

Background paper for the
**Competitive Commercial Agriculture in Sub-Saharan Africa
(CCAA) Study**

**Cassava:
International market profile**

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Cassava: International market profile

1 Introduction

Cassava is the third most important source of calories in the tropics, after rice and maize. Millions of people depend on cassava in Africa, Asia and Latin America. The broad agro-ecological adaptability of cassava and its ability to produce reasonable yields where most crops cannot makes it the basis for food security at the household level and an important source of dietary energy. The crop is an essential part of the diet of more than half a billion people and provides a livelihood for millions of farmers, and many processors and traders worldwide. Almost 60 percent of world production is concentrated in five countries Nigeria, Brazil, Thailand, Indonesia and the Congo Democratic Republic.

The bulk of world trade in cassava is in the form of pellets and chips for feed (70 percent) and the balance mostly in starch and flour for food processing and industrial use. Very little is traded in the form of fresh root, given the product's bulkiness and perishable nature. Thailand is a dominant supplier to world markets, accounting for some 80 percent of global trade; Viet Nam and Indonesia both have a share of about 8 percent; and a few countries in Asia, Africa and Latin America provide for the remainder.

Countries in the Far East are the major destination of international trade flows in cassava. Over the past few years, China has emerged as the leading cassava importer, procuring mostly feed ingredients. Presently, the country accounts for around 60 percent of the global market. China has supplanted the EU as the single most important destination for international cassava shipments. Imports by the EU have endured long-term decline. In spite of a low tariff rate preferential quota for cassava-based feedstuffs, falling grain prices in the EU coupled with environmental concerns and animal disease outbreaks have depressed demand in member states.

It is widely recognized that cassava attributes and its potential have generally not received the deserved attention by governments. This was especially the case in the past, for at the core of the green revolution, policies were geared principally towards boosting the production of cereals, leaving cassava at the periphery. However, there is now growing recognition concerning its importance as a staple crop, its contribution in fighting hunger and poverty and as an export commodity in developing countries. Nevertheless, progress in these respects remain slow. A lack of Institutional support and the direct competition between cassava and cereals in food consumption, feed and industrial uses, stand as the main obstacles to the further development of the sector. Under prevailing low international cereal prices, there is considerable pressure for cassava production and processing costs to be reduced if the crop is to gain a greater share in the food, feed and industrial markets.

Countries wishing to establish themselves as new exporters of cassava products are likely to face stiff competition from Thailand. Overcoming the competitive advantage that Thailand possesses in exporting cassava products will prove a daunting challenge, particularly in the feed and starch markets. That demand for cassava food products is anticipated to remain the leading force underpinning the sector, could provide impetus for creating new export or niche markets, since much of the growth in demand is likely to parallel a shift of consumption from fresh roots to non-perishable, processed, value-added food products. Emerging demand for biofuels could also be a future growth market for cassava, as evidenced recently in China.

2 Market Structure

2.1 Production

Cassava is cultivated in many tropical countries situated in the equatorial belt, between 30° north and 30° south of the equator, which attests to its adaptability to a wide range of ecosystems. Some of the key characteristics of the crop are its efficiency in producing carbohydrates, its tolerance to drought and to impoverished soils, even though it thrives on fertile, sandy-clay soils, and its high flexibility with respect to the timing of planting and harvesting. For these reasons, cassava plays an essential role for food security, especially in those regions prone to drought and with poor soils.

Around 60 percent of global production is concentrated in five countries Nigeria, Brazil, Thailand, Indonesia and the Congo Democratic Republic. World cassava production since the 1970s has risen on average by 2.2 percent per annum. This growth has relied on an expansion of plantings rather than on rising productivity.

