INTERNATIONAL TRADE IN CASSAVA PRODUCTS

AN AFRICAN PERSPECTIVE

Prepared by the

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BACKGROUND

The international market for cassava began to develop in the 1950s, with the exportation of the by-products of the cassava flour milling industry from Thailand to the EC market. Half a century later, the EC continues to be the main destination and Thailand the main source of cassava trade. While new cassava markets have developed, especially in Asia, it has been difficult for most of the other major cassava producing countries to increase their share of the international market so Thailand continues to be the principal cassava supplier, with over 80 percent of the world market.

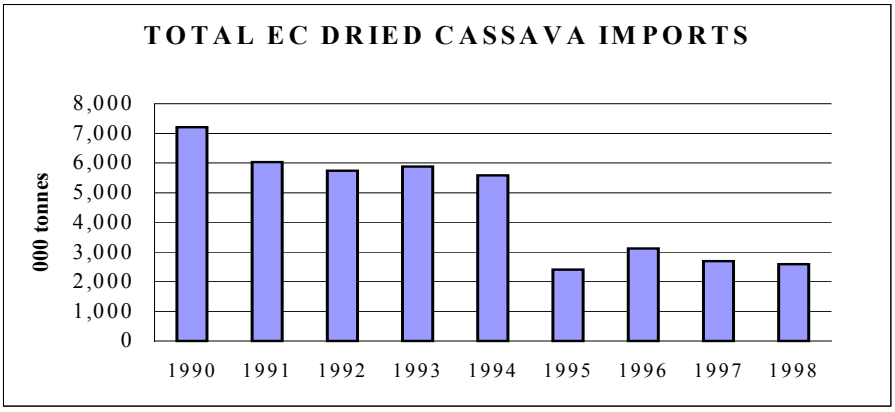
In the great majority of the producing countries, cassava has been consumed domestically or marketed locally, so the crop is often regarded as a "non-traded commodity". Thailand constitutes a major exception, since it consumes a mere four percent of what it produces. The development of the cassava sector in that country has been mostly export-led, and has capitalized on the country's comparative advantages, especially an excellent road and port infrastructure and little competition for cassava on the domestic market. The sector also benefited from public support to research. Recently, the Government has also intervened to sustain producer prices. Indonesia, China and Vietnam have been the other major cassava exporters but, unlike in Thailand, their trade has represented only a small share of production, since cassava is important for local food consumption in those countries.

Among the producers that have engaged in international cassava trading, most have targeted the EC cassava pellet market because of the low import duties applied and the relatively high prices they could get there. From 1982 to 1994, cassava was exported to the EC under a series of bilateral or multilateral trade agreements. Under these agreements, a maximum of 6.47 million tonnes of cassava chips and pellets was allowed to be imported every year subject to a maximum 6 percent ad valorem duty. Under the 1994 WTO Agreement, those agreements were replaced by country-

specific preferential tariff quotas[1] that basically maintained the access previously granted, including a duty-free quota of 145 590 tonnes for WTO members previously reserved to ACP countries.

Imports of cassava products by non-EC countries expanded in the mid 1980s, mainly as the result of an aggressive export policy by Thailand which gave exporters additional access to the remunerative EC quota whenever they manage to sell pellets to other destinations. As a result, even exporting countries such as Indonesia and China became significant importers of cassava products. In the Asian region, other markets developed, in particular the Republic of Korea, Japan, Malaysia, Singapore and the Chinese Province of Taiwan. By contrast, markets in Eastern Europe and in the former USSR Republics, which used to import sizeable volumes of cassava in the mid 1980s, virtually disappeared since the early 1990s following the dismantling of state trading agencies and the shrinking of their domestic livestock sectors.

The expansion in the global trade in cassava witnessed in the 1970s and 1980s was made possible by the maintenance of high domestic feed grain prices in the EC, under the Common Agricultural Policy (CAP). The EC CAP reform launched in 1992 entailed a strong reduction in EC feed grain intervention prices and effective market prices. This boosted the utilization of domestically produced cereals in feeds, which was accompanied with a contraction in EC imports of cassava pellets and falling cassava prices.



CASSAVA IN AFRICA

Although cassava is one of the main staple foods in Africa, it is only in the aftermath of the severe drought, which affected the region in the early 1980s, that it gained recognition from policy makers. The importance of the crop for food security and farmers' income generation in the region was confirmed by the findings of the Collaborative Study of Cassava in Africa (COSCA), a programme launched in 1989,

[1] Thailand was granted a preferential access of 5.5 million tonnes; Indonesia, 825 000 tonnes; China 350 000 tonnes; Vietnam, 30 000 tonnes (in addition to a 2 000 tonnes quota of cassava for human consumption).

which garnered evidence regarding the contribution of cassava to food security and to farmers' incomes. Most of the studies focusing on cassava in Africa conducted since then have continued to draw extensively from COSCA findings, even though some are based on ten years old information. In most countries surveyed, the economic and policy environment has also changed substantially.

In Africa, it is the growing domestic demand for food consumption which has sustained the expansion of cassava production, especially after the reduction of government support to cereal production and the liberalization of domestic and foreign trade in cereals in the mid-1980s and 1990s. Attempts have been made in several countries to promote cassava utilization as a commercial feedstuff, with limited success as low international prices for feed grains and overvalued domestic currencies have made cassava chips and pellets uncompetitive relative to imported feedstuffs. For instance, in Tanzania in the mid 1980s[2], cassava was utilized in the making of poultry and pig feeds by the Tanzania Feeds Company, a practice that was later discontinued as cassava prices were found high compared with grains. In Madagascar, cassava pellets are used by the industrial feed sector, but in relatively small quantities, not exceeding 10 000 tonnes per year[3]. By contrast, the by-products of cassava processing in Nigeria are gaining popularity among commercial livestock producers[4]. On-farm feeding of cassava to animals in the producing areas is not well documented. Studies have been conducted to assess the viability of cassava feed products in the region and, in most instances, they show that there might be some untapped potential to substitute cassava for grains in animal feed in the region. The analyses assume yields of the order of 13 to 14 tonnes per hectare, much above those prevailing on average in the region, which suggests that a rise in productivity at the farm level is needed for cassava to become a competitive feedstuff on domestic markets.

Although Africa is the major producing continent, it does not play an important role on the international cassava market except at the region level, but intra-regional flows are seldom included in customs statistics. Trade in fresh cassava roots and processed products, including gari and starch have traditionally been exchanged between African countries, while dried cassava products, principally chips and pellets, have constituted the core of the exports from the region to the rest of the world. Trade with non-African partners is often best assessed through importers' records of trade by origin, especially those of the EC, which has been the principal destination of cassava exports from Africa. EC trade statistics confirm that the role played by Africa as a cassava supplier has been rather marginal, since overall shipments from the region have not even accounted for one percent of the total. Moreover, EC imports from Africa have clearly shown a tendency to diminish in the 1990s, varying from 46 000 tonnes in 1990 and 1991 to less than 10 000 tonnes in 1998 and 1999.

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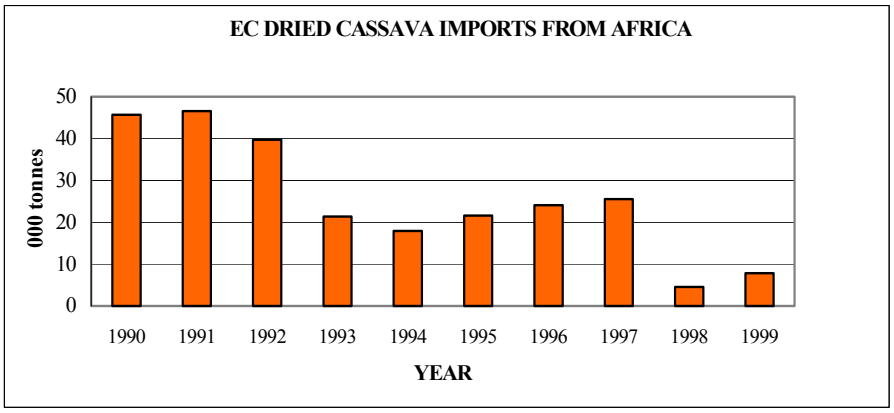
[2] Regina Kapinga, "Status of Cassava in Tanzania: Implications for Future Research and Development", Rome April 2000

[3] Benoît Dostie, Josée Randriamamonjy, Lala Rabenasolo, "La filière manioc: amortisseur oublié des vulnérables", novembre 1999

[4] Department of Agriculture, Federal Ministry of Agriculture and Natural Resources, Nigeria , "Cassava Development in Nigeria: a Country Case Study Towards a Global Strategy for Cassava Development", Rome 2000



Among the African suppliers to the EC, only Tanzania and Madagascar sold sizeable volumes in the early 1990s. Tanzania, in particular, supplied over 35 000 tonnes of dry pellets per year between 1990 and 1993, a trade carried out by private traders but which capitalized on trade relationships established earlier by the National Milling Corporation[5], the state trading agency. Since 1994, sales to the EC have dropped dramatically and have practically ceased by the end of the decade, reflecting to some extent the contraction in production observed in the country from 1995 to 1997.

