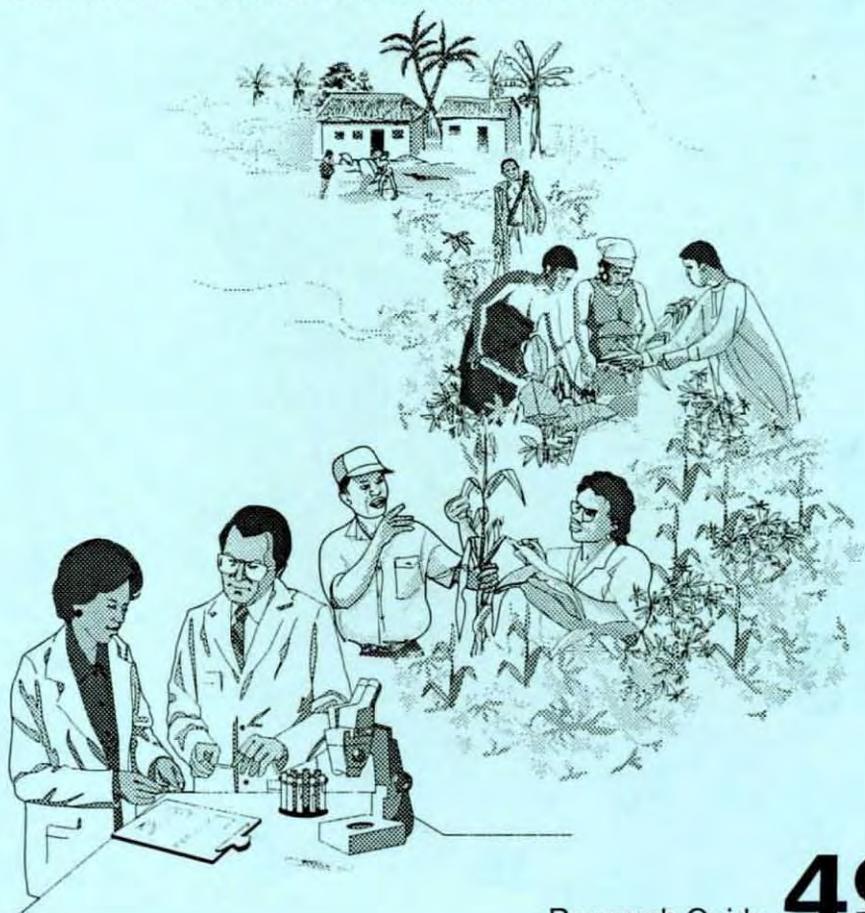




Introduction and diffusion of cassava in Africa

S.E. Carter, L.O. Fresco, P.G. Jones, J.N. Fairbairn



IITA Research Guide 49

Introduction and diffusion of cassava in Africa

S.E. Carter, L.O. Fresco, P.G. Jones, J.N. Fairbairn

July 1997

Reproduced and adapted with permission of CIAT. Original title: Carter SE, Fresco LO, Jones PG, Fairbairn JN. 1992. An atlas of cassava in Africa: historical, agroecological and demographic aspects of crop distribution. Chapter 2. The introduction and diffusion of cassava in Africa. Centro Internacional de Agricultura Tropical (CIAT), Apartado Aéreo 6713, Cali, Colombia. 86 pages, illustrations, maps. ISBN 958-9183-38-7.

International Institute of Tropical Agriculture (IITA)

Training Program

PMB 5320

Ibadan

Nigeria

Fax: (234 2) 241 2221

Telephone: (234 2) 241 2626

Telex: 31417 or 31159 TROPIC NG

E-mail (Internet): IITA@CGNET.COM

IITA Research Guides

IITA Research Guides provide information and guidance to agricultural researchers, technicians, extension specialists, and educators conducting research and training essential for agricultural development. The Research Guides are periodically updated to meet advances in scientific knowledge.

IITA permits reproduction of this Research Guide for non-profit purposes. For commercial reproduction, contact the Information Services Program of IITA.

Layout
Coordination

Nancy Ibikunle
Rainer Zachmann

Printed in Nigeria by Intec Printers, Ibadan, Nigeria
ISSN 1118-678X
ISBN 978-131-116-9

Carter SE, Fresco LO, Jones PG, Fairbairn JN. 1997. Introduction and diffusion of cassava in Africa. IITA Research Guide 49. Training Program, International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria. 33 p. 3rd edition. First published 1993.

Introduction and diffusion of cassava in Africa

Objectives. This guide is intended to enable you to:

- describe the initial introduction of cassava in Africa
- discuss the mechanisms of introduction and diffusion of cassava in Central, West, and East Africa
- explain the role of colonial and post-independence diffusion
- draw conclusions from the ways cassava was introduced in Africa

Study materials

- Maps of South America and Africa.
- Production statistics.
- Samples of traditional cassava products (*farinha*, *chikwangue*, *gari*).

Practicals

- Visit production areas and local markets and investigate the importance of cassava.