Cassava Production		1970	1980	1990	2000	2005	Annual Growth (log) %	
							1970- 2005	2000- 2005
Area (000 ha)	WORLD	11,615	13,556	15,605	16,884	18,696	1.2	2.2
	Africa	6,486	7,035	8,982	10,907	12,354	1.9	2.7
	Lat. Amer. & Caribb.	2,403	2,471	2,438	2,281	2,649	-0.2	2.7
	Asia	2,485	3,803	3,941	3,468	3,429	0.6	0.1
Yields (hg/ha)	WORLD	84	91	99	105	109	0.8	0.7
	Africa	60	70	80	89	89	1.2	-0.2
	Lat. Amer. & Caribb.	121	102	107	113	117	0.1	0.9
	Asia	93	117	131	144	164	1.3	3.2
Production (000 mt)	WORLD	97,558	123,796	155,127	178,009	203,341	2.0	2.9
	Africa	39,231	48,942	71,769	96,988	109,755	3.2	2.5
	Lat. Amer. & Caribb.	32,022	27,668	28,792	28,258	34,094	-0.1	3.6
	Asia	23,102	44,419	51,687	49,937	56,082	1.9	3.3

Over 50 percent of the global crop is cultivated in Africa. Cassava area in the continent has grown markedly, almost doubling in the past three decades. Much of the expansion occurred after the severe drought of 1982-83 that led governments and farmers to re-value the crop for its adaptability to adverse growing conditions. Also around this time, a reduction of government support to cereal and cash crop production and marketing together with a cut in input subsidies under structural adjustment programmes, encouraged a shift towards the less input-demanding cassava cultivation. In some cases, this shift was also prompted by government policies aimed at reducing the

dependence on cereal imports. Yields in Africa, on the other hand, have risen much less over this period. A series of constraints, including the occurrence of pests, diseases, a low application of inputs, the relatively slow dissemination of improved cassava varieties poor farming practices and civil strife are to blame. Low cassava yields relative to their potential¹ also reflect the influence of subsistence production systems, which are mainly geared to provide a safety net, in case of cereal crop shortfalls. The increasing commercialisation of the crop in the region's larger producing countries, especially Nigeria and Ghana, is expected to pave the way for a higher output growth.

With the dismantling of public marketing agencies and the removal or reduction of price subsidies granted to cereal producers, cassava has recovered some of its comparative advantage. In the coming years, the intensification of natural resource constraints in the region, especially with regard to water availability, may play a key role in forcing the Government and the private sector to pay increased attention to the development of the cassava sector.

In Latin America and the Caribbean, production growth has been largely stagnant. Production trends in the region follow closely developments in Brazil as this country contributes over three-quarters of the regional aggregate. Government policies in the 1970s and 1980s were targeted towards the expansion of cash crops and cereal production, leaving cassava at the periphery. Market prospects are limited as the crop in the region competes directly with local cereals in diets, in feeds and in the production of starch². The loss in productivity momentum in the region coincided with a slackening of demand, however, a recent government policy enacted in Brazil which requires the mandatory blending of cassava flour with wheat flour (to curb dependence on cereal imports) could spell a revival in cassava production for the region.

In Asia, the pattern of cassava cultivation has been markedly different. The region has relied mainly on export-led productivity growth to realise a near 3 percent per annum average increase in output since the 1970s. Indeed, this rapid pace of expansion has largely been due to cassava gaining major export crop status, particularly in Thailand and Indonesia, with rising demand for dried cassava feedstuffs by the EU, and more recently in China, fuelling production growth. Both countries highlight the importance of stable and remunerative markets to foster a wide-scale adoption of improved production technologies.

2.2 Consumption: Food, feed and other use

The bulk of global cassava utilisation is in the form of food – fresh roots and processed products such as flour and fermented meal preparations - and is largely concentrated in Africa. Both cassava roots and leaves are suitable for human consumption. The first are an important source of carbohydrates and the second, of proteins and minerals. Cultivars are accordingly classified as sweet or bitter depending on their cyanide content. Bitter varieties are especially suited for industrial and feed purposes, because of their higher starch content, while sweet varieties are generally preferred if the root is to be consumed as food. A typical cassava root is composed of 70 percent moisture, 24 percent starch, 2 percent fibre, 1 percent protein and other elements which amount to 3 percent. Because of its high water content, the root is bulky and highly perishable, so processing is normally carried out within 48 hours of harvest. Thus, processing permits to enhance the value of the product by removing the naturally-occurring toxins found in the root; it reduces the weight of the product, thereby facilitating its transportation to markets; it lessens post-harvest losses arising from breakage of the roots; and extends the product's shelf-life.