Madagascar has traditionally been the second most important exporter of cassava from the region to the EC with shipments of up to 10 000 tonnes of dry chips in 1995. The pattern of these exports has been characterized by a high degree of year-to-year variability. As for Tanzania, the volume of cassava sales from Madagascar to the EC has dwindled in the past few years. The reason given by the local traders for their loss of interest in the EC market is the low f.o.b. prices, given the prevailing local price levels. Based on interviews realized in 1998-1999, they could purchase cassava pellets at 225 FMG/kg and export them at 350 FMG/kg, yielding a gross margin of 125 FMG/kg, which was considered insufficient. According to the replies, exports at the above international price would be economically justified if the chips could be bought locally at FMG 100/kg.

Ghana partially filled the void left by Tanzania and Madagascar, managing to export to the EC 15 000 tonnes in 1996 and 22 000 tonnes in 1997. However, the country's sales were much lower in subsequent years, at some 2 500 tonnes in 1998 and 7 300 in 1999, reflecting low export prices and difficulties for the export companies to raise funds to pay farmers. The sharp rise in the country's sales to overseas markets in 1996 and 1997 was a direct reflection of two private firms initiative, in particular the Transport and Commodity General Ltd, who seized the opportunity to export chips to the EC until 1998. The policy environment resulting from the adoption of a Structural Adjustment Programme in 1993 and the associated trade reforms, especially the introduction of a flexible exchange rate policy, are reported[6] to have favoured the development of the sector and to have permitted the rise in cassava exports. The interruption of the flows to the EC should be attributed to domestic production and transportation problems combined with the reduced market opportunities that the EC

[5] The state marketing agency that held a monopoly over the domestic and trade marketing of food crops between 1972 and 1985.
[6] Ghana Ministry of Food and Agriculture, "A Case Study of Cassava Development in Ghana", April 1997

has offered since the launching of the 1992 CAP reform and more recently of Agenda 2000 (see next section).

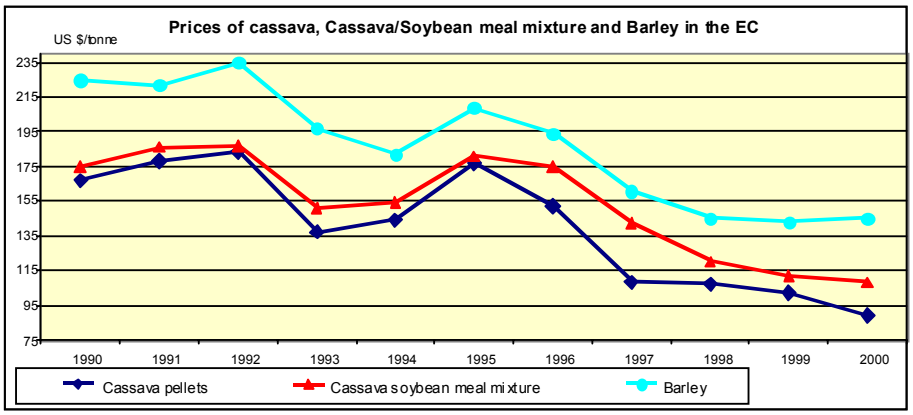
Attempts to gain access to the cassava export markets, in particular the EC, have also been made by Benin, which succeeded in selling a few thousand tonnes of chips to the Community in 1991 and 1992 and again in 1995 and 1996. Since then, no shipments from that country have been reported in the EC import statistics. Malawi has been a regular supplier of the EC chip market in the 1990s, but of very small quantities. As for the other cassava producers in the region, none of them has engaged seriously in export activities, not even Nigeria, which is the world largest cassava producer.

RECENT DEVELOPMENTS AND PROSPECTS FOR THE EC MARKET OF CASSAVA CHIPS AND PELLETS

Before the implementation of the WTO Agreements in 1995, cassava pellets were exported by African countries to the EC free of duty, under the quota reserved to countries from Africa, Caribbean and the Pacific (ACP). Actual shipments entering under this quota always fell short of the maximum allowed of 145 590 tonnes, so the ceiling did not act as a real impediment to export. Although the same preferential access has been maintained under the WTO Agreement, it is no longer reserved to ACP suppliers but is opened to WTO members other than those benefiting from country specific access (Thailand and Indonesia).

