

Focus paper 2

Musa production around the world – trends, varieties and regional importance

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Introduction

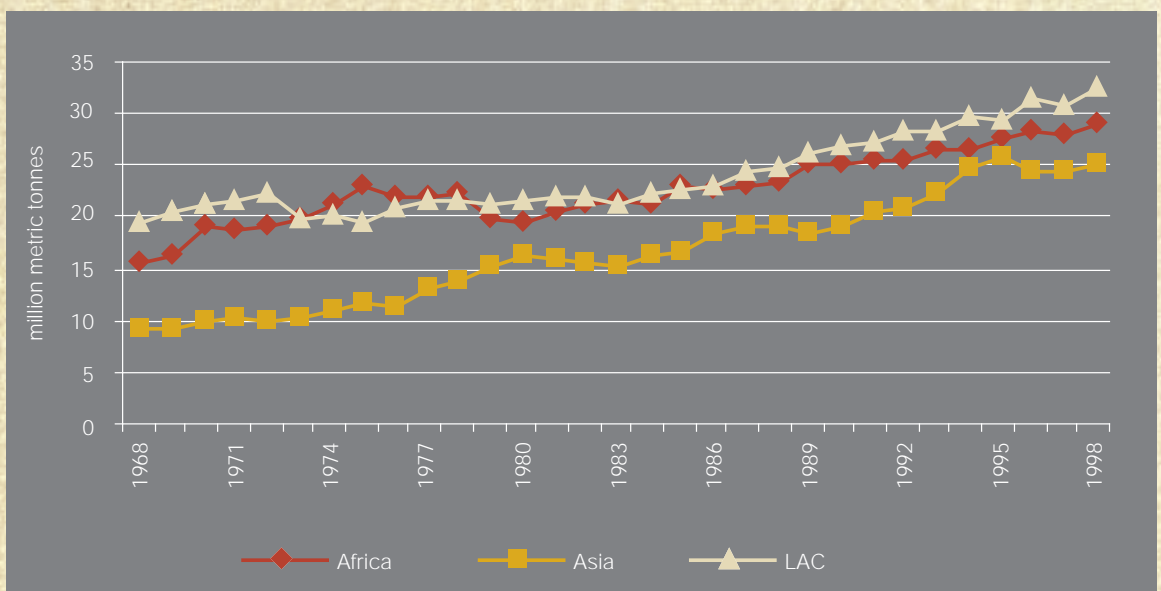
Bananas and plantains are cultivated in over 100 countries throughout the tropical and sub-tropical regions of the world. They are grown over a harvested area of approximately 10 million hectares, with an annual production of around 88 million metric tonnes, of which approximately one third is produced in each of the African, Asia-Pacific and Latin America and Caribbean regions. The vast majority of producers are small-scale farmers growing the crop either for home consumption or for local markets.

Bananas and plantains are popular for many reasons. They are one of the cheapest foods to produce. The cost of production of one kilogram of plantain for example being less than for most other staples, including sweet potato, rice, maize and yam (Chandler 1995). They will also grow in a range of

environments and will produce fruit year-round, thus providing a source of energy when other crops are not available. They are particularly suited to intercropping systems and to mixed farming with livestock and are also popular as a backyard crop in urban settings. In mixed farming systems, bananas are often used as a ground shade and nurse-crop for a range of shade-loving plants including cocoa, coffee, black pepper and nutmeg. In many countries, bananas are more than just a food crop. Among other uses they also provide an important source of fibre and are fermented to produce alcohol. (See INIBAP Annual Report 1996, Focus Paper 3).

Banana and plantain production at the global level is characterised by diversity. This diversity manifests itself in the varieties that are produced, the way they are prepared, eaten and marketed, and in the systems in which they are produced. However, within each region, certain similarities

Figure 1. Increase in Musa production by region, 1968 to 1998



can be found. This Focus Paper gives an overview of production trends at the global level, followed by a synthesis of banana and plantain production in each of the three major producing regions. Information is provided on the diversity and origins of bananas and plantains in each region and the importance of the crop for local populations.

