Laterite	1048	434	313	243	100
	Bobo Dioulasso	358	Laterite	2061	853	615	476	198

1/ The 110 kilometer stretch between Ouagadougou and Yako will be paved by next year. Work has begun. This will reduce the real cost of transporting a 100 kilogram sack of produce across the board by 15 to 18% from Ouahigouya and Ouagadougou and by 11 to 13% from Seguenega to Ouagadougou.

At each of the six vegetable gardening sites visited lack of sufficient water resources was cited as a problem. In two cases lack of water meant areas left uncultivated. In one case, according to group members, it meant favoring potato cultivation at the expense of vegetables.

C) Limited Access to Credit.

Relatively small amounts of credit are deployed at any point in the production, storage and marketing of vegetables. What institutional credit there is comes mainly as production credits through projects promoting vegetable cultivation. In effect much of the marketing system operates on credit. It is the producer, however, the most economically vulnerable link in the chain who currently finances the system. He is often compelled to surrender his goods on a credit basis. He extends this credit for under a week in the private marketing system and up to four months if he is in a position where the parastatal system is able to requisition all or part of his production.

Wholesalers and retailers have no access to credit for buying, storing and selling other than that provided by the producer as described above.

D) Lack of Access to Storage for Perishables

At each of the six sites visited cultivators stressed the point that there is no marketing problem for anything other than potatoes. Potatoes are produced in large quantities. Peak season prices fall to disappointing levels. Cultivators and consumers would, in principle, benefit from storage of a share of peak season production for post season consumption.

At present the cold storage owned and operated by UVOCAM is vastly under-utilized. Its facilities are not, under present regulations, accessible to private entrepreneurs, whether growers, wholesalers retailers or groups not members of the UVOCAM federation.

E) Lack of Adequate Secondary Roads

Lack of adequate secondary roads was not a problem at any of the sites visited. However, if further study determines a large unsatisfied demand for vegetables, intervention is promotion of production will be appropriate. In that case it is quite possible that water resources and

labor will be very promising at sites whose main draw back could be lack of adequate roads.

F) Inappropriateness of Cultivars

Inappropriateness of cultivars may be an important marketing problem. Given that the vegetable marketing problem encountered by the team was a potato marketing problem and given that one solution to periodic potato gluts would be storage of a portion of potato stocks, one quality that must be sought in potato cultivars is storability. The longer they store under conditions prevailing at their storage site the better, provided storage qualities are not gained at the expense of productivity in land and labor, requirements for inputs, susceptibility to disease or insect infestation and cooking qualities.

G) Availability of Labor

Labor availability seems to be a problem in production and marketing of vegetables only under very special circumstances. In Mogom, for example, a large area of the installation is uncultivated. The reason is that the rainy season harvest was so poor this past year that potential vegetables cultivators, members of the group with their assigned plots, decided to go elsewhere during the dry season to find wage labor. Similarly, in Ramsa there was a small area that is uncultivated due to illness of the person to whom it is assigned.

H) Organization and Institutional Problems

Organizational and institutional problems present far and away the biggest obstacles to successful vegetable marketing.

Organization in local production and marketing groups presents certain advantages to members. These advantages are in terms of collective work for activities of common interest such as fencing and well-digging, of access to credit using a promise of corporate solidarity for security and of bulking produce before shipping to market thereby, presumably, saving on transport costs per unit and,

negotiating price from a concomitantly strong position. Local level groups are not, however, as strong and capable as they might be. Specifically, they do not have confidence in themselves as actors in the market.

A more important problem arises for those four sites, for example, visited in the Ouahigouya area which are required to market their potatoes through the regional cooperative which in turn is required to market potatoes through the national cooperative federation of which it is a member. The problems with this system are, first of all, that the cooperative hierarchy does not give timely information to the farmer on how much of his production it will be buying. This makes it very difficult for him to plan his marketing strategy and it makes it very difficult for him to build the commercial/personal relations with private traders that he needs to be able to market production in excess of what the cooperative hierarchy takes. A second problem is that the cooperative hierarchy dictates the price at which it will take the production. The price is not fixed, in fact, until the buying campaign is over and the national cooperative federation has had a chance to look at its books. While it generally makes a profit, produce prices paid to producers at the end of the buying campaign are often substantially below what producers are led to expect at the beginning. A final problem is that the short term credit financing the whole structure comes from the producer, the most precariously placed element. The producer generally has to wait three to four months before he is paid.

I) Summary Definition of Marketing Problem

The principle marketing problem for dry season vegetable cultivation is a potato marketing problem. Local markets are able to absorb other vegetables produced with no significant waste or losses. Part of the problem is a distance problem. Many major production centers are too far from the biggest markets to enter those markets profitably at peak season prices. Looked at from this point of view, therefore, the problem of marketing potatoes may translate itself into a storage problem. If medium term storage is, in fact, a way of solving the potato marketing problem in whole or in part a subsidiary problem will arise of

identifying a potato cultivar appropriate to the storage solution. All of this, however, still leaves open a nagging problem of what institutions and institutional linkages are most promising in channeling potatoes from the field to the dinner plate.

