



# Strategies for Improving Cocoyam Production among Farmers in Anambra State, Nigeria

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## Abstract

This study was informed by the need to establish the strategies for sustainable production of cocoyam which due to production and preservation challenges has witnessed decreasing producers' patronage, though it commands important economic and health values. It identified the farmers' socio-economic characteristics, cropping pattern, constraints and strategies for improving cocoyam production. Multistage, purposive and random sampling methods were used to select 120 respondents. Data were collected by means of structured interview schedule, and analyzed using frequencies, percentages, bar charts and means. Results showed that literate (69.17%), married (76.67%) and experienced (100%) farmers dominated cocoyam production. Cocoyam was majorly (96%) inter planted with vegetables, maize (80%), yam (70%) and least oil palm (30%). Serious constraints to cocoyam production were high cost of labour, scarcity of fund, high incidence of pests and diseases, low soil fertility, inadequate extension services and high cost of fertilizers. Major strategies for improving cocoyam production were the provision of adequate credit facilities, formation of cooperative societies, regular visit by extension agents and use of resistant varieties. Government intervention through the provision of cheap credit facilities, subsidization of production inputs and broadening of extension services would mitigate the problems and ensure sustainable supply of product to consumers.

**Keywords:** Cocoyam, Production strategies, Decreasing supply, Anambra Nigeria.

## INTRODUCTION

Agriculture is fundamental to the sustenance of life and is the bedrock of economic development, especially in the provision of adequate and nutritious food for human development and industrial raw materials for the industries (Adebosin, Ishola and Aina, 2011). Nigeria is a blessed country with fertile soil and right climate which is highly suitable for agricultural activities. Opportunities for agriculture-based businesses abound, however, poor implementation of government agricultural policies, inadequate budgetary allocations to the sector, scarcity of storage, processing and preservation facilities as well as production constraints have limited farmers' productivity and profitability. This development has resulted to increasing food crisis since the level of food supply is yet to keep pace with soaring demand. Increasing the supply of agricultural produce can be achieved through an efficient use of production resