



Overview of Sweet potato Production Trends in Africa

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Abstract

Sweetpotato is an important crop in the world and its production in Nigeria cannot always show upwards or downwards trends due to adoption behaviour of the farmers and other constraints associated with crop production. The production in Nigeria was on increase rate for some periods and later started decreasing with some percentages when Nigerian farmers saw sweetpotato as an alternative crop that should be treated with low priorities. Africa ranked second after China in terms of sweetpotato production with 17 million tons produced. This is because the special nutrition need by people have shifted their focus to the adoption of orange flesh sweet potato for consumption due to its high content of Vitamin A. in the light of these, this paper used available literature to review the; sweetpotato production trends in Africa, sweetpotato production trends in Nigeria, sweetpotato production and different varieties of sweetpotato and socio-economic characteristics of sweetpotato producers and processors.

Keywords: *sweetpotato, production, trends, processing and production.*

Introduction

Sweet potato (*Ipomoea batatas L (Lam)*) is the seventh most important food crop after cassava among the root and tuber crops in the world and is planted throughout the tropic, subtropics, and warmer temperature regions (Santosh, Dilip, Sushil, Sanjay, Neha and Manish, 2014). Generally, sweet potato is cultivated in one hundred and eleven (111) countries in an area of 8.106 million through producing 106.569 million tones with an average productivity of 13. 147 (Ejechi, Ode and Sugh, 2020). However, Asia is the world's largest sweetpotato producing region with 88.51 million tons of annual production. China alone supplies about 76% of the world's production making the country the leading supplier of sweetpotato in the world (FAOSTAT, 2018; Ejechi, Ode and Sugh, 2020). Major Sweetpotato growing countries in each continent were considered by understanding the trends in the area, production and productivity. Sweetpotato area production globally has been showing a declined trend(Shahbandeh, 2022). It has come down from 13.36 million ha in 1961 to 8.106 million ha in 2010.It has been declining significantly at the rate of 1.0% per annum since 1961 and during 1961-1970, the rate of decline was 2.0% per annum. This was more largely seen in Asia followed by Latin America. The global reduction was due to area decrease in the Asia continent from 12.26 million ha in 1961 to 4.42 million ha in 2010. However, Africa has seen more than fivefold increase during the same period. The effect of the decline in Asia and Latin America was reduced due to more than 3% growth in sweetpotato area in Africa(Shahbandeh, 2022).

Globally, sweetpotato production has shown an upward trend with 0.1% growth per annum since 1961. The positive growth trend in global production was because of significant growth in Africa (Shahbandeh, 2022). However, the production trend in Latin America displayed significant decline while there was no significant growth in Asia. There was 4% decline in the sweet potato production during 2001-2010. Presently, 106.569 million tons of sweetpotato is produced compared to 98.19 million tons in 1961.Furthermore,Shahbandeh(2022) indicated that sweetpotato yielded globally indicated increasing trends in all the periods except during 2001-2010 where it recorded significant decline at 1.0% per annum and this to some extent compensated the effect of decline in sweet potato area on production. Research has shown that average sweetpotato yield in the world over has nearly doubled from 7.35t/ha to 13.15t/ha. Only in Asia, sweetpotato

yield showed increasing trend at 1.8% per annum while productivity of sweet potato in Latin America and Africa continents declined at 0.1% and 0.4% respectively (FAOSTAT, 2018).

Sweetpotato Production Trends in Africa

Africa is a continent with many countries which depend mostly on agriculture for their livelihood. All African countries recorded significant growth in sweetpotato area during 1961- 2010 with exception of Congo. As a whole, 3.4% annual growth was recorded in Africa continent. Currently, 34.5% of global sweetpotato area is in Africa (3.20 million naira) from a meager 4.6% cropped area in 1961 (10.62 million naira). Nigeria, Tanzania, Angola, Guinea, Ethiopia, Uganda and Rwanda recorded 10.5, 6.2, 4.1, 3.1, 3.0, 2.6 and 2.5% annual area growth rates, respectively, since 1961 (FAOSTAT,2018). In 1961 to 2010, all the major sweet potato growing Africa countries indicated positive and significant growth of 3.0% in production. However, in the African continent, Nigeria showed the highest growth rate at 7.7% followed by Tanzania, Angula, Ethiopia (3.2% each), Uganda (3.1%) most of the growth in production occurred in Eastern, central and Southern Africa in response to steadily increasing pressure in local food system due to population growth, civil way and economic hardship (FAOSTAT,2018).Nigeria, Tanzania, guinea, Congo and Angula in Africa have indicated deciling trends in yield of sweet potato during 196- 2010 while Kenbya, Uganda, Ethiopia and Burundi showed positive growth trend in sweetpotato yield. The increase in yield especially in sub-saharan Africa is difficult to achieve in the region due to poor soil nutrients, lack of irrigation and weak infrastructure (FAOSTAT,2018).