Questions

- 1 Who first brought cassava to Africa?
- 2 In what form was cassava first brought to Africa?
- 3 What was the initial purpose of cultivating cassava in Africa?
- 4 What characteristics of cassava facilitated its spread in Africa?
- 5 Who promoted the adoption of cassava in Central Africa?
- 6 Who disseminated cassava to the inland areas of pre-colonial Congo?
- 7 What routes accounted for the spread of cassava?
- 8 What are the reasons for adoption of cassava in humid forest agriculture?
- 9 What was probably the main means of diffusion of cassava across water sheds?
- 10 Why was the diffusion of cassava in West Africa universally slow?
- 11 To what effect are cassava production and diffusion attributed in Nigeria and Benin?
- 12 Who created a local demand for cassava?
- 13 Who most likely introduced 'gari'?
- 14 At what stations was cassava possibly introduced in East Africa?
- 15 What circumstances prevented the diffusion of cassava in East Africa?
- 16 What was the role of colonial governments in the diffusion of cassava?
- 17 What factors contributed to the success of cassava in Africa?

Introduction and diffusion of cassava in Africa

- 1 Initial introduction**
- 2 Central Africa**
- 3 West Africa**
- 4 East Africa**
- 5 Colonial and post-independence diffusion**
- 6 Conclusion and discussion**
- 7 Bibliography**
- 8 Suggestions for trainers**

Abstract. From the 15th to the 17th centuries, Portuguese explorers established forts, trading stations and settlements on the African coasts and nearby islands. Prior to 1600 they began to introduce cassava at these points. From there it was diffused by Africans, to reach many parts of the interior over the space of two to three hundred years.

Cassava is now found in almost all parts of tropical Africa where conditions are suitable for its cultivation. In the course of its spread across the continent, cassava has replaced traditional staples in diverse parts of tropical Africa, and its social and environmental impact is considerable, although still not fully understood. It is therefore of vital importance to our understanding of contemporary African agricultural transformations to explain the reasons for its rapid adoption.

1 Initial Introduction

Information about the process and rate of diffusion of cassava comes from historical documents and travelogues. We have tried to summarize our findings in Figure 1 (see pages 16 and 17). We know, or can speculate, how it was diffused in West and Central Africa, but East Africa is more problematic. This document synthesizes the available information on diffusion of cassava on the continent.

The Portuguese first brought cassava to Africa in the form of flour, or 'farinha'. The Tupinambá Indians of eastern Brazil had taught them techniques of cassava preparation and production, and they had developed a liking for the various processed forms.

Cassava flour was used as a provision for ships plying between Africa, Europe and Brazil. The first mention of cassava cultivation in Africa dates back to 1558. At first, it was cultivated with the sole purpose of provisioning slave ships, until about 1600.

Ross (1975) and Jones (1959) posit that multiple, and more-or-less simultaneous introductions took place at Portuguese trading stations: Fernando Po (Bioko in Equatorial Guinea), the islands of São Tomé and Príncipe, Sierra Leone, and on the Angolan coast between Luanda and the mouth of the Congo River.

Our knowledge of the diffusion of cassava in the interior during the next 250 years is extremely sparse. From the writings of European explorers who penetrated Central Africa in the late 19th century we see that cassava had by then been successfully incorporated into many farming systems.

Cassava spread through Africa by a number of mechanisms. The most important appear to have been initial contacts with the Portuguese-Brazilian culture, through which the crop gained a foothold, by river and possibly overland trade, and by mass migration.

In the late 19th and 20th centuries, colonial administrators encouraged its diffusion and increased cultivation. Cassava's botanical characteristics, such as its capacity to survive and merge in the surrounding bush vegetation and the viability of its cuttings, must have greatly facilitated this spread, as must its tolerance to long periods of neglect that arise through civil unrest.

It is also interesting to note that the consumption of cassava leaves, in frequent rather than sporadic form, was probably an African invention.

2 Central Africa

When the Portuguese introduced the crop into the Kingdom of Kongo, near the mouth of the Congo River, it was adopted as part of a process of cultural assimilation, consciously promoted by the King. Portuguese settlers and Africans both began to grow cassava.

One of the first accounts of cassava cultivation in Central Africa comes from Samuel Brun in 1611. He described flour preparation from bitter cassava roots at Loango. It is probable that cassava had already been cultivated for some years in Loango before this date. In 1620, Bras Correa witnessed cassava cultivation 'in the Brazilian manner' by Portuguese settlers at Mpinda at the mouth of the Congo River.

In 1640, the Dutch explorer Dapper mentioned Luanda (Angola) as the primary production area of cassava, giving as reasons for its cultivation:

- the infertility of the soil (which was unsuited to other crops)
- the vicinity of the town as a market
- the Portuguese pressure on 'inlanders' (natives) to produce cassava to safeguard food provisions for the town

In 1687, Cavazzi mentions cassava as the food for both poor and rich in the Kongo Kingdom (although formerly millet and sorghum were preferred to cassava). In 1704, Lucques notes that maize had been replaced by cassava as the primary staple crop.

By the middle of the 18th century, cassava was the principal food crop among the Kakongo living north of the mouth of the Congo River, and, in 1787, in the Kongo Kingdom and in Loango.

Early dissemination of cassava to inland areas, at least in precolonial Congo, was carried out solely by Africans. Europeans entered the interior only a long period afterwards, since the Congo River could not be entered from the sea.

It is assumed that cassava initially expanded throughout the territories of the western groups of the central Bantu through trade. It is likely that cassava was transported from the mouth of the Congo in a south-eastern direction, following long-distance trade routes. Its spread was probably very slow.