While the regulations governing the entry of cassava feed products to the EC have not been much altered by the WTO agreement, much more important for the cassava trade have been the WTO limitations on cereal export subsidies and reforms of the EC cereal regime since 1992. Intervention prices were cut by 15 percent between 1993/94 and 1995/96 under the 1992 CAP reform. This was paralleled by a fall in domestic grain market prices and, consequently with a surge in feed grain utilization in member countries. Intervention grain prices will again be cut under the Agenda 2000 by an overall 15 percent between 2000/01 and 2001/02. The objective of the cuts in intervention prices is to let domestic prices reach world levels so exports can be made on commercial terms without resorting to subsidies.

Historically, cassava has been imported into the EC at prices that have been normally 15 to 35 percent lower than the domestic prices of barley. This price differential varies from year to year, depending mainly on changes in the quotation of soybean meal, a protein component that is added to cassava in feed rations to reach nutritional levels comparable to feed grains. The relationship between the price of the cassava/soybean meal mixture and barley has also varied over time as the composite feed has been 10 to 22 percent cheaper than barley between 1990 and 2000, a difference which covers transportation and the cost of processing costs, etc.. Mainly reflecting changes in the CAP, prices of barley in Spain, a representative market and large cassava consumer, fell by 36 percent between 1990 and 1999, from US $225 to US$ 143 per tonne. The prices of Cassava pellets f.o.b. Rotterdam followed suit, falling by 39 percent from US$ 167 to US$ 102 per tonne over the same period. The slide in prices has been even more dramatic in the markets of origin such as Thailand, where hard pellets f.o.b. Bangkok, were quoted at US$ 74 per tonne in 1999, 45 percent less than in 1990.



As cassava prices in the Community have fallen, traditional exporters have found that trade much less attractive than in the past and have progressively reduced their sales to that market. Even Thailand, where the introduction of high yielding varieties has allowed the sector to raise productivity and reduce costs, has find it increasingly difficult to compete at the prevailing prices. In 1999 and 2000, the Thai Government even had to intervene by providing incentives to traders to encourage them to purchase and store cassava pellets and starch in an attempt to reduce supply and lift producer prices. These measures have not been very effective and prices have continued on a downward trend during much of the current year.

International cassava trade prospects in the medium term will no longer be linked to the price of feed grains in the EC but, more widely, to the global grain and starch markets. In fact, unless there is a drastic turnaround in the current policy drift of the EC, prices in the Community will come closer to the levels prevailing in the rest of the world, probably in few years time. Consequently, exporters of cassava products, either starch or feed, will have to compete increasingly with exporters of substitute products on the international scene. World grain prices have followed a downward tendency in the last few years with maize falling by over 40 percent between 1995/96 and 1998/99, as supplies on world markets have been ample relative to demand. While international grain prices in the medium term are likely to recover from the very low current levels, FAO envisages only moderate increases in the next ten years, as ample capacity exists among the major grain producers to swiftly respond to an expansion in demand by stepping up production.

IMPLICATIONS AND PROSPECTS FOR AFRICA

Cassava chips and pellets for feed and alcohol production

Local costs incurred in the production of cassava pellets in the region are currently very high and preclude a large participation of African countries in export except in years of particularly strong international prices of grains. For instance, according to the paper "Cassava in Africa" by Dunstan Spencer and Associates, average production costs for cassava pellets in Nigeria amounted to US $ 280 per tonne in 1996. The same year, hard pellets were priced US$ 113 per tonne on the domestic market in Thailand and US$ 152 f.o.b. in Rotterdam. However, certain countries in the region report a structure of costs that indicate some potential to access foreign markets. For instance, costs of production per hectare in Benin[7] were estimated at F CFA 316 000 in some specialized farms cultivated by young farmers. Under the assumption of relatively high yields of 25 tonnes per hectare indicated in the report, the per unit variable cost of the cassava root would amount to some US$ 17 per tonne only. This would imply a cost of US$ 42.5 for the raw material necessary to produce one tonne of cassava dried pellets[8]. More information on the processing and marketing cost structure is needed to reach an estimate of import parity price at the point of sale.