Table1: Sweetpotato Production Trends in Africa from 1961 to 2020

Country	Area	Production	Yield	Area	Production	Yield
Angula	4.3**	3.4**	-0.9**	7.2**	3.4**	5.7**
Burundi	1.9**	1.7**	-0.2**	-0.01 ^{NS}	-7.1*	7.1*
Congo	0.1 ^{NS}	-0.01 ^{NS}	-0.2**	2.3*	1.9*	-3.0**
Ethiopia	3.2**	3.3**	0.2**	7.4**	4.2**	-3.0**
Guinea	3.3**	1.6**	-1.6**	20.3*	11.4*	-7.7**
Kenya	1.6**	2.6**	1.0**	0.3 ^{NS}	3.4 ^{NS}	3.0*
Madagaskar	1.7**	1.8**	0.1 ^{NS}	4.3**	8.8**	4.2 ^{NS}
Nigeria	11.2**	8.0**	-2.9**	12.0**	1.7 ^{NS}	-9.6**
Rwanda	2.4**	2.1**	-0.2 ^{NS}	-5.1**	-4.1**	-0.9 ^{NS}
Tanzania	6.3**	3.4**	-2.8**	0.6 ^{NS}	5.5**	4.9*
Uganda	2.4**	3.1**	0.5**	0.5 ^{NS}	1.1**	0.6**

Note: ** means significant at 1%; * = significant at 5% NS= not significant; Source: FAOSTAT,2018' FAOSTAT,2021.

Sweetpotato Production Trends in Nigeria

Sweetpotato production in Nigeria cannot always show upwards or downwards trends due to adoption behaviour of the farmers and other constraints associated with crop production. Sweetpotato production in Nigeria was on increase rate for some periods later started decreasing with some percentages when Nigerian farmers saw sweetpotato as an alternative crops that should be treated with low priorities (Adesina,Abdurrasheed,Okoye, Ekah, Anedo, and Afuape,2019). Sweetpotato production in Nigeria is on the increase, this is confirmed by FAO production year book (1989-2001) which stated that sweetpotato production yield and area harvested experienced a steady increase in Nigeria from 149 thousand metric tons to 2,468 thousand metric tons in 2001. Africa ranked second after China in terms of sweetpotato production with 17 million tons produced in 2011. This is because the special nutrition need by people have shifted their focus to the adoption of orange flesh sweet potato for consumption due to its high content of Vitamin A(Adesina,2019).

Food and Agricultural organization (FAO)'s estimate on the average sweetpotato yield of 5 to 8t/ha from 1989-2001 is similar to the estimate from a survey carried out by the State Agricultural Development Programmes (ADPs) in Nigeria which reported yield of popular local varieties from 7 tons/ha in the South Eastern zones, 3.5t/ha in the northern zones, and 7t/ha to 8t/ha in Plateau and Bauchi state (FAOSTAT, 2018).Between 1961-1970, Nigeria produced 150,100 tons of sweet potato. From 1971-1980, it has increased from 150,000 tons to 101,006 000tons and this could be as a result of multiplication of area planted. However, between1981-1990 the production rate reduced to 102,900 tons. From 1991-2000; the production trend started increasing with an average output of 1,168,100 tons. From 2002-2010; there was a tremendous increase on sweetpotato output at 4,808, 400 ton, of which the crop had the tenth highest production level of any simple food crop in Nigeria after cassava, yam, oil palm fruit, maize, sorghum, millet, paddy rice and plantain. Between 2011-2017, there was a serious decrease in sweet potato output in Nigeria with an average output of 2,633, 533 tons. This decrease in output could be attributed to the total reduction of areas planted by the farmers as well as the constraints to sweetpotato production (FAOSTAT, 2018).