1 Cassava yields vary with cultivars, season of planting, soil type and fertility. With improved varieties and under good management practices, they can reach 20-25 tonnes per hectare.

2 Despite its potential use as input for alcohol production, cassava has never seriously competed with sugarcane for ethanol production.

Cassava Utilisation		Annual Growth (log) %						
		1970	1980	1990	2000	2003	1970- 2003	2000- 2003
Utilisation (000 mt)	WORLD	97,414	123,864	159,430	178,654	193,833	2.0	2.4
	Developing	92,634	106,810	134,646	166,698	186,865	2.0	3.7
	Africa	38,890	48,721	71,386	97,263	103,864	3.2	1.9
	L. Amer.	35,035	30,371	31,592	30,705	32,255	-0.3	1.3
	& Caribb.							
	Asia & Pac.	18,907	28,006	32,905	39,278	51,385	2.1	9.7
	Developed	4,780	17,054	24,783	11,956	6,968	1.1	-20.1
EU	6,052	23,778	29,143	15,900	8,496	0.7	-16.0	
Food (000 mt)	WORLD	55,595	66,185	82,521	99,051	104,692	1.9	1.7
	Developing	55,082	65,782	81,275	98,502	104,116	1.9	1.8
	Africa	27,966	35,121	49,878	62,678	66,095	2.8	1.9
	L. Amer.	12,578	11,141	11,415	11,836	11,826	-0.2	-0.8
	& Caribb.							
	Asia & Pac.	14,736	19,808	21,177	24,505	26,724	1.3	2.7
	Developed	513	403	1,246	548	576	0.7	0.2
EU	0	0	0	0	0	0.0	0.0	
Feed (000 mt)	WORLD	27,883	41,096	54,539	48,117	50,931	1.5	1.6
	Developing	23,711	24,506	31,174	36,885	44,871	1.6	7.3
	Africa	5,279	5,765	9,678	15,970	17,535	3.9	1.9
	L. Amer.	16,685	14,304	15,095	14,095	15,245	-0.4	2.9
	& Caribb.							
	Asia & Pac.	1,747	4,436	6,401	6,820	12,091	3.8	29.5
	Developed	4,172	16,590	23,366	11,232	6,061	1.2	-22.5
EU	4,171	16,590	20,320	11,092	5,885	0.7	-16.1	
Other (000 mt)	WORLD	3,382	2,872	3,886	7,187	12,625	2.9	17.5
	Developing	3,287	2,810	3,713	7,008	12,292	2.9	17.4
	Africa	103	131	276	1,170	1,956	9.0	18.2
	L. Amer.	2,287	1,900	1,893	1,543	1,909	-1.2	5.3
	& Caribb.							
	Asia & Pac.	897	779	1,585	4,326	8,537	6.0	21.1
	Developed	96	62	172	180	333	4.1	23.7
EU	93	79	116	61	90	-0.7	6.3	

Food Consumption

On a per caput basis, growth in global cassava food consumption on average has been stagnant and has even fallen in Latin America and the Caribbean and in Asia. Such a pattern attests to the importance of cassava for low-income consumers but also highlights that the development of new food products through processing has been insufficient to counter the fall in fresh root consumption associated with increasing incomes and with migration to urban centres. Indeed, several studies have shown a negative correlation between the rate of urbanization and cassava consumption. There is less evidence of a negative relationship between cassava consumption and disposable incomes as demand for fresh cassava has been shown to increase with earnings for population groups in the low and medium income range. Despite a lack of empirical evidence on the influence of prices on the demand for cassava food products at the country level, this is likely to be strong given the tight competition with alternative foods, including cereals and other carbohydrate yielding crops.