Trends in production

Over the last thirty years, global *Musa* production has grown by 90%, from 46 million tonnes in 1968 to 88 million tonnes in 1998. This increase in production has occurred in all regions (Figure 1). At the global level, average yields of bananas and plantains have risen by around 18%, from 8.45

t/ha in 1968 to 9.96 t/ha in 1998. However this yield increase occurred primarily in Asia between 1970 and 1980 (Figure 2). Yields in Africa and Latin America and the Caribbean have not changed significantly in the last 30 years and increases in production are due almost exclusively to an expansion in the area under *Musa* production (Figure 3).

Main producing countries

Although more than 100 countries produce bananas and plantains world-wide and 22 produce more than one million tonnes per year, the top five producing countries (Table 1) account for 44% of world production.

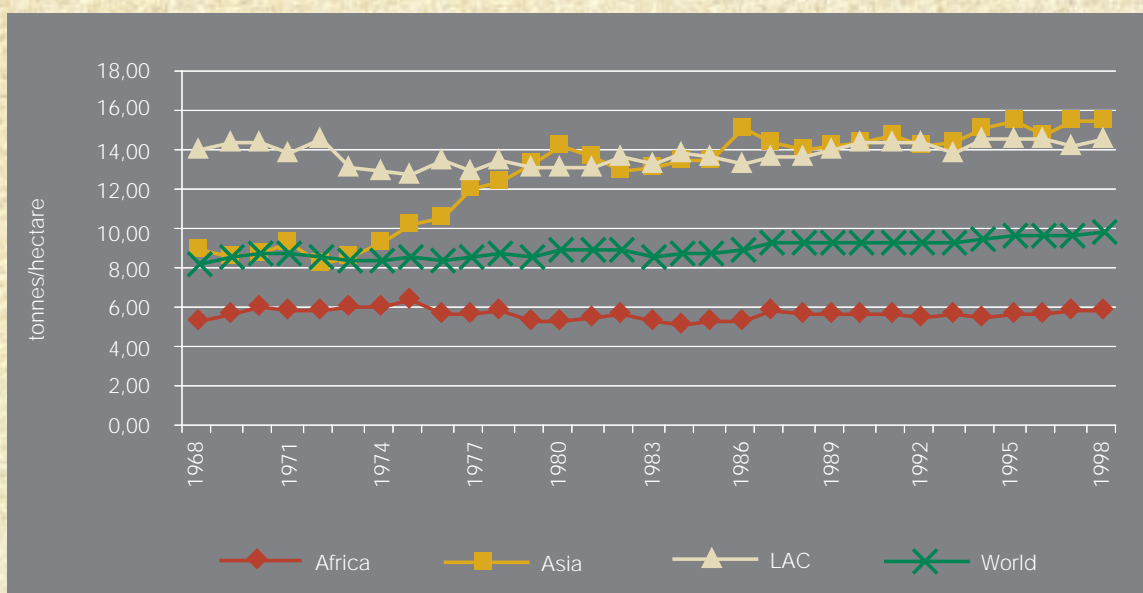


Figure 2. Increase in Musa yield by region, 1968 to 1998

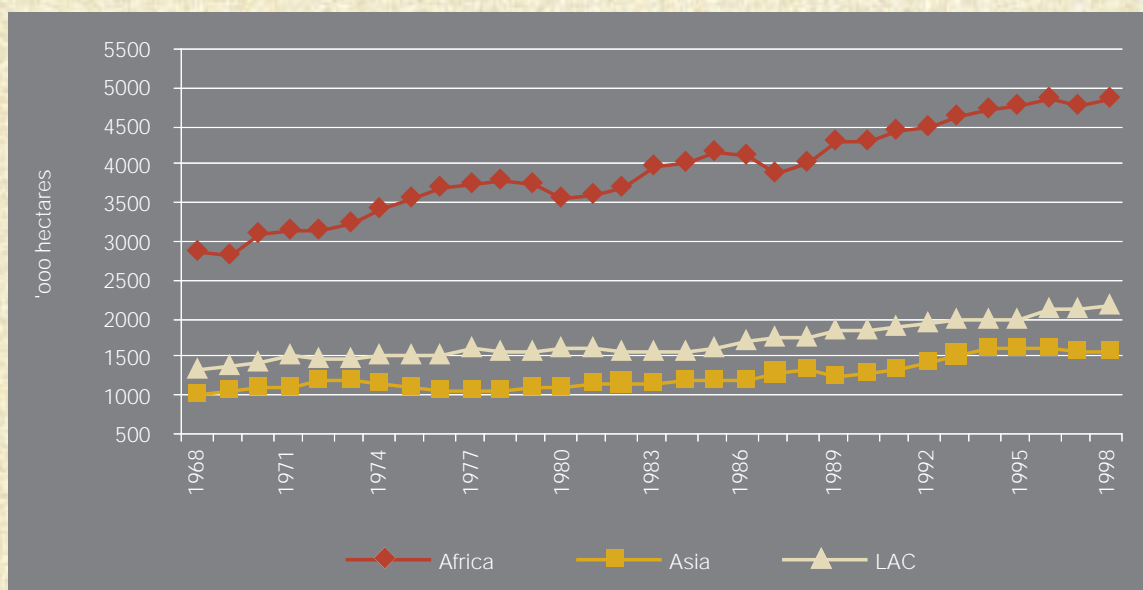


Figure 3. Increase in area of Musa by region, 1968 to 1998

Table 1. The 10 largest banana and plantain producers in 1998 (metric tonnes) (FAO 1998)

Country	Production (mT)
India	9 934 600
Uganda	9 835 000
Ecuador	8 388 210
Brazil	5 970 680
Colombia	4 797 300
Philippines	3 500 000
China	3 240 997
Indonesia	2 800 010
Democratic Republic of Congo	2 640 000
Costa Rica	2 300 000

Table 2. Banana exports 1996 (FAO 1998)