The Lamba, living in what is now the extreme south-east of Zaire, at the end of the trade route from Bié and Silva Porto (Nova Lisboa, Angola), knew cassava in 1852. Wood (1985) notes that cassava was only introduced to the upper Zambezi in the 1830s, by Mbunda migrants from north-east Angola, where it was already known early in the 17th century.

Pasch (1980) concludes, from linguistic studies based on the similarity of local names for cassava on the trade routes, that several of these routes accounted for the spread of the crop. The first route extended from Angola to Mozambique, while another route led probably from central Zaire to northern Zimbabwe.

A third route connected the Lozi (on the borders of present-day Zimbabwe) to the Tonga in Zambia, as is indicated for example by the fact that the term 'mwanja' (cassava) has been adapted from Lozi in Tonga. Dates of diffusion are hard to ascertain by using linguistic evidence such as this.

In contrast, the spread of cassava towards the north-east, along the Congo and its tributaries, seems to have been much faster. Riverine trade has been an obvious mechanism, but what were the reasons for its adoption? Jones (1957) hypothesizes that cassava was able to fill an important niche in humid forest agriculture, where few crops were properly adapted to the environment. He attributed this situation to the recency of occupation of much of the forest by Bantu peoples, who originated in savanna areas, and who lacked a well-adapted staple for the rain-forest.

In addition, he noted that many of the peoples of the Congo Basin were accustomed to the cultivation of bananas, a crop which required similar cultural practices, had similar harvest periods and required similar processing techniques to cassava. However, this only holds for those ethnic groups that had already developed some form of semi-sedentary shifting cultivation, and not for hunters and gatherers.

Cassava seems to have replaced millet, yam and plantain as the principal staple in most areas along the Congo River, resulting in a boost of trade in agricultural products. In 1698, cassava was already the staple food at the Stanley (Malebo) Pool, near Kinshasa. From there, it spread upriver and inland. Harms (1981) quotes as reasons for its introduction:

- high caloric production per unit area
- resistance to spoilage once processed

Cassava consumption was widespread amongst the river people. Cassava was especially suited to take along on trips, presumably in processed form such as 'chikwangué', and constituted a balanced diet in combination with fish.

The trade in cassava rapidly took on huge proportions, since the river people did not produce sufficient cassava for their own consumption.

At the end of the 19th century, one observer measured a daily shipment of 40 tons/day along the Alima River in the present-day Congo republic. Others measured 150 tons/week and 14–17 tons/day. Some tribes specialized in the trade of cassava and founded markets along the rivers. Malebo Pool was a regional center for the trade, cassava being transported from a radius of 250 km (and sometimes more) around this area.

Evidence from 19th century Francophone explorers in Central Africa supports the hypothesis of riverine diffusion. Prioul (1957), in a review of the literature on the Central African Republic, cites the riverine relations of the Oubangui as hastening the spread of cassava.

By the end of the 19th century, it was well established amongst the Oubangui, Oudda, N'dris and Gbaya (Nana Membere).

There are indications that, in the 19th century, north of Bangui and in the savannas, cassava may have been temporarily superseded as the principal contemporary staple by bananas and, in the savanna, by cereals.

However, during the present century, both cassava and maize have come to dominate agriculture in northern Congo (republic) and Central African Republic, replacing both bananas and traditional cereals such as bulrush millet.

Cassava was also introduced in Francophone Africa along coastal Cameroon, Equatorial Guinea and Gabon. Here, too, it spread along fluvial arteries, particularly along the Ogooué River to the interior of Gabon. From the Congo, it diffused to the eastern parts of these territories along the Sangha River, as far as Yokadouma in Cameroon during the 19th century.

Jones suggests that the diffusion of cassava in the interior of Cameroon, Gabon and Equatorial Guinea has occurred only during the 20th century. More recent evidence allows us to modify this picture. It is true that, in early sources of 1640, cassava was not mentioned as a food crop in the Estuaire (hinterland of Libreville) and, in 1682, it is not referred to as being in Cap Lopez, but it is very probable that cassava became more important after 1760 in Gabon, when the slave trade began to flourish.

Eventually, it became the principal food crop in the Estuaire in 1865, in Moyen-Ogooué (south of Libreville) and among the Fang. It had certainly become a widely cultivated crop in the region of Franceville in 1875. However, in some inland areas, such as Ogooué-Maritime and N'Gounié, it was seldom found.

In 1850, cassava was noted by Barth (a German traveler) in north Cameroon among the Fulani, who were probably responsible for the spread of the crop in that area. Most names for cassava in surrounding languages are related to the Fulani or Fulfulde name 'mbai'.

We may conclude that cassava must have spread by river throughout much of Central Africa during the 18th and 19th centuries. It was present on the western shores of Lakes Nyasa and Tanganyika in the second half of the 19th century when Europeans first explored the area.

In some areas, more widespread diffusion to the inter-fluves appears to have been a slower process, being dependent upon trade and hindered by political relations and possibly warfare. Prior to the imposition of European administrations, migration was probably the main means of diffusion of cassava across watersheds.

Both Wood (1985) and Prioul (1957) mention its introduction to new areas through migration. Prioul also underlines cassava's importance in areas subject to belligerent incursions in the Central African Republic: marauders could do far less damage to cassava tubers than they could to cereal crops.

More recent recurrences of this situation are the civil wars of Zaire in the early 1960s and Mozambique in the 1980s, where cassava often became the sole food source as a result of the disruption of farming activities by war.

3 West Africa

Cassava was introduced at a number of points along the West African coast during the 17th century, from the Gambia River to present-day Nigeria. Portuguese forts, trading posts and settlements were founded on the mainland and, by the end of the 17th century, cassava was present at most of these places.

Unlike Central Africa, the diffusion of cassava in West Africa was universally slow, and most of the crop's spread took place during the late 19th and 20th centuries. The principal reason was the human geography and political organization of the West African kingdoms which differed markedly from those of Central Africa. The humid coastal belt was essentially uninhabited, and formed a peripheral zone about inland capitals.

Whilst cassava may have spread inland along the Gambia River, it did not penetrate northwards along the Niger from the Portuguese station at Warri until very late. Jones notes that innovations tended to spread from the northern capitals to their southern peripheries rather than vice versa, and most West African peoples had no crops similar to cassava nor knowledge of the necessary processing techniques.

Notwithstanding this, we find occasional references to the adoption of cassava in various parts of West Africa prior to the 19th century. Although cassava seems to have been absent along the Gold Coast (Ghana) at the beginning of the 18th century, it was widely cultivated around Accra in 1785. We have insufficient information about the Guineas, Liberia and Sierra Leone to piece together the crop's diffusion in the westernmost part of the continent.

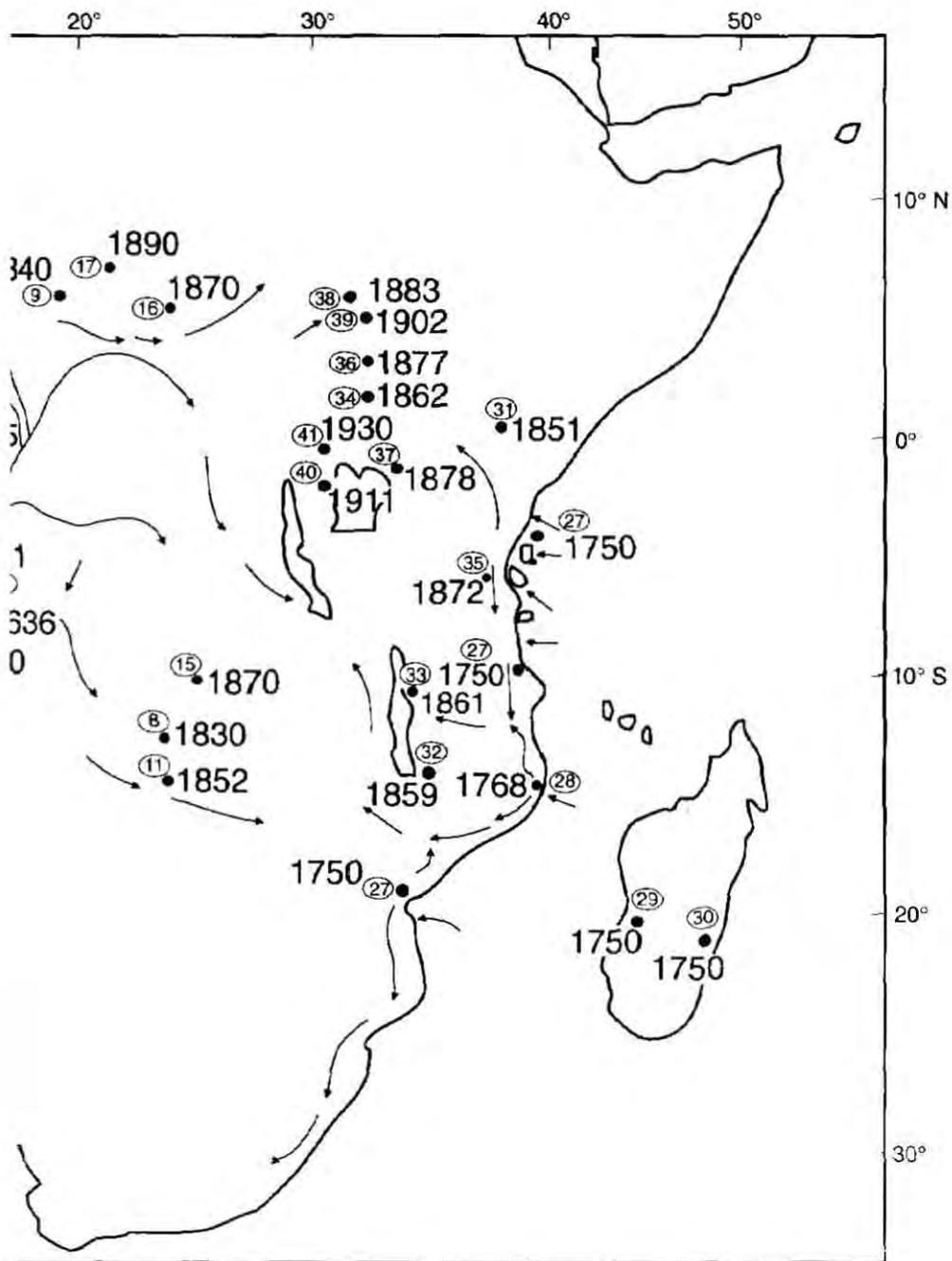
More information is available about the spread of cassava in Nigeria and Benin. The growth of cassava production and its diffusion in these countries are attributed to the catalytic effect of freed Brazilian slaves who began to return to the area around 1800. In some areas, however, cassava was already cultivated before returned slaves had visited the area. Agboola (1968) hypothesized the introduction of cassava in Benin and Nigeria in either the 17th or 18th century.