Food Consumption		Annual Growth (log)						
		%						
		1970	1980	1990	2000	2003	1970-2003	2000-2003
Per Caput Food (kg)	WORLD	39.3	39.2	40.0	42.6	43.6	0.3	0.7
	Developing	55.3	53.2	52.7	54.3	55.2	-0.1	0.5
	Africa	211.0	201.9	214.5	209.7	207.8	0.1	-0.3
	Latin Amer. & Caribb.	106.8	74.9	62.7	57.2	54.7	-2.0	-2.2
	Asia & Pacific	18.2	20.0	15.9	16.7	17.8	-0.7	2.1

Feed

The second most important utilization of cassava world-wide is feed. At present, about one quarter of global cassava production is used as a feed ingredient for pork, poultry, cattle and fish farming, directly or indirectly through its incorporation into compound feeds. However, wide differences in utilization exist across regions. In Africa and Asia, 17 and 24 percent of cassava utilization, respectively is accounted for by feed, while in Latin America and the Caribbean the share rises to 47 percent.

Global feed utilisation has exhibited the lowest rate of growth in cassava usage. The sluggish expansion at the world level has very much been influenced by a sharp contraction of cassava feed utilization in the EU³, which had been the main engine of growth in the sector prior to the 1990s. Such growth was made possible by high domestic cereal prices which allowed cassava pellets in combination with oilmeals to compete successfully with feed grains in that market⁴. However, cereal prices in the EU declined sharply following the 1992 reform of the CAP, which provided the incentives for a greater utilization of grains by the feed industry, thereby depressing demand for cassava.

In the major producing countries, growth in cassava utilization as feed has been disappointing, as it has not kept pace with the expansion of livestock sectors. This is often attributed to the relatively high instability of supplies and prices, which makes cassava a less reliable source to the feed

³ Within the EU, the largest markets for cassava feed products are the Netherlands, Belgium, Germany, Spain and Portugal.

⁴ Cassava pellets, used as substitutes for grains in animal feed rations, need to be supplemented with protein meals (e.g. a mixture of 80 percent of cassava pellets and 20 percent soybean meals).

industry. However, in recent years, while feed cassava products still face increasing competition from grains on international markets, cassava feed usage is expanding fast, particularly in Asia where income growth is boosting the demand and production of livestock products.

Other Usage

Growth in non food and feed usage at the global level has surged in recent years. Much of this growth has been witnessed in markets for cassava starch. Starch is used as a raw material for a wide range of food products and industrial goods, including paper, cardboard, textile, plywood, glue and alcohol.⁵

Four to five tonnes of roots are normally required to produce one tonne of cassava starch, but the ratio may be as high as ten to one, depending on the quality of the root. Most of the cassava starch industries are located in Asia. In this region, processing of cassava into starch is carried out by large scale factories in Thailand, Vietnam and China. In the first country, industries for the production of cassava modified starch have been set up since the mid-1990s, often under joint-ventures with Japanese firms, for the domestic market but also to meet external demand, mostly from other Asian countries. Thailand, however, constitutes a unique case among the developing countries, as cassava starch production in most of them is limited to native starch. A number of cassava starch factories were set up in Africa in the past, such as in Uganda, Tanzania and Madagascar, but they are not currently operational. One major constraint to the industry is the unavailability of a regular flow of roots for processing. In Brazil, for instance, cassava starch industries must stop working for more than four months a year, because of a lack of raw cassava material. Price fluctuations of the roots and competitive maize prices also hinder the development of the sector.