Country	Total production (mT)	Total Export (mT)	Percentage of production exported	Percentage of world exports
Ecuador	6 596 416	4 088 845	61,99%	32,97%
Costa Rica	2 505 000	2 126 493	84,89%	17,15%
Colombia	5 362 397	1 476 523	27,53%	11,91%
Philippines	3 391 150	1 252 196	36,93%	10,10%
Panama	980 562	682 827	69,64%	5,51%
Guatemala	766 000	669 686	87,43%	5,40%
Honduras	1 132 466	575 255	50,80%	4,64%
Côte d'Ivoire	1 668 825	200 551	12,02%	1,62%
Mexico	2 209 550	162 914	7,37%	1,31%
Cameroon	1 985 990	160 192	8,07%	1,29%

Main varieties

Despite the fact that bananas are the world's most traded fruit, the export crop, which is almost exclusively one variety – 'Cavendish' – accounts for little more than 13% of global banana and plantain production. The remaining 87% or so of production is made up of a very wide range of varieties, each adapted to a specific eco-region and selected for specific eating or cooking qualities. These include the true plantains (AAB) of West Africa and Central and South America, which are cooked by frying, boiling or roasting when they are green or ripe; the highland bananas (AAA) of East Africa, which are generally steamed to make 'Matooke', but are also used for beer-making; the cooking bananas (ABB) and sweet-acid dessert bananas (AAB) of Southeast Asia and the Americas; and the Pacific Maia Maoli/Popoulu (AAB) type of cooking-banana. The relative importance of the main groups of bananas is illustrated in Figure 5.