At Ouidah, in present-day Benin, the Portuguese maintained a factory staffed by Brazilians. This was the most likely source of cassava introduced to south-west Nigeria, probably with the original intention of supplying slave ships with farinha.

Igbo migration was an important diffusion mechanism in the eastern states of Nigeria. The Igbo must have been in contact with cassava since the 17th century after its introduction at Owerri.

The spread of cassava from coastal to inland areas remains obscure. Cassava was at first used as a medicine in Benin, as a cure for tuberculosis. Pasch (1980) found that from Ivory Coast (*Côte d'Ivoire*) to the Niger River, the names for cassava resembled each other closely, pointing to a common origin. She attributed great importance to the Mande peoples' diffusion of cassava in West Africa.

The Bambara were probably very influential in cassava diffusion under the Mande. One hypothesis is that the Mande took cassava from the coast to the east. In northerly areas of West Africa (among the Hausa, for example), Arabic names for cassava are more common, suggesting a route through these tribes.



rich the crop was diffused.

Slaves who returned from Brazil from the late 18th century onwards were certainly also instrumental in the spread of cassava. They became an urban class, at first controlling the slave trade, who created a local demand for cassava. Jones thought that, at the same time, they introduced the necessary processing techniques to detoxify bitter roots, although further investigation is required to determine whether processing techniques were totally unknown before the slaves' arrival.

The cassava product 'gari' was most likely introduced by slaves. At first, Africans would not have been able to distinguish the bitter from sweet varieties of the new crop. Without the means to process bitter roots, it is easy to understand their unwillingness to adopt a potentially lethal new crop.

The consumption habits and preferences of Brazilians and freed slaves and their knowledge of cultivation and processing, led to the spread of cassava production through a neighborhood effect. Urban lifestyles and the growth of a working class in the Lagos area increased demand, and local peoples emulated the habits of the Afro-Brazilians.

By mid-19th century, Badagry, Abeokuta, Lagos and Ijebu were centers of production. By 1860, the crop had reached Ibadan, and the area of production slowly coalesced. Nevertheless, expansion was slow, because of fear of poisoning, and cassava remained a cash crop for the urban markets of Lagos in most areas where it was grown.

Early travel accounts have shown that cassava was known in northern Nigeria in 1850.

In 1825, it had not been recorded by early European travelers, suggesting the entrance of cassava in about 1830–1840. It may well be that cassava reached northern Nigeria via Central Africa, through the migrations of the Fulani, rather than from coastal West Africa.

In any case, cassava was unimportant north of the Niger-Benue confluence until after World War I, and was still only of limited importance in Oyo State in 1951–1952.

As in many countries outside Central Africa, in Nigeria, cassava spread most rapidly during the 20th century. To a large extent, this was a result of governmental encouragement, because of the crop's resistance to locust attacks and drought and its consequent value as a famine reserve.

In Nigeria, the construction of north-to-south railway arteries and labor migration to the coast accelerated diffusion and increased the inland peoples' exposure to the crop. The easy incorporation of cassava into Nigerian farming systems can be attributed to its low labor requirements during growth and the flexibility of its harvest period.

Although Jones thought soil degradation to be a reason favoring cassava's adoption, Agboola maintains that there are no sources pointing to depletion of soil resources as a historical reason for cassava's diffusion in Nigeria. Where cassava's increasing importance was associated with declining fallow lengths, the latter were a result of the expansion of tree crops from the 1920s onwards.

The way in which cassava replaced and became more important than yam confirms that labor constraints and, to a lesser extent, market demand have been more important contemporary factors in the diffusion of cassava in Nigeria.

In West Africa as a whole, colonial governments played a major role in encouraging cassava cultivation during the 20th century, particularly in the savanna areas.

4 East Africa

Information on East Africa is the most speculative, and there are no concrete details on the date of cassava's introduction. We must assume that, as in West and Central Africa, it was introduced at the Portuguese trading stations: Mozambique, Benguela, Sofala, Kilwa, Zanzibar, Pemba and Mombassa, during the 17th or 18th centuries. In Figure 1 we have assumed the latter period.

Pasch (1980) reports that cassava was brought to the country of South Africa as early as the 16th century, probably from Mozambique, suggesting a long presence in the area, but this is not commonly accepted by inlanders.

Alpers (1975) claims that the first introduction in Mozambique was from Moçambique Island in 1768, although the crop could have been introduced from other areas in mainland Mozambique.

Cassava was probably introduced to Madagascar during the 18th century, prior to 1750, according to Kent (1969). This author even proposed a 16th century introduction to the island. It appears to have spread inland rapidly, being reported at Imerina near Fianarantsoa in 1785.

In Mozambique, Portuguese colonists and their African descendants were probably responsible for diffusion in the lower Zambezi Valley, but we know from Wood (1985) that cassava reached the upper Zambezi from Angola rather than Mozambique. Similarly, cassava reached Lake Tanganyika from the west, rather than the east.