The potential utilization of cassava as an input in manufacturing is far from being tapped in most regions and only in Thailand has there been progress in developing a well established cassava starch industry to meet domestic and export requirements. Because of the high degree of protection and complexity of the international starch markets, producers of cassava starch may find it more attractive to market their products to their domestic markets. This may imply some import substitution for competing products, especially if protected by the supplying countries, as is the case of potato starch from the EU. There is also scope for trade in cassava starch to expand since export prices appear to be competitive relative to maize or potato based starches. Thus, further progress in reducing tariff and non-tariff barriers could become a crucial condition for the furthering trade in cassava starch and flours in the future.

2.3 International trade

World trade in cassava products, excluding trade among EU countries, presently stands at about 12 percent of global production. The bulk consists of pellets and chips⁶ for feed (60 percent) and the balance of starch and flour for food and industrial uses. Trade in fresh cassava is rather limited because of the bulkiness and perishability of the roots. As a result, it is mostly confined to exchanges between bordering countries. Thailand, Vietnam and Indonesia are the major suppliers of

⁵ The suitability of the various types of starches to particular applications depends on the physico-chemical properties of the starch granules, including their size, shape and surface and their amylose and amylopectin content. The amylose/amylopectin ratio determines the viscosity, gelatinization, texture, solubility, etc. of the starch. However, the starch characteristics can be enhanced through value-addition techniques, which may be as simple as sterilization, centrifugation and pre-gelatinization, or highly complex chemical transformations. Starches that have been subject to value-additions are called "modified starches", as opposed to the unmodified "native starches".

⁶ Trade of chips is small, as these tend to disintegrate during handling and transportation.

cassava to the world market, the former contributing some 80 percent and the latter two countries around 8 percent of total trade, while the remainder is provided by small exporters in Africa, Asia and Latin America, including Ghana, Madagascar, Nigeria, Tanzania, China, Vietnam and Brazil. Exports from these countries, however, have fluctuated, hindered by the irregularity of supply and by structural problems, in particular the lack of infrastructure for inland transportation and long distances to port facilities.

Countries in the Far East are the major destination of international trade flows in cassava. Over the past few years, China has emerged as the leading cassava importer, procuring mostly feed ingredients. Presently, the country accounts for around 60 percent of the global market. The implementation of a free trade area between Thailand and China which resulted in the abolition of a 6 percent tariff on Thai cassava products has provided a boost to cassava trade between the two countries. China has supplanted the EU as the single most important destination for international cassava shipments. Imports by the EU have endured long-term decline, reflecting the reduce price competitiveness of cassava feedstuffs vis-à-vis domestically produced feed grains. This is in spite of the operation of a low tariff rate preferential import quota of over 6 million tonnes (product weight) with Thailand and Indonesia.

Fresh Cassava Trade

International trade in fresh cassava roots is mostly confined to transactions between neighbouring countries and is not usually recorded in the official statistics. Its expansion has been hampered by the bulkiness and perishability of the roots, which make them a risky product to market and an inconvenient and expensive food for the urban dweller. However, in recent years the increase in some developed countries of populations originating from Latin America and the Caribbean and from Africa has given rise to an intensification of fresh cassava trade from those regions to the North America and Europe. These markets exist owing to the discovery of paraffin coating process, or less frequently used CO₂ filled plastic bag process, that extends the shelf life of fresh cassava roots. Therefore, trade in fresh cassava roots, though still very limited, could emerge as a growth market in the future, although this will require innovative handling methods to ensure that quality roots reach their destination.

Trade in Dry Cassava Chips and Pellets.

Demand for chips and pellets for feed is closely linked to livestock production and is very sensitive to the prices of grains, with which cassava competes, and of oilmeals, a complementary ingredient in feed rations.

World trade in cassava chips and pellets expanded considerably in the 1970s and the 1980s, from less than 1.5 million tonnes (in dry weight) in 1970 to a record of 10.5 million tonnes in 1989. This remarkable increase was facilitated by the implementation of the CAP in the EU and the bounding in 1968 of the EU import tariff to a maximum 6 per cent ad-valorem duty⁷. Prior to 1992, the CAP allowed domestic cereal prices in member countries to be well above world levels in most years, thereby stimulating import demand for alternative feeds. Cassava pellets which, when supplemented with protein meals is a substitute for grains in animal rations, and accordingly fetched much higher prices in the EU than in other international markets or in the country of origin itself.