Increasing exports

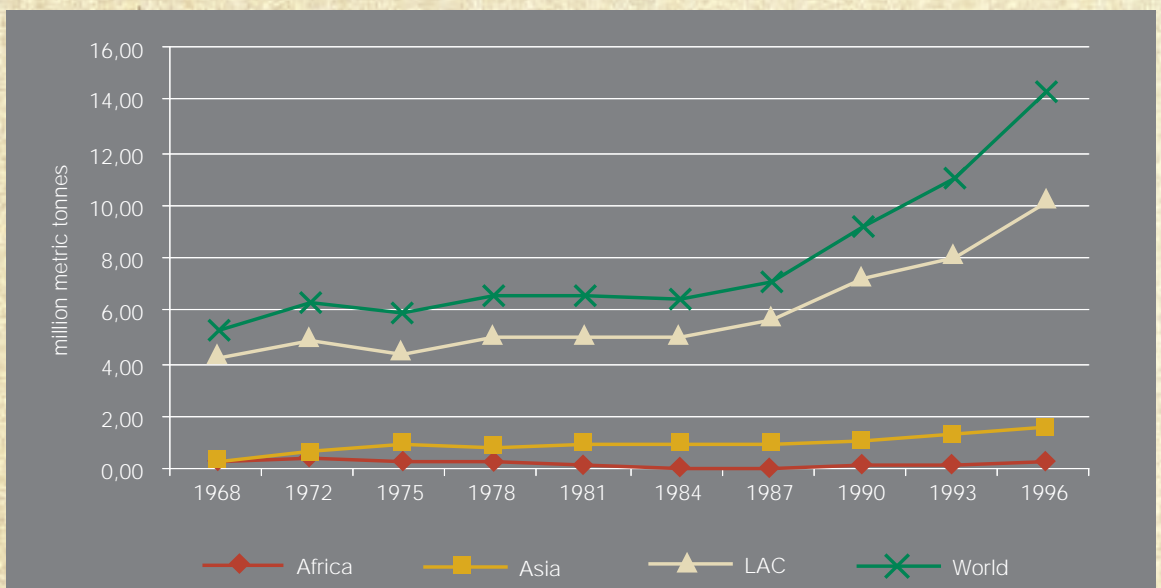
Over the last 30 years world exports of bananas have increased from just over 5 million tonnes per year in 1968 to over 12 million tonnes in 1996 (Figure 4). This represents around 13% of total *Musa* production. Growing world exports are almost entirely due to increasing exports from Latin America and the Caribbean. Banana exports from Africa and Asia together make up less than 15% of world exports, with a few countries, most notably the Philippines, dominating non-Latin American exports (Table 2).

Bananas and plantains in Asia and the Pacific

Origins

The centre of origin of the genus *Musa* is South East Asia, stretching from India to Papua New Guinea and including Malaysia and Indonesia. In this region there still exists today a large number of wild, seeded relatives of the banana. Domestication is thought to have arisen in this region as a result of mutations in these wild species resulting in the production of plants with seedless, edible fruits. Diploid (AA) and triploid

Figure 4. Banana export trends, 1968 to 1996



(AAA) *Musa acuminata* cultivars were taken by man to areas where *M. balbisiana* is native and natural hybridizations resulted in the formation of progeny with the genomes AB, AAB and ABB. (Simmonds 1962). It is thought that the subsequent dispersal of edible bananas outside South East Asia was brought about solely by man. The history of banana varieties is therefore closely linked to the early movement of human populations.

In the Pacific region, the earliest agriculture has been dated at around 8,000 BC, and it is in this region that the Fe'i bananas are of some importance (See INIBAP Annual Report 1997, Focus Paper 3). Their early cultivation has been described as 'proto-agriculture', that is, they were gathered from the wild rather than planted (Price 1995). The domestication of *M. acuminata/balbisiana* derived bananas is thought to have occurred at around the same time in South East Asia (Simmonds 1962) and it has been suggested that the earliest uses of these plants may have been non-food, or at least not involving the fruit. The plants would have produced a fibre, which could be used in fishing nets, and leaves could be used for constructing shelters. In addition, various parts of the plant apart from the fruit are edible, and the male bud is still widely used in parts of Asia as a vegetable.