Table2: Estimated mean Yield of Sweetpotato Production in Nigeria from 1961- 2017

Years	Quantity production (tons)
1961-1970	150,100
1971-1980	101,006000
1981-1990	102,900
1991-2000	1,168,100
2001-2010	4,808,400
2011-2017	2, 633, 533

Source: compound production rates are author's estimated mean using secondary data from FAOSTAT, 2018. Retrieved from html POTATO/factfish% potatoes, 20 production% 20 quantity% for% 20 Nigeria.

Sweet Potatoes Production and Different Varieties of Sweet Potatoes

Sweet potato is a herbaceous, warm-weather creeping plant that belongs to *Convolvulaceae* family and genus of *Ipomoea* (Mbanaso, 2010). The family is made up of 45 genera and 1,000 species. It grows best at a temperature of between 24 0C and 28 0C with annual rainfall of 1000mm to 7000mm. Udemezue (2019) reported that *Ipomoea batatas* originated from Central America and Northwestern part of South America in about 300 B.C and later introduced into Europe in the 16th century. Production of sweet potato was encouraged by the British colonial government during the Second World War as their tubers were needed to feed their armed forces in West Africa. Since then, the impotence of potato has been widely realized such that it is now an important commodity in both local and international trade (Olagunju, *et al.*, 2013). Nigeria is one of the largest producers of sweet potato in sub-Saharan Africa with annual production estimated at 3.46 million tons per year. Sweet potato is an important food security and early maturity crop that can be intercropped with some crops like yam and maize. It can also be a mono crop based on the intentions of the farmer. A brief analysis of potato production in various countries of Africa reveals that Egypt is African's number one potato producers, followed by Malawi while Nigeria is known as the fourth biggest producer in Africa (Ugonna, Jolaoso and Onwuala, 2013).

Sweet potato of different varieties have played an important role as an energy and phytochemical source in human nutrition and animal feeding (Mohanray and Sivasankar, 2014). Also, the plant has significant medicinal importance and various parts of the plant are used in traditional medicine. According to Atungwu, Ozuzu and Tijjani (2013) in the study of categorization of ten sweet potato (*Ipomoea batatas* (L.) Lam.) varieties for resistance to *Meloidogyne* spp. in organic field, reported that sweet potatoes are grown on varieties of soils, but well-drained light and medium textured soil with a pH range of 4.5–7.0 are more favorable for the plant. Proximate information on the nutrition and health benefits of sweet potato indicated that besides simple starches, sweet potatoes are rich in complex carbohydrates, dietary fiber, between carotene (vitamin A equivalent nutrient), vitamin C and vitamin B6 (Mohanray, *et al.*, 2014) and its leaves and shoots are good sources of vitamins A, C and B2 (Riboflavin). Currently, there are over 6500 varieties of sweet potatoes worldwide (Hayati, Sabaruddin, Efendi and Anhar, 2020) and they are basically distinguished by skin color, flesh color, storage roots and some, by their origin. Sweet potato flesh is homogeneous and has secondary color diffusion, such as the color of the tuber skin. Sweet potato clones with orange and purple tuber flesh color have high beta carotene and anthocyanin content (Mbusa, Ngugi, Olubayo, Kivuva, Muthomi and Nzube, 2018), compared to sweet potato clones which have yellow, white or cream tuber flesh. The color of the tuber flesh can also reflect the concentration of pigment contained. The more concentrated the color of the tuber flesh, the higher the beta carotene content (Saraswati, Soplanit, Syahputra, Kossay, Muid, Ginting, and Lyons, 2013). Sweet potato varieties with white or pale-yellow flesh are less sweet and moist than those of red, pink or orange flesh (Neela and Fanta, 2019).