V. Recommendations

A) Studies

1)Demand studies for vegetables - One possible solution to the potato marketing problem would be to promote increased green vegetables production at the expense of potato production. Most vegetables do not travel as well as potatoes, however, consequently a study of the local absorptive capacity for green vegetables would be a prerequisite in any area where promotion of green vegetable production is foreseen.

At the same time any larger scale intervention in vegetable production must be preceded by a potato demand study focusing on the national market. Is the national market large enough to absorb increasing quantities of potatoes at prices advantageous to producers assuming marketing problems solved?

2) Storage study - A small study should be undertaken to see if potato prices rise enough in the post-harvest season to make storage up to four months advantageous directly or indirectly to the producer.

B) Production Side Recommendations

The recommendations are made on the assumption that studies will show local demand for green vegetables and national demand for potatoes are unsatisfied. In that case this study recommends that USAID/UV intervene in vegetable production in the following sectors:

1) Water - Increases in production are dependent on increases on availability of water. USAID/UV should move to improve water sources for existing installations and create new sources for new installations. Building impoundments in water courses will have more social benefits that digging wells.

2) Credit - To some degree production could be expanded if more credit were available. Independent production groups such as those visited in Kombissiri and Koupela generally have to pay cash for seed and other inputs under present conditions.

3) Road access - To the degree that USAID/UV may find certain sites particularly susceptible to vegetable production development it may become necessary to construct secondary access roads to the sites to carry supplies in and production to market. Road construction was not necessary at any of the six sites visited, however.

C) Marketing Side Interventions

Irrespective of the results of the demand studies USAID/UV should initiate the following steps to improve the abilities of producers to market potatoes under advantageous conditions:

1) Credit

a) For producer/wholesaler operations - USAID/UV should explore sources of credit that would enable producers to get paid on delivery. One option would be institution of negotiable notes executed between potato wholesalers and producers. The notes could be discounted at a cooperating bank and producers would receive cash on the day of delivery. For the bank to accept this, however, it would need guarantees of the integrity and bankability of the wholesalers' operations. Moreover, this system may have a negative impact on cash revenues received by producers for potato sales. Finally, it is unclear what interest wholesalers would have in this system. It would be burdensome for them to qualify and they already get cheap credit from the producers.

b) storage operations - USAID/UV should explore the possibilities of setting up a secured loan program to facilitate potato storage. Of course, it is important to see the results of the proposed economic feasibility study for storage before proceeding with this recommendation. The principle of the secured loan program would be to advance money to a person or group which places potatoes in storage. On repayment of the advance plus charges the potatoes could be drawn out of storage. If repayment is not made by a

with the recent Oxfam evaluation of its experience with the regional vegetable marketing cooperative. In principle, moreover, produce is best stored close to its market destination rather than close to its source.

c) Local storage - In violation of the principle just cited it is recommended that USAID/UV investigate low cost means of storing potatoes on farm. Producers feel they would be in a stronger bargaining position with wholesalers if wholesalers had to come looking for produce as opposed to the present system where producers bring produce to market hoping for the best, but knowing they virtually have to sell, transport costs being what they are. On-farm storage would, however, have to be adopted on a large scale to change potato marketing practices.

2) Suitable Cultivars

There is no necessary reason why UVOCAM should have the responsibility of acquiring potato seed for potato producers. It is necessary to determine the most adaptive potato cultivars through field trials. A number of institutions are currently working in this area. IRAT, at Farako-Ba near Bobo-Dioulasso reports on field trials on a range of market vegetables. Also, the Service de Vulgarisation et de la Recherche Adoptee has facilities and some trained staff with staff-trial experience. UVOCAM reports that it seeks out promising cultivars, especially of potatoes, and grows them out in attempting to guide its purchases of seed for distribution through regional cooperatives and the O.R.D.s. These various efforts must be drawn together into a national system which would effectively orient such activities as acquisition of seed both domestically and abroad and plant breeding, which the National Seed Service expects to extend to vegetable cultivars.

3) Marketing institutions

It is recommended the USAID/UV support the creation of the sorts of marketing ties that obtain between the cultivation groups visited in Kombissiri and Koupela and potato wholesalers. Larger scale organizations of the order of URCOMAYA and UVOCAM do not give the producer any evident advantage in the market place especially if he can arrange for use of their cold storage facilities as a private party or in concert with a small group. The focus of this effort

certain time the creditor would take possession of the produce to sell on the markets.

4) Access to storage

a) UVOCAM - UVOCAM cold storage facilities are grossly underutilized. It appears that one reason for this is that private parties and independent cooperatives are not allowed to store produce there. The reason for this is probably that, if private parties and independent cooperatives had free access to UVOCAM cold storage, UVOCAM would lose a lot of the leverage it has to keeping its membership. If that happened it would lose its sources of supplies of produce under conditions that enable it to make profits. This analysis notwithstanding it is recommended here that USAID/UV exert what pressure it can to find a formula to open up the facility to the general public on a space available basis as a profit making subsidiary of UVOCAM. If nothing else this will allow the hypothesis to be tested that the availability of cost storage is the major factor limiting storage of potatoes from one season to another.