Importance of the crop

In Asia, bananas are the most widely produced fruit in the Philippines, Thailand, Indonesia and India, while they rank second in Malaysia. 95% of the region's production, some 27 million tons annually, is consumed or marketed locally. Three

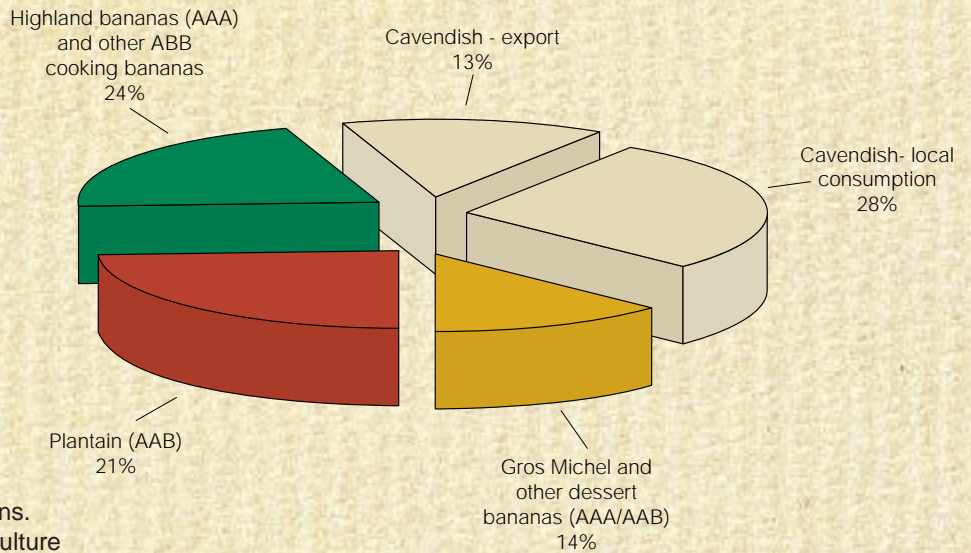


Figure 5. Major types of bananas grown worldwide

Asian countries have had a major influence on global production levels. Between 1970 and 1980, yields in the Philippines and China, two of the biggest Asian producers, increased dramatically. Yields in the Philippines rose from 4.5 to 12.9 t/ha while in China the increase was from 12 to 19 t/ha. Yield increases in the Philippines coincided with a major growth in the export industry (Figure 6), with the majority of exports destined for the Japanese market. Since the mid-1980's banana production in Asia has continued to increase, largely due to increasing acreage in India, the world's largest producer (Table 1) and China.

Production and consumption in Asia is characterised by diversity. A wide range of cultivars are produced (Figure 7) and many parts of the plant are utilised. For example, the banana "heart" may be removed from the centre of the pseudostem after harvest and cooked. Similarly, new shoots and male buds, after the removal of the outer bracts, are also cooked as vegetables. Banana fibre is also widely used throughout the region for the production of a diversity of handicrafts.