Jones (1959) underlines the importance of the environmental and cultural barriers presented by the East African plains and their warlike and nomadic peoples in preventing cassava's diffusion.

In view of the successful introduction in Central Africa, it seems therefore less likely that cassava diffused along the eastern shores of Lakes Malawi and Tanganyika to the highlands of Rwanda and Burundi.

Rather, the crop may have come from the west or may, simultaneously, have spread to the highlands after being introduced in the Lake Victoria region by Arab traders, as Jones (1959) and Langlands (1966) believe. In any case, cassava was reported widely throughout the Great Lakes Region by numerous travelers in the mid-19th century. In 1883, cassava was introduced to southern Sudan by the Iddis peoples.

The most detailed information on diffusion in East Africa is that of Langlands for Uganda. It was first recorded in Buganda, north of Lake Victoria, in 1862. After its initial introduction, cassava spread only slowly. It seems that bananas were preferred as a staple.

In the first half of the 20th century, the role of the colonial administrators was central to the spread of cassava in western and northern Uganda, particularly as a famine reserve crop.

In Rwanda, Kamanzi (1983) attributes the introduction of cassava in the 1930s to the colonial administration. However, it is difficult to believe that it did not arrive from the west, if not the south, during the 19th century.

Meyer (1984) described cassava cultivation in Burundi in his journeys around 1911. He noted that sweet varieties were important, and that it was consumed in a number of different forms. This suggests considerable familiarity—inconsistent with Kamanzi's hypothesis of more recent introduction.

Similarly, we cannot exclude the possibility that cassava was already known in some parts of East Africa prior to the 20th century, without becoming an important staple crop. The reasons have to be explored, but the need for another staple may have been less pressing, or processing techniques may have been unknown. One example is among the southern Kikuyu in Kenya. Cassava was present before 1903, but was only used for medicinal or magical purposes.

In coastal Kenya, in 1911, it was reported that the primary local diet consisted of 'palm wine, cassava and mangoes, either alone or in combination', during a drought. In this latter case, whilst it is not clear whether cassava was a staple under normal conditions, its usefulness as a famine reserve was clearly recognized by local people.

From Mozambique, cassava was taken southward to its climatic limit along the eastern coast of southern Africa, also during the 19th century. Whilst relatively unimportant, it is today found in north-east Transvaal and northern Zululand.

5 Colonial and post-independence diffusion

Colonial governments played an essential role in prolonging and intensifying the diffusion of the crop throughout West and East Africa and many parts of Central Africa during the first half of this century. This period was probably the most important in extending the area of the crop's cultivation beyond the humid tropics. This encouragement of cassava cultivation by colonial governments may often have taken place in a manner insensitive to the applicability of cassava to local farming systems and food habits.

Moreover, many colonial governments displayed an ambivalent attitude towards cassava. Whilst it was introduced as an anti-famine and anti-locust crop, cassava was also thought to promote laziness, soil depletion and malnutrition.

Post-independence diffusion of the crop in Africa has primarily been the result of local processes of migration and agricultural change. There is ample evidence of the willingness of African farmers to experiment with and search for new crops and varieties. Cassava's special characteristics make it well adapted to farmers' risk aversion strategies and allow it to be grown under a great diversity of circumstances and changing economic conditions.

For example, in central Zaire, a comparison of data from colonial reports with present varieties (as acknowledged by farmers) suggests that an increasing number of varieties is grown and that the names of many of these point to recent introductions from neighboring areas or beyond.

6 Conclusion and discussion

Cassava's diffusion in Africa can be considered a fortuitous success story that highlights the flexibility and adaptability of African farming systems. Whilst the introduction of the crop at numerous points along the coast by the Portuguese formed the starting point, its acceptance, which governed the rate of diffusion, depended on cassava's particular characteristics, on ecological conditions, socio-cultural factors and regional political economies. Riverine trade and mass migration were probably the most important diffusion mechanisms, prior to the 20th century. Its diffusion was very uneven in space.

Prior to European intervention, cassava was adopted voluntarily by Africans for its particular characteristics, which are:

- ease of cultivation in shifting systems
- flexible harvest
- resistance to locust attacks
- resistance to drought

Adoption was also dependent upon factors related to postharvest processing and marketing, that is:

- adopters possessed similar knowledge or received knowledge of the necessary processing techniques (a limiting factor in West and East Africa for a long time)
- the existence of a market for the crop, amongst urban populations of Brazilian or Portuguese origin
- increased exposure to cassava as a cheap food source amongst migrant laborers, and amongst those living near points of introduction and markets

Our understanding of many of the details of the introduction of cassava in Africa remains limited. Intriguing questions relate to the emergence of the numerous cassava varieties that are found in farmers' fields today and to the way the crop was gradually incorporated into existing farming systems. With respect to the latter, we have no information on cultivation practices such as planting densities and intercropping (it is most likely that most cassava was intercropped).

Some of the evidence for Central and West Africa suggests that the crop may have been destined for the urban market at a very early stage. This could modify the classical image, held in many quarters, of cassava as a traditional food staple of Africa, and even the assertion that cassava is a 'female crop'. Unfortunately, it is not possible to relate the spread of cassava to changes in population density or to historic changes in gender roles across the continent.