A full analysis of the *economic* import parity price for cassava has been made by Mr. Youssouf Camara[9] from data collected under COSCA project in 1989/91. The results indicate the importance of the exchange rate to ensure local cassava products could compete with foreign supplies (see annex).

Besides prices/costs, which determine the competitiveness of a supplier, sustainable trade relationships require that the flow of supply be consistent and of a reliable quality. Characteristics of the African production and marketing structure often do not allow such requirements to be met. For example, transportation and marketing bottlenecks often have a negative impact on the quality of the cassava roots or products, which may lead to their rejection upon arrival to the final destination. Most of the international feed cassava trade is carried out under the form of pellets and hard pellets, as disintegration of the chips often caused dust problems upon unloading at European ports. There might therefore be some interest in promoting the pelletizing of cassava when exporters are targeting European markets. Chips for export to the EC should be white in colour, free of extraneous matters, moulds, insect infestation and damage, have no peculiar odour and should not create dust problems in handling. The specifications of cassava chips for animal feed in the EC are as follows:

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[7] Ministère du Développement Rural, "Projet d'Organisation de la Filière du Manioc au Benin", février 1999

[8] One tonne of dry chips or pellets is equivalent to 2.5 tonne of fresh roots.

[9] Youssouf Camara, "Profitability of cassava production in West Africa: A comparative analysis (Côte d'Ivoire, Ghana and Nigeria)." Dissertation submitted to Michigan State University, August 2000.

Maximum moisture	10-14 %
Minimum starch content	70-82 %
Maximum total ash	1.8-3.0 %
Maximum sand and extraneous matter	3 %
Maximum Crude Fibre	2.1-5.0 %
Maximum cyanide	100 mg /kg
Maximum dimension (cm)	length 4-5 cm thickness 1.5 cm

Africa is currently a net importer of feed grains, which it often gets under preferential conditions from the major exporters. Although several countries have attempted to increase the use of locally produced cassava chips in the commercial feed sector, it has been with little success. Often the reason for desisting was a too high price for the dry cassava products relative to grains. Discontinuity in the supply and quality problems have also impeded their wider commercial utilization in producing countries. Changes in the international environment, especially the limitations on subsidies on grains exports faced by major developed country exporters, may facilitate a greater utilization of cassava pellets for feed or alcohol production domestically. Particular important in that regard, will be the government exchange rate policy, since an overvalued currency will tend to depress the consumption of domestically produced goods in favour of imports. High world prices of grain or starches will likewise enhance the scope for cassava to compete on the domestic and, in some instances, on international markets. Initiatives to substitute cassava chips for imported grains in feeds have been successful in Latin America. Often those initiatives are being launched by the private livestock associations, which give their technical support to cassava producers while guaranteeing them an outlet for their product. Examples of integration between producers, processors and exporters have also been reported in Benin and Ghana.

The analysis carried out so far does not yield optimistic conclusions on existing opportunities for exports of cassava chips from Africa to the rest of the world. However, producers may find growing opportunities locally and within the region to use cassava chips for feed or alcohol production instead of grains. Import substitution will often require, as one of the preconditions, a significant improvement in yields. Critical to the import substitution process is the pattern of international grain prices and, on the domestic front, exchange rate policies.