In Nigeria, more than 85% of the sweet potato production is done by farmers who maintain small farms and carry out their operations manually with traditional farm tools such as hoes and machetes (Okonkwo, Amadi and Nwosu, 2009). According to Ugonna, *et al.* (2013), the main sweet potato growing area in Nigeria is Jos Plateau and this could be attributed to its altitudes which range from 1200 to 1400m and summer temperature that rarely exceed 35⁰c which makes the temperate climate suitable for sweet potato production. Sweet potato has been identified to be the fourth most important root crop in Nigeria after cassava, yam and cocoyam (Okonkwo *et al.*, 2009). Sweet potato offers a particularly significant potential for increasing food production and income in Nigeria. Like other agricultural crops, it has a role to play in developing the economy by providing job opportunities to farmers through the increment of their income. Sweet potato is consumed without much processing in most parts of the tropics. It is either eaten boiled, roasted or fried. It could also be dried and ground into flour to make biscuits, bread and other pastries. Sweet potato can be pounded together with yam to give a delicious meal. Despite the fact that sweet potato is a crop that is being consumed in all parts of the country, yet its level of production still remains low (Mathew, 2008).

According to Mwanja, Goler and Gugu (2017), despite the high potentials of the crop as a short duration (3-4 months) crop that could be cultivated more than once in a year, its production is faced with constraints such as low yielding

varieties, difficulty in maintaining the vines during the dry season when water is scarce, scarcity of vines as planting material, inbreeding depression as a result of continuous use of vines as planting material which is characterized by decrease in vigour and yield. Similarly, in a study conducted by Mwololo, Mburu and Muturi (2012) in Kenya, it was revealed that sweet potato production constraints includes but not limited to: economic constraints such as proximity to markets and lack of marketing standards. The inability of some of the varieties to serve as a dual purpose crop creates a dilemma to the farmers because of insufficient land. The abiotic constraints identified were low soil fertility and drought while the biotic factors identified were nematodes, weevils and viruses. Sweet potato viruses are the major disease constraint and they reduce yield significantly (Barkessa, 2018). The most devastating disease is the sweet potato virus disease (SPVD), caused by dual infection with sweet potato feathery mottle virus (SPFMV) and the sweet potato chlorotic stunt virus (SPCSV). The sweet potato virus disease has been reported to occur in all areas where the crop is grown and coastal Kenya is a hot spot of SPVD and farmers have limited knowledge of the disease (Ngailo, Shimelis, Sibiya and Mtunda, 2013). In addition, the authors identified pests and diseases, unreliable markets, drought and low prices, lack of transport, lack of credit facilities and extension services as the most important constraints.

Socio-Economic Characteristics of Sweet Potato Producers/Processors

Okeke, Mbah, Madukwe and Nwalieji (2020) in the study of adoption of improved sweet potato production technologies among small-scale farmers in Southeastern Nigeria, reported that majority (64.0%) of the respondents were male, 85.0% were married with a mean age value of 55 years, having 81.0% of the respondents with a farming experience of 10-19 years. A greater percentage of the sweet potato producers sourced information on time of planting (55.0%), planting spacing (46.0%) and weeding (37.0%) from research institute while 36.0% of the sweet potato producers sourced information on fertilizer application from fellow farmers. On the other hand, in the study of factors driving adoption and constraining the non-adoption of bio-fortified orange fleshed sweet potatoes among farmers in Abia State, Chah, Anugwa and Nwafor (2020), reported that majority (76.7% and 63.3%) of both adopters and non-adopters respectively were males. For the adopters, the average years spent informal education was 13 years, while the non-adopters spent an average of 11 years. The average household size for both adopters and non-adopters was six persons per household, indicating the probable availability of household labour for the production of Orang-Fleshed Sweet Potato (OFSP). In addition, 36.7% of the adopters indicated that they cultivated sweet potato as a major crop alongside yam.

In the study of farmers' willingness to pay for quality Orange Fleshed Sweet Potato (OFSP) vines in North Central Nigeria, a study conducted by Adesina, Abdurrahman, Okoye, Ekah, Anedo and Afuape (2017), it was reported that the average age of the respondents is approximately 45 years, 77.78% were male, indicating that sweet potato production in the area is majorly male dominated activity. The study further revealed that 36.67% and 32.22% had secondary and tertiary education respectively. The average household size of the respondents is 10 members while the average monthly income of the respondents was N42,344.44. According to Sanusi, Lawal, Sanusi and Adesogan (2016) report, on the profitability of sweet potato production in derived Savannah zone of Ogun State, it was stated that 36.5% of the sampled sweet potato farmers were within the age range of 31 to 40 years. Also, majority (90.2%) of the sampled respondents were male while 9.8% were female. The study further revealed that majority (87.8%) of the respondents were married with a mean household size of 8 persons. The study also revealed that about 81.7% of the farmers had no formal education, 12.2% had primary education, 2.4% had secondary education and 3.7% had technical education. More so, many (54.9%) of the farmers had 20 years or more sweet potato farming experience, 29.3% of the farmers had other occupation aside farming which served as an additional source of income while majority (70.7%) of the sweet potato farmers were into a full time cultivation of sweet potato.