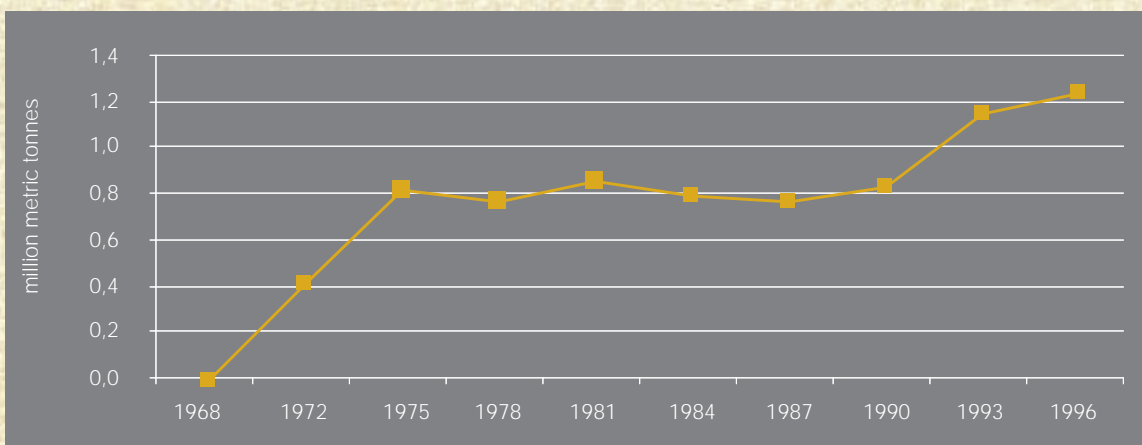


Figure 6. Increase in banana exports from the Philippines, 1968 to 1996

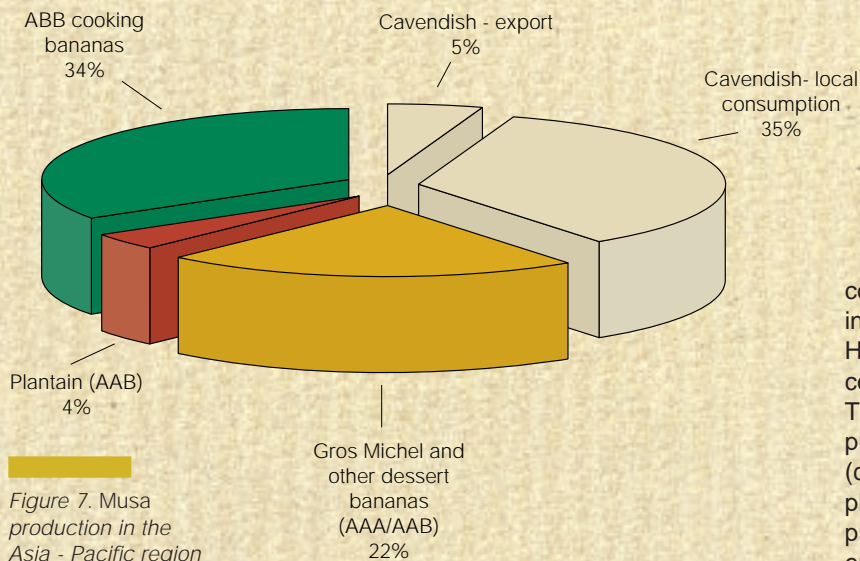


Figure 7. Musa production in the Asia - Pacific region

Bananas and plantains in Latin America and the Caribbean

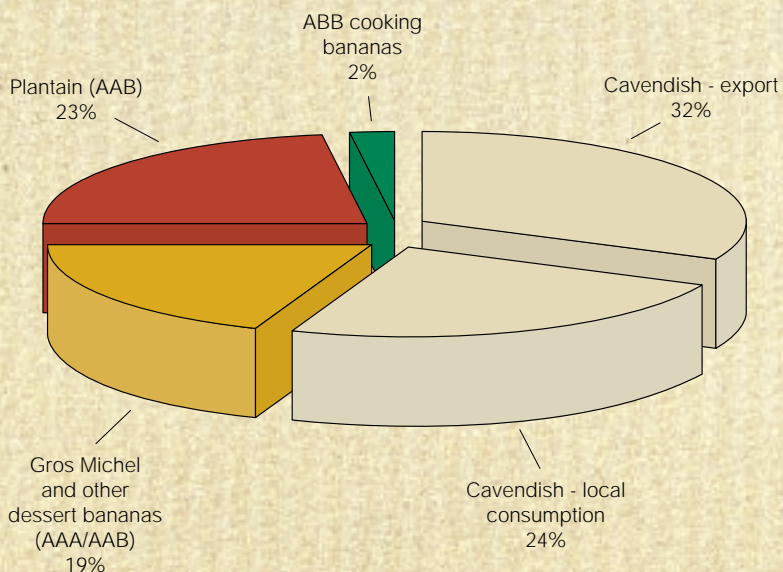
Origins

Although it is widely believed that the Portuguese were the first to introduce bananas to the Americas, the origin of the crop in the New World is still a subject of some discussion. It is thought that bananas were taken from Africa to the Canary Islands in the early 1400's, and from there, Friar Tomas de Berlanga introduced an unidentified clone to Santo Domingo in 1516 (Simmonds 1966). This is considered to be first of many such introductions over the years. However, it is also argued by some that bananas existed in South America in pre-Columbian times, and this is taken as evidence for early Polynesian contact with America. (Langdon 1993).