⁷ This replaced the variable import levy on cassava chips and pellets, established in 1967 at 18 percent of the barley levy.

Cassava Trade								Annual Growth (log) %	
		1970	1980	1990	2000	2004	1970- 2004	2000- 2004	
Root Equiv. (000 mt)	EXPORTS								
	World	4,510	14,242	24,999	16,424	23,390	3.3	8.9	
	Thailand	3,206	13,438	22,062	14,603	18,259	3.2	5.4	
	Viet Nam	0	0	68	380	1,874	0.4	10.6	
	Indonesia	939	1,268	2,858	728	1,659	72	64	
	IMPORTS								
	World	4,510	14,242	24,999	16,424	23,390	3.3	8.9	
	China	0	300	2,582	4,447	14,142	30.8	42.4	
	EU	0	0	14,810	8,921	5,780	96.2	-12.6	
	Korea, Rep.	0	82	1,582	807	1,204	35.5	4.1	
	Japan	246	360	1,183	614	741	2.3	2.5	
	Malaysia	9	19	147	427	642	17.5	9.0	
	Chips and Pellets (000 mt)	EXPORTS							
World		1,390	5,255	8,950	4,710	6,251	2.5	7.6	
Thailand		983	4,922	7,761	4,084	5,046	2.5	6.5	
Viet Nam		0	0	27	152	750	65.1	64.0	
Indonesia		364	490	1,099	225	264	-0.9	-8.3	
IMPORTS									
World		1,390	5,255	8,950	4,710	6,251	2.5	7.6	
China		0	29	593	871	3,477	27.4	71.4	
EU		0	0	5,903	3,538	2,250	83.1	-13.0	
Korea, Rep.		0	33	630	316	461	33.2	3.3	
Japan		1	0	221	19	32	17.0	12.3	
Malaysia		1	1	32	2	21	5.9	88.7	
Starch & Flour (000 mt)		EXPORTS							
	World	95	87	363	851	1,489	9.4	13.2	
	Thailand	0	1	253	749	1,040	50.5	6.0	
	IMPORTS								
	World	95	87	363	851	1,489	9.4	13.2	
	China	0	31	219	452	1,088	60.3	26.9	
Japan	49	72	126	113	131	1.8	1.4		

The increase in compound feed production in the EU in the 1970s and the 1980s gave an additional boost to the demand for cassava pellets, which became the major cassava product traded internationally. Since the early 1980s, EU imports of cassava feed products benefiting from the low 6 percent ad-valorem duty have been subject to quantity restrictions. Under the 1994 Uruguay Round Agreement on Agriculture (URAA), these were replaced by low tariff quotas, which maintained the same level of preferential access granted in previous years. More specifically, the Co-operation Agreement with Thailand, which allows it to ship an average 5.5 million tonnes to the EU every year. Similarly, the annual quota specifically reserved for Indonesia remains at 825 000 tonnes and, for WTO members other than Thailand and Indonesia, stands at 145 590 tonnes. Among non-WTO members, China was granted access for 350 000 tonnes and Vietnam for 30 000 tonnes⁸, also unchanged from the pre URAA levels. Cassava feed imports into the EU above the ceiling are subject to the payment of the barley import duty plus a small fee.