In addition, Ume, Onunka, Ochiaka and Achebe (2020) in a study of economic efficiency of orange fleshed sweet potato (OFSP) variety in Anambra State, Nigeria, indicated that the average age of OFSP farmer was 40 years. Furthermore, the study showed that an average farmer in the area had household size of 6 persons and cultivated 0.38 hectares. According to Garba (2016), the mean age of the Irish potato adopters and non-adopters farmers was 43 and 42 years with the majority of them (43% and 40%) within the age group of 40-49 years, while the active and virile age of 30-39 and 20-29 were significantly low. This implies that many of the youths in the area were not engaged in Irish potato farming activities. In that area, most of the farmers were small scale as the mean farm size was 3ha with most of the farmers cultivating between 2.0-2.99ha (31.7%) and closely followed by 3-3.99ha (22.5%), while the mean household size was 6, with maximum of 20 persons. The farming experience was 18 years. According to Olagunju, Fakayode, Babatunde and Ogunwole-Olapade (2017), the mean age of the female sweetpotato farmers (53.9%) are more than the mean age of their male counterparts (52.60%) with the youngest age of 22 years and the oldest 74 years. This means that the most of the farmers are still in their productive years. The majority of the male farmers had spent an average of 10 and half years in school while the female farmers had only spent an average of 4 years in school.

Nsuguna *et al*, (2015) in their work titled - influence of demographic characteristics on adoption of improved Irish potato varieties by small-scale farmers in Mumberes Division, Kenya reported that most of their respondents were males indicating that many of the households are male. The majority of the respondents were between the age of 20 and 40

years with average of 34.22 years. Their results also showed that most of Irish potato farmers had at least primary level of education with an average year in school being 1.59. Many of the households had family size of between 5 and 9 members with an average family size of 5 persons and only 17% of their respondents were able to access extension services. Meanwhile, a research conducted by Ezeano (2015), revealed that the majority (51.4%) of the sweetpotato farmers were male while 48.6% were female.

Mbanaso (2016), showed that 79.63% of the farmers were aware of the technology while 20.37% were not. The majority of the farmers adopted all the improved sweetpotato production practices except plant spacing. He further showed that the average age of the respondents was about 48 years and this showed that there was a relatively high proportion of middle age farmers among the respondents. The gender, 51% of the respondents were males while 49% were females. This implies that gender distribution among farmers in sweetpotato production is skewed slightly towards males. He also revealed that 14.07% of the farmers had no formal education, 26.30% had primary education and 38.89% had secondary education respectively. The mean year of farming experience was 22 years. However, the study further revealed that 59.63% of the farmers indicated farming as their major occupation, 15.92% indicated trading as major occupation, 18.52% were in civil service while 5.9% were artisans. He also showed that 60% of the farmers had contact with the extension service in the area while 40% had none. The average farm size for sweetpotato farming was 1.34 hectares.

Amengor *et al.*, (2018) reported that the average age of the household head was 46 years and it was about the same for both adopters and non-adopters. The average year of formal education was 5 years but adopters had a higher number of years than non-adopters (4 years). In their work, adopters had a significantly small household size (9) than non-adopters with a household size of 11 persons in comparison to the mean members per household across the location. This might have an influence on the food sufficiency of the households depending on resource availability. In terms of sweetpotato farming experience, non-adopters were more experienced than adopters with a mean of 25 years of experience. This means that the less experienced is more likely to adopt the variety than the more experienced. In terms of farm size, adopters had a slightly higher number of farm plots than non-adopters with a mean farm size of 4 acres across location. However, 90% of the respondents were married, but this proportion is higher among the adopters than non-adopters. The percentage of adopters belonging to farmer-based organizations was higher than that of non-adopters and this has an influence on the extent of awareness of the farmers to new technology.

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