Importance as a food crop

Nearly 70% of the bananas and plantains produced in Latin America and the Caribbean are locally consumed (Figure 8), and plantains (AAB) play a particularly important role as a local food crop. Plantain consumption in the region reaches a peak in parts of Colombia with annual *per capita*

Figure 8. Musa production in Latin America and the Caribbean



consumption averaging 160 kg. In other countries in the region, most notably Dominican Republic, Haiti, Panama and Venezuela, plantains also constitute an important part of the national diet. Throughout the region, small businesses which produce a range of processed plantain products (chips, packed patacóns, microwaveable ripe plantain, etc.) have developed in recent years providing an increasingly important source of employment and income generation for local populations.

Export bananas

This region is most well known for the production of bananas for export, and includes seven of the top ten exporting nations (Table 2). The export banana industry, as well as providing a major source of foreign exchange for a number of Latin American countries, is also the backbone of the economies of many Caribbean countries. In some of the Windward Islands, this one crop accounts for up to 90 per cent of primary exports, 70 per cent of foreign exchange earnings and 60 per cent of agricultural employment. Production is often on steep and difficult terrain and on small family farms. In this region, bananas are the only year-round crop which can be viably cultivated to produce a regular weekly income for small scale farmers.

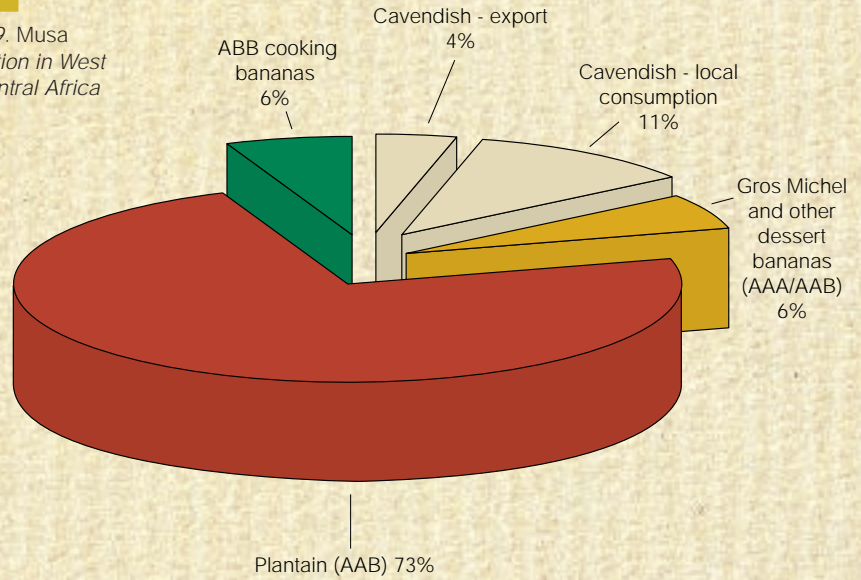
Bananas and plantains in Africa

Origins

Two main centres of banana cultivation are found in Africa: the wet tropical zones of West and Central Africa and the East African Highlands. In the west and central humid tropical areas, a very distinct type of cooking banana (plantain, AAB) is widely cultivated. Plantains are relatively rare in most of Asia as well as in other parts of Africa, and their origin in West Africa is shrouded in mystery. It is thought that they have been cultivated in this region for more than 3,000 years, but the identity of the people responsible for such cultivation is unknown (De Langhe *et al.* 1996). It is possible that the same proto-Polynesians that carried the banana east to the Pacific islands, also carried it west to Africa. Such a hypothesis fits with the finding that plantains must have reached Africa more than 3,000 years ago, but archaeological evidence for such voyages is unlikely to be found. Plantains constitute over 70% of the bananas and plantains grown in this area (Figure 9).