The increased spread of cassava during and after the colonial period has been accompanied by profound social, economic and political changes. As a result, and because of the crop's tolerance of stresses and flexible management and harvest characteristics, cassava is now intimately bound up in the complex human and environmental systems of tropical Africa.

Table 1 summarizes trends in population growth, production, area and yield in the main cassava-producing countries. The source for these data are the FAO production yearbooks, and it should be noted that the most recent data are not always consistent with local census statistics. The FAO data are the best source of information we have on trends in cassava for Africa as a whole.

In the light of current rates of population growth, the situation is far from static. In the period between 1963 and 1986, cassava production in sub-Saharan Africa increased by an estimated 77%, as compared with a 96% population increase, while cassava area grew by 36%. In other words, yield and area increase have kept more or less the same pace, but there has been a slight relative decline in cassava production relative to population increase.

Overall trends mask marked regional differences, both between and within countries.

Table 1. Area (x 1000 ha), yield (kg/ha) and production (x 1000 t) of cassava and population growth, for selected African countries, for the periods 1961/1965, 1974/1976 and 1984/1986. (CAR = Central African Republic; -- = unknown)

	1961/1965			1974/1976			1984/1986			% change 61/65-84/86			Pop. growth 63-85 %	Prod. change /pop. growth %
	Area	Yield	Prod.	Area	Yield	Prod.	Area	Yield	Prod.	Area	Yield	Prod.		
Group 1														
CAR	204	5098	1040	293	2959	866	180	3898	702	-12	-24	-33	95	-35
Congo	134	5597	750	96	5657	540	94	6478	610	-30	16	-19	116	-16
Mozambique	430	4953	2130	533	4594	2450	563	5739	3233	31	16	52	108	48
Zaire	614	12510	7676	1687	6956	11734	2167	7093	15 369	253	-43	100	100	100
Group 2														
Angola	111	11528	1324	121	14093	1710	130	15051	1957	17	31	48	76	63
Benin	83	5888	490	82	6630	544	103	6855	706	24	16	44	79	56
Burundi	75	11798	887	71	12689	897	45	11489	517	-40	-3	-42	53	-79
Cameroon	78	5659	441	194	4348	842	410	1634	670	426	-71	52	96	54
Comoros	20	2929	58	26	3124	80	31	2918	92	55	-0.4	59	111	53
Eq. Guinea	13	3000	40	20	2425	48	25	2164	55	92	-28	38	50	76
Gabon	53	2316	122	44	2585	115	42	5928	250	-21	156	105	151	70
Ghana	150	7750	1165	253	6999	1773	359	10174	3617	139	31	210	85	247
Ivory Coast	197	2454	484	173	3734	648	257	5487	1410	30	124	191	168	114
Nigeria	832	9377	7800	1043	10322	10467	1250	10666	13333	50	14	71	106	167
Rwanda	24	6884	164	32	12255	390	42	7747	327	75	13	99	106	93
Tanzania	1559	1983	3090	877	4802	4210	450	12296	5533	-71	520	79	102	78
Togo	95	6027	571	21	20641	440	52	14711	453	-45	144	-21	89	-24
Uganda	267	3930	1051	353	3019	1067	462	8108	3891	73	106	270	115	235

Group 3														
Burkina Faso	6	5500	31	6	5882	33	5	6571	32	-17	19	3	49	6
Cape Verde	--	5000	1	--	17165	3	0.3	8220	3	--	64	200	50	400
Chad	10	4327	42	46	3331	154	67	4348	292	570	0.5	595	58	1026
Gambia	1	5376	6	3	3274	29	2	3000	6	100	-44	0	102	0
Guinea	60	7233	434	87	7000	610	71	6998	499	18	-3	15	80	19
Kenya	90	6696	600	71	8090	572	49	8000	393	-46	19	-35	133	-26
Liberia	63	4006	252	73	3541	257	87	3683	322	38	-8	28	111	25
Madagascar	165	6091	1005	204	6490	1321	358	6145	2203	117	1	119	74	161
Malawi	8	18447	140	10	5807	60	36	5957	217	350	-68	55	86	64
Mali	11	14815	160	5	7741	40	8	9043	75	-27	-39	-53	86	-62
Mauritius	--	9047	--	--	16467	--	--	14667	--	--	62	--	46	--
Niger	17	7454	126	29	6508	191	21	9081	190	24	22	51	94	54
Reunion	--	9583	5	--	9756	4	--	10012	5	--	4	0	43	0
São Tomé e Príncipe	--	10000	2	--	10506	3	--	11482	4	--	15	100	59	170
Senegal	36	4244	152	32	3101	99	5	2641	14	-86	-38	-91	94	-97
Seychelles	--	5987	--	--	6250	--	--	5000	--	--	-17	--	69	--
Sierra Leone	20	2920	59	17	4992	83	31	3477	108	55	19	83	59	141
Somalia	2	9943	17	3	10897	28	3	10883	37	50	10	118	95	124
Sudan	240	5000	1200	38	2804	107	46	2756	128	-81	-45	-89	69	-129
Zambia	46	3152	145	53	3132	166	61	3478	213	33	10	47	90	52
Zimbabwe	--	--	--	16	3020	49	20	4165	82	--	--	--	120	--

Sources: De Bruijn and Fresco 1989; FAO Production Yearbooks 1972, 1982 and 1986.

7 Bibliography

Agboola SA. 1968. The introduction and spread of cassava in Western Nigeria. *Economic and Social Studies* 10 : 369-385.