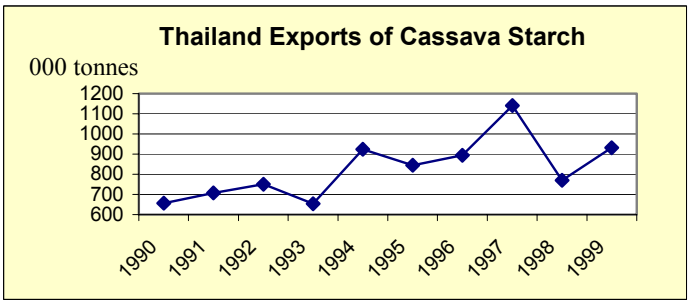
Cassava Starch and Flour

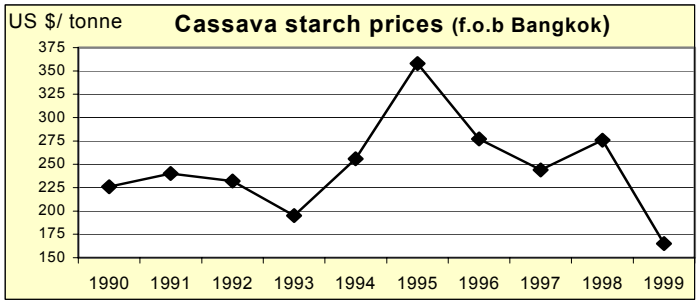
Starch can be used as an input of an almost endless number of products, for food or industrial processing, and can be consumed or traded either as native or modified starch. Annual starch consumption in Africa was estimated in 1995 at some 500 000 tonnes, including both native and modified starches and starch-derived sweeteners. Of this, 60 percent was consumed in South Africa (Rep.), 19 percent in Western Africa, 12 percent in North East Africa, 6 percent in Central Africa and 3 percent in Southern Africa[10]. From a global perspective, the region accounts for a very small share of the

[10] International Starch Institute, "Production of Cassava Starch in Uganda", August 1995

market with mere one percent of the world starch consumption. Since demand for starch is closely correlated with income growth and industrial development, market prospects in the region are brighter in the fast growing economies.

Unlike for pellets, international trade in cassava starch has been growing, even though the market temporarily shrank in 1998 in the wake of the Asian financial crisis. The cassava starch trade is dominated on the export side by Thailand, which has developed a sophisticated cassava starch industry for domestic consumption and for export. Currently, the major markets are in Asia, mainly Japan, the Republic of Korea, The Chinese Province of Taiwan, Indonesia, Malaysia and Singapore. World prices of cassava starch has followed a similar trend to cassava pellets, with export prices (f.o.b. Bangkok) falling by 27 percent from US$ 226 per tonne in 1990 to US$ 165 per tonne in 1999.





Africa does not have any apparent comparative advantage to sell cassava starch to the rest of the world in relevant quantities, being itself a net importer. However, there is a growing demand for starch within the region, which could be met by cassava. Such a potential spans from food manufacturing to industrial applications. Particularly worth mentioning are the attempts already made in the region to use cassava flour in combination with wheat flour in bread making. In Ghana, composite flours with 20 percent of cassava are reportedly used to produce bread and bakery products that are widely accepted by consumers. By contrast, in Nigeria it was reported that the composite flour bread did not fully satisfy consumers and still needed to be improved.

Fresh roots and leaves and traditional cassava food products

There is an expanding demand for fresh and traditional cassava products in foreign markets that host large expatriate populations from Africa or Latin America. Although this flow is still very limited, it is growing and commands high prices. Depending on the product, the markets are supplied on a weekly basis using air flight transportation. Fresh roots are often shipped frozen. Cassava flour, leaves, gari, etc. which can be found on western European markets or specialized shops originate mainly from countries in Latin America and Africa, especially Nigeria.

It is difficult to make an assessment of the value of that trade, which feeds "niche markets", or of its potential for growth. However, markets for selected cassava food products are expected to expand in the future as the number of people who were used to consuming cassava as a staple food increases overseas. The proximity of Africa to Europe can give to that region a comparative advantage over Asian suppliers, especially for those products that have a limited shelf life.

SUMMARY AND CONCLUSIONS

Current market conditions for cereals and recent changes in the grain policies in the EC are not supportive of an expansion of the international market for cassava feed products. On the contrary, expectations point to a sluggish international demand for cassava chips and pellets and to levels of prices substantially below those prevailing in the 1980s. Much will depend, however, on the future international grain market situation, because, unlike in the past, the price of cassava pellets will be increasingly influenced by the price of feed grain prevailing on the world market. African producers may export cassava feed products to the EC free of duty and several countries have succeeded in penetrating that market. Most of them, however, have halted that trade since 1998, as export prices have fallen to levels that were no longer remunerative. This situation is unlikely to be reversed in the medium run, unless world grain prices soar to unexpectedly high levels.

Unlike for pellets, world demand for cassava starch is rising in parallel with economic growth but the chances for some African countries to gain a foothold in the international markets are very remote given the dominant position held by Thailand and the capacity of that country to meet a potential growth in import demand at very competitive prices. Niche markets for cassava products are developing in those countries hosting large expatriate populations from Africa and Latin America and the Caribbean. This demand offers some opportunities for African countries to export relatively small quantities of cassava products, but which command high prices. The consolidation of foreign communities in host countries is frequently accompanied with the opening of restaurants proposing typical dishes. African restaurants are slowly becoming popular, which should contribute to strengthen the import demand for cassava and other African traditional food products abroad.