EU demand for feed cassava products was met mainly by Asian countries, in particular Thailand. Moreover, the surge in export demand prompted the development of technology in the main supplier countries, for instance for the transformation of the roots into hard pellets easy to handle and transport, or for the construction and equipment of ports and vessels. Thailand was at the forefront in meeting the requirements for trade expansion. In the past decade, however, falling grain prices following the 1992 CAP reform have depressed demand for cassava feed products in the EU and stalled much of the growth of production in Thailand, where the sector was highly dependent on external markets as its main outlet. However, in recent years China has emerged as the major destination for international cassava feedstuffs with a global share of some 60 percent. Growth in China's imports, to some extent has been facilitated by the implementation of a free trade area between Thailand and China which led to the abolition of a 6 percent tariff on cassava products, but the main driver of growth pertains to China's hugely expanding livestock industry.

Trade in Starches and Flours

Trade in cassava flour and starch, which represents some 30 percent of overall cassava trade, expanded markedly in recent years, compensating in part to the contraction in the international market for chips and pellets. The major cassava starch and flour importers are, by order of importance, China, Japan, Malaysia, Indonesia, Singapore, the United States and the Philippines. Again, Thailand dominates supplying about 70 percent of the global market. A major constraint to the continued expansion of the starch market is the high level of protection characterising international markets, as many countries protect their domestic starch industries.

Tariffs on cassava starch in the main importer countries range from zero in Canada, Indonesia, Malaysia and the United States to 480 percent in the Republic of Korea. In the main markets, starch is imported under preferential access conditions. Japan, for instance, has established an overall 200 000 tonnes tariff quota on native starch from maize, potato and cassava subject to a low 15 percent duty. Preferential access by the Republic of Korea has been set at a much lower level, as only 2 400 tonnes are allowed to enter paying a low 9 percent duty. The EU has also established a starch quota of 10 000 tonnes subject to specific duty per tonne tariff. Imports beyond the preferential access quota above are often charged prohibitive tariffs.

⁸ In addition to a 2 000 tonnes quota of cassava for human consumption.

3 Market Situation and Outlook

In many developing countries, other than Thailand, Viet Nam and Indonesia, cassava is thinly traded and/or traded informally. The lack of established marketing channels, poor infrastructure, poor market information and erratic supply and quality of cassava material have been among the main factors constraining trade in cassava. In addition, the competitive advantage of Thailand poses a daunting challenge to countries wishing to penetrate international markets.

To a large extent, however, the future of trade in cassava products will depend on institutional factors; in particular the policies implemented by the major importers. With domestic prices of grains in the EU maintaining a competitive edge over imported cassava feedstuffs, cassava pellet exporters will be urged to find alternative markets or to make supplies available at cheaper prices. At the same time, there is a need to cater for a reduction in international market protection, especially for cassava starch-based products.

Nevertheless, trade especially at the regional level, could be promoted through the development of local processing, the establishment of market information systems and the promotion of niche-markets for novel and speciality products. Although the bulkiness and perishability of cassava roots results in increased marketing and transport costs, making the product relatively expensive in urban areas, this constraint could be overcome through the development of processing close to the production centres. Moreover, consumption by urban dwellers could be stimulated through a diversification into new value-added cassava products, such as bread, biscuits, noodles, cakes, baby foods and sweeteners. With growing rates of migration, cassava food demand may also arise in developed countries, as already witnessed in Europe and North America. Furthermore, in these regions, there are indications that "non ethnic" communities are becoming more interested in "exotic" foods such as cassava. Unfortunately, most of the "non ethnic" market does not know what cassava is, or how to prepare it. If this particular market and indeed other markets are to expand, the product needs to be promoted.

Cassava utilization as an industrial input, notably ethanol will depend on its availability and price-competitiveness with alternative products such as maize. Such competition is anticipated to grow in the medium term, which would put increasing pressure on cassava producers and processors to lower costs of production if they wish to expand their current shares in domestic and international markets. China, however, has recently demonstrated the viability of cassava based ethanol production, by making large-scale investments in the country's production sector as well as being prepared to source cassava from international markets. In addition, the prospect of biofuel programmes in many countries around the globe could lead to a significant growth potential for cassava, especially when such programmes are based on mandated demand, which in turn could provide cassava inflows with favourable market access.