Another distinct group of bananas are found in the East African Highlands. These are thought to have been introduced between the 5th and 10th

Figure 9. Musa production in West and Central Africa



centuries and a wide range of unique varieties now exists here. This area of secondary diversity is clearly the work of East Bantu-speaking people, but the origins of these bananas remain unknown (De Langhe 1996). These East African Highland bananas make up around 70% of the bananas produced in this region (Figure 10).

Importance as a food crop

Bananas and plantains provide an important food source for over 100 million people in sub-Saharan Africa. Indeed the four countries with the highest *per capita* consumption of bananas and plantains in the world are found in this region (Table 3). The importance of the crop as a staple food reaches a peak in Uganda where average consumption is 243 kg/cap./year., but the crop is also extremely important in parts of Rwanda, Burundi and Tanzania. In Uganda, the staple food 'matooke', which is made from bananas, is eaten daily and the crop has great cultural and social significance. The importance of the crop is illustrated by the fact that the word 'matooke' is synonymous with the word for food in Uganda. In this region, the juice from the ripe fruit of varieties known as "beer bananas" is also drunk fresh or fermented to make a beer with a low alcohol content. Beer brewing has long been an important activity among various communities in the Great Lakes region and it is reported that consumption in Rwanda may reach 1.2 litres *per capita* per day (Stover and Simmonds 1987). The beer is important nutritionally and is rich in vitamin B due to the yeast content. In Uganda and Sudan, banana beer is also distilled to produce banana alcohol, or "waragi".

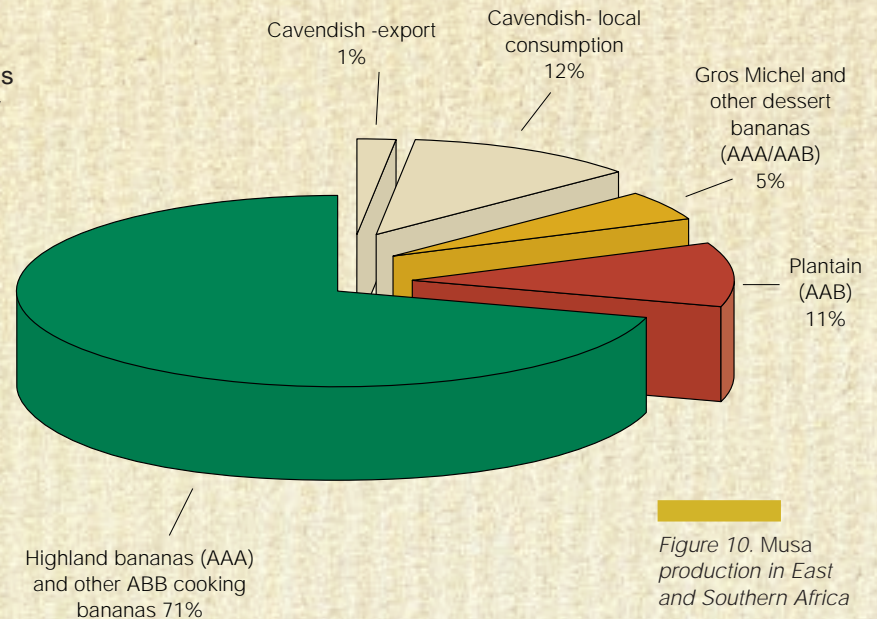


Figure 10. Musa production in East and Southern Africa

Table 3. Consumption of bananas, 1996 (kg/cap./year). (FAO 1998)

Country	Consumption (kg/cap/yr)
Uganda	243
Rwanda	197
Gabon	161
Cameroon	128
Papua New Guinea	121
Sao Tomé & Príncipe	93
Ghana	92
Burundi	89
Ecuador	88

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¹ All production data used in this paper are obtained from the FAO Agricultural Production Statistics Database (FAOSTAT) or from INIBAP, in collaboration with CIRAD-FLHOR.