Most countries in the region face a number of constraints along the production chain that make their cost soar to levels that render cassava products uncompetitive not only on foreign but also on domestic markets. Also critical to the sector are the policies implemented by governments, including trade and foreign exchange policies. In this

connection, changes in the international environment since 1995 may improve the scope for increased cassava utilization locally. This will, in most cases, also require rises in productivity and major improvements downstream, in transportation, processing, etc. In some cases, integration between producers and processors may help overcome some of the constraints that are hampering the development of the sector. In particular, integration would be useful to guarantee a reliable outlet for producers and to improve the access of processors to regular supplies of suitable quality. It can also facilitate a transfer of technology and mechanization.

The country case studies produced as background documents for the Global Cassava Development Strategy (GCDS)[11], upon which this paper has greatly drawn, give an insight of the obstacles the cassava sector is facing in Africa. These constraints are not always crop-specific but of a more general nature, having to deal, for instance with a run-down infrastructure, high marketing costs, changing policies, etc.. that cannot be tackled from a sectorial viewpoint alone. The essence of the GCDS, recently approved by stakeholders at the Global Cassava Development Strategy Validation Forum, held at FAO in April 2000, is to "use a demand-driven approach to promote and develop cassava-based industries with a coalition of groups and individuals interested in developing the cassava industry". Under that perspective, the promotion of cassava products in home countries seems presently to offer greater potential than exports.

[11] The Global Development Cassava Strategy was developed between 1996 and 2000, at the initiative of the International Fund for Agricultural Development (IFAD) and with the support of FAO, the World Bank, the International Institute of Tropical Agriculture (IITA), the International Centre for Tropical Agriculture (CIAT), The United Kingdom National Research Institute (NRI), the International Cooperation Centre on Agrarian Research for Development (CIRAD), the Canadian International Development Research Centre (IDRC), Swiss Development Cooperation (SDC), the German Agency for Technical Cooperation (GTZ) and the Common Fund for Commodities (CFC).

EC Imports of Cassava Chips and Pellets (in tonnes)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
TOTAL IMPORTS	7,212,057	6,029,822	5,732,736	5,874,771	5,585,826	2,402,893	3,121,522	2,694,668	2,587,021	3,489,693
AFRICA	45,694	46,558	39,727	21,337	17,896	21,613	24,108	25,504	4,530	7,856
%	0.63	0.77	0.69	0.36	0.32	0.90	0.77	0.95	0.18	0.22
Benin	1	1,700	4,409	0	0	2,022	4,580	0	0	0
Cameroon	28	18	11	11	8	15	2	10	90	91
Congo, Dem.Rep	0	0	0	0	0	8	0	0	2	1
Congo, Rep	2		2		1	1	1	22	1	2
Côte d'Ivoire	20	7	11	7	6	14	11	2	21	41
Egypt	1	0	0	0	0	0	0	0	0	0
Gabon	0	0	0	0	0	2	0	0	0	0
Ghana	80	86	274	193	645	5,295	15,331	22,256	2,535	7,311
Guinea	5	0	0	0	0	0	0	0	0	0
Kenya	0	0	0	0	157	0	0	0	0	0
Liberia	0	0	134	0	0	0	0	0	0	0
Madagascar	9,952	3,371	2,782	511	8,896	10,203	3,100	0	1,565	91
Malawi	403	101	23	0	25	291	340	450	104	130
Mali	4	0	0	0	0	0	0	3	0	9
Mozambique	0	0	0	0	0	0	0	0	210	143
Namibia	0	0	100	0	0	0	0	0	0	0
Nigeria	1	21	3	16	23	35	743	0	0	20
South Africa	0	0	0	0	0	0	0	0	0	0
Tanzania	35,193	41,253	31,978	20,599	8,135	3,717	0	2,761	0	0
Togo	4	1	0	0	0	10	0	0	2	17

Source: Eurostat

Table A4-7: Economic Import Parity Price of Cassava Root *For Sale in Regional Output Markets,* Ghana: 1989/1991.