Harms RW. 1981. *River of wealth, river of sorrow*. Yale University, New Haven, CT.

Jones WO. 1959. *Manioc in Africa*. Stanford University Press, Stanford, CA. 315 pages.

Kamanzi F. 1983. Situation de la culture du manioc en milieu rural. In: *Culture et sélection du manioc et de la patate douce au Rwanda* (Ndamage G, Gatarasi TH Mulindangabo J, eds), pages 37-42. *Compte-rendu des journées d'études ISAR Rubona, 8-10 Juin 1983*. ISAR, Rubona.

Kent R. 1969. Note sur l'introduction et la propagation du manioc a Madagascar. *Terre Malgache* 5: 177-183.

Langlands BW. 1966. Cassava in Uganda 1860-1920. *Uganda Journal* 30 : 211-218.

Meyer H. 1984. *Les Barundi: Une étude ethnologique en Afrique orientale*. Société Française d'Histoire d'Outre-Mer, Paris.

Pasch H. 1980. *Linguistische Aspekte der Verbreitung Lateinamerikanischer Nutzpflanzen in Afrika*. Unpublished thesis, University of Cologne, Cologne, Germany.

Prioul C. 1957. Notes sur la diffusion du manioc dans la partie centrale du territoire Centrafricain. *Ministère du Plan, du Bangui*. 9 pages. (Typescript).

Rhoades RE. 1996. The art of the informal agricultural survey. IITA Research Guide 36. Training Program, International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria. 57 pages. 2nd edition.

Ross HB. 1975. The diffusion of the manioc plant from South America to Africa: An essay in ethnobotanical culture history. PhD dissertation. Faculty of Political Science, Columbia University, New York, USA. 135 pages.

Wood AP. 1985. A century of development measures and population redistribution along the Upper Zambezi. In: Population and Development Projects in Africa (Clarke JI, Khogali M, Kosinski LA, eds), pages 163-175. Cambridge University Press, Cambridge, UK.

8 Suggestions for trainers

If you use this Research Guide in training:

Generally:

- Distribute handouts (including this Research Guide) to trainees one or several days before your presentation, or distribute them at the end of the presentation.
- Do not distribute handouts at the beginning of a presentation, otherwise trainees will read instead of listening to you.
- Ask trainees not to take notes, but to pay full attention to the training activity. Assure them that your handouts (and this Research Guide) contain all relevant information.
- Keep your training activities practical. Reduce theory to the minimum that is necessary to understand the practical exercises.
- Use the questions on page 4 (or a selection of questions) for examinations (quizzes, periodical tests, and so on). Allow consultation of handouts and books during examinations.
- Promote interaction of trainees. Allow questions, but do not deviate from the subject.
- Respect the time allotted.

Specifically:

- Ask participants about their knowledge on introduction, diffusion and importance of cassava in their areas (10 minutes).
- Present the content of this Research Guide using the study materials listed on page 3 (45 minutes). Discuss illustrations and tables with the help of overhead transparencies (make photocopies on overhead transparency sheets from the relevant pages of this Research Guide).
- Organize visits to local production areas and markets to find out history and importance of cassava. Conduct visits and interviews in groups of 3–5 trainees. Use IITA Research Guide 36 as guidance (Rhoades 1996; see Bibliography) ($\frac{1}{2}$ day). Discuss the findings (1 hour).



International Institute of Tropical Agriculture (IITA)
Institut international d'agriculture tropicale (IITA)
Instituto Internacional de Agricultura Tropical (IITA)

The International Institute of Tropical Agriculture (IITA) is an international agricultural research center in the Consultative Group on International Agricultural Research (CGIAR), which is an association of about 50 countries, international and regional organizations, and private foundations. IITA seeks to increase agricultural production in a sustainable way, in order to improve the nutritional status and well-being of people in tropical sub-Saharan Africa. To achieve this goal, IITA conducts research and training, provides information, collects and exchanges germplasm, and encourages transfer of technology, in partnership with African national agricultural research and development programs.

L'Institut international d'agriculture tropicale (IITA) est un centre international de recherche agricole, membre du Groupe consultatif pour la recherche agricole internationale (GCRAI), une association regroupant quelque 50 pays, organisations internationales et régionales et fondations privées. L'IITA a pour objectif d'accroître durablement la production agricole, afin d'améliorer l'alimentation et le bien-être des populations de l'Afrique tropicale subsaharienne. Pour atteindre cet objectif, l'IITA mène des activités de recherche et de formation, divulgue des informations, réunit et échange du matériel génétique et encourage le transfert de technologies en collaboration avec les programmes nationaux africains de recherche et développement.

O Instituto Internacional de Agricultura Tropical (IITA) é um centro internacional de investigação agrícola pertencendo ao Grupo Consultivo para Investigação Agrícola Internacional (GCIAI), uma associação de cerca de 50 países, organizações internacionais e regionais e fundações privadas. O IITA procura aumentar duravelmente a produção agrícola para melhorar a alimentação e o bem-estar das populações da África tropical ao sul do Sahara. Para alcançar esse objetivo, o IITA conduz actividades de investigação e treinamento, fornece informações, reúne e troca material genético e favorece a transferência de tecnologias em colaboração com os programas nacionais africanos de investigação e desenvolvimento.