UVOCAM does not seem a promising candidate for AID assistance for a number of reasons. Firstly, it is a government controlled corporation. The members of the Board of Directors are ex officio figures in government offices and ministries. However, current policy is to place AID resources almost exclusively into promotion of the private sector. Secondly, UVOCAM's main effort has been devoted to intervention in the export market for green beans. Only to a much lesser extent has UVOCAM been interested in potato marketing. UVOCAM has not handled potato marketing well from a number of points of view. The question must even be answered, judging from its performance record, of how seriously interested UVOCAM is in domestic potato marketing operations, to begin with. Finally, UVOCAM fills no particular function from the small producer's point of view that can not be and is not being filled by unaffiliated groups.

b) URCOMAYA - URCOMAYA administration is in such disarray and its technical ability to use its cold storage is so problematical that no recommendation regarding use of this facility is made at the present time. This recommendation to keep URCOMAYA at arms length is consistent

should be on generating small groups capable of meeting their marketing requirements. Private sector wholesalers are in place. Administrative adjustments such as that mentioned above regarding UVOCAM cold storage regulations should be sufficient to make private marketing arrangements profitable for all parties.

URCOMAYA has made several attempts to market members produce with UNOCAM intervention. URCOMAYA has made six produce deliveries in home. This has not worked out to be a successful undertaking for several reasons. Most importantly buyers have not honored contractual arrangements. At the same time, perishability to produce has meant larger losses than anticipated. Finally competition in coastal parts with European imports has been great.

These missions to home have not generally been successful. A promising area of donor intervention would be underwriting marketing experimentation for, in the beginning, unaffiliated groups in the Bobo Dioulassa and possibly several of the Malian markets from the Yatenga area. Areas farther south on the Mossi Plateau might more profitably investigate marketing opportunities in Togo and Benin.

5) Sites

Priority should be given to finding sites for new vegetable installations that are relatively close to unsaturated markets. This is a higher priority for green vegetables than for potatoes. Green vegetables neither travel nor keep well. All the green vegetables growers interviewed by the team in the Ouagadougou market came from under 20 km from the market. Potatoes and onions alone came from farther away. Yet even in those cases transport costs place a limit on the distance from production point to market. An argument can be made that the source of the potato marketing problem in the Seguenega area is its distance from Ouagadougou.

D) The USAID/UV Project context for Above Recommendations

1) Water recommendation

This intervention is presented in the ADS PID as one activity of the selected services component of the project.

2) Local storage

Intervention in this area seems perfectly within the objectives of the forthcoming HATT project.

3) Suitable cultivars field trials - Intervention in this area is presented in the ADS PID as one activity in support of the DSA in the research and technology transfer component of the project.

4) Marketing institutions

The support to the DIRC projected in the ADS PID under the technical and managerial skills training component can be aimed at, among other objectives, generating a marketing capability in local level groups.

5) Potato production

This report is not making any specific recommendations regarding promotion of potato production pending a demand study. The team suspects a rapid almost overwhelming rise in interest in potato production in Upper Volta in the next few years. The reason for this is that the potato is a food staple whose entire cultivation cycle takes place in the dry season. It does not compete with grains for labor or land. Because its entire cultivation cycle takes place in the dry season the opportunity cost of growing potatoes is low. The returns, however, are high. A family can nourish itself for weeks on the production of a few acres thereby prolonging the period it can cover with its grain reserves. In the meantime there appears to be a good market for potatoes. It is possible that the potato is on its way toward becoming a staple food on the Mossi plateau. As part of the food security component of ADS, USAID/UV might consider promotion of potato cultivation as such.

VI. Conclusions

Vegetable gardening in Upper Volta can hardly be described as a widespread phenomenon. Yet, in the last five to ten years, it has attracted larger and larger numbers of practitioners. For the most part these cultivtors have come to vegetable gardening spontaneously, not in the context of any particular project intervention.

Cultivators embark on vegetable gardening because it is a source of food and cash and conflicts minimally with other economic activities since it requires land and labor during the dry season only.

Cultivators are showing a greater interest in dry season potato cultivation than in cultivation of other vegetables. This is because potatoes can act as a dry season food staple for cultivator families at the same time as they provide a good source of market income.

Potato marketing does present some problems. The primary problem is an institutional problem. Since potatoes are harvested in larger quantities and are susceptible to longer distance travel than green vegetables, potato marketing requires institutional arrangements not required for green vegetables. For the latter the grower generally sells his produce on the market himself. For the former some sort of wholesaling system is required. Given the keeping qualities of potatoes, access to cold storage would also help the producer and the consumer.

A demand study of the potato market is a must. However, if this report's analysis of the role the potato is coming to play in the production strategies of Voltair cultivators is correct, demand for potatoes both for on-farm consumption and for the cash market will only grow.