Items	*Regional Output Markets*	
	Koforidua	**Kumassi**
1. World Price (FOB-$ US/mt tapioca)	221	221
2. Freight and insurance ($US/mt tapioca)	8	48
3. CIF, port in Accra ($US/mt tapioca) (1+2)	269	269
4. Shadow Exchange rate (cedis / $US)	645	645
5. CIF price at the port in Accra (cedis/mt tapioca) (3*4)	173666	173666
6. Domestic costs (cedis/mt tapioca)		
a. Port charges (cedis/mt tapioca)	47227	47227
b. Transit and Transport (cedis/mt tapioca)	7233	7233
c. Storage and Handling (cedis/mt tapioca)	15276	15276
7. Accra gate price (5+ 6a…c) (cedis/mt tapioca)	243402	243402
8. Importer marketing margin (%)	5%	5%
9. Wholesale price in Accra (7* (1+ 8))	255572	255572
10. Accra to Regional Market Center		
a Distance (km)	75	254
b. Transport cost (cedis/mt tapioca)	6828	23114
c. Handling (cedis/mt tapioca)	4233	4233
11. Regional Market Center (Reference Price)		
Farmgate price (cedis/mt tapioca) (9 + 10a..c)	266630	282919
12. Wholesale marketing margin (%)	5%	5%
13. Wholesale price		
in Regional Market (cedis/mt tapioca) (11* (1+12))	279962	297065
14. Regional Market Center to Village		
a. Distance (kms)	47	83
b. Transport and Handling cost (cedis/mt tapioca)	5076	8964
15. Village gate price (cedis/mt tapioca) (13-14b)	274886	288101
16. Semi-wholesale marketing margin (%)	5%	5%
17. Village Level Semi-wholesale price ((1-16)*15)/1000	261	274
18.Transformation rate (kg of tapioca / kg of root)	0.50	0.50
19. Processing cost (cedis/kg of root)	114	114
20. Import Parity Price in the Village (cedis /kg of root) (17*18) -19	16	23

Source: COSCA data, Ghana Yearly Statistical Digests (1989-1991), Economic and Social Commission for Asia and the Pacific, Reports of 1989 through 1991.

Table A4-9a: Economic Import Parity Price of Cassava Root, by Alternative Technology Combinations. *For Sale in the Regional Output Market of Abeokuta,* Nigeria: 1989/1991.

Items	*Regional Output Market*			
	Abeokuta			
	Impmech	***Locmech***	***Locman***	***Impman***
1. World Price (FOB-$US/mt tapioca)	221	221	221	221
2. Freight and insurance ($US/mt tapioca)	48	48	48	48
3. CIF, port in Lagos ($US/mt tapioca) (1+2)	269	269	269	269
4. Shadow Exchange rate (nairas / $US)	22	22	22	22
5. CIF price at the port in Lagos (nairas/mt tapioca) (3*4)	5950	5950	5950	5950
6. Domestic costs (nairas/mt tapioca)				
a. Port charges (nairas/mt tapioca)	95	95	95	95
b. Transit and Transport (nairas/mt tapioca)	206	206	206	206
c. Storage and Handling (nairas/mt tapioca)	203	203	203	203
7. Lagos gate price (5+ 6a…c) (nairas/mt tapioca)	6454	6454	6454	6454
8. Importer marketing margin (%)	5%	5%	5%	5%
9. Wholesale price in Lagos (7* (1+ 8))	6777	6777	6777	6777
10. Lagos to Regional Market Center				
a Distance (km)	80	80	80	80
b. Transport cost (nairas/mt tapioca)	288	288	288	288
c. Handling (nairas/mt tapioca)	114	114	114	114
11. Regional Market Center (Reference Price)				
Farmgate price (nairas/mt tapioca) (9 +10a..c)	7179	7179	7179	7179
12. Wholesale marketing margin (%)	5%	5%	5%	5%
13. Wholesale price in Regional Market (nairas/mt tapioca) (11* (1+12))	7538	7538	7538	7538
14. Regional Market Center to Village				
a. Distance (kms)	34	34	34	34
b. Transport and Handling cost (nairas/mt tapioca)	176	176	176	176
15. Village gate price (nairas/mt tapioca) (13-14b)	7362	7362	7362	7362
16. Semi-wholesale marketing margin (%)	5%	5%	5%	5%
17. Village Level Semi-wholesale price (1-16)*15)/1000	6.99	6.99	6.99	6.99
18.Transformation rate (kg of tap./ kg of root)	0.50	0.50	0.50	0.50
19. Processing cost (nairas/kg of root)	3.05	3.14	3.26	3.41
20. Import Parity Price in the Village (nairas /kg of root) (17*18) -19	0.45	0.36	0.24	0.08

Source: COSCA data, UNCTAD's Review of Maritime Transport 1989-1992, Nigerian Port Authority Statistical Reports 1989-1992, UN Economic and Social Commission For Asia and the Pacific, Reports of 1989 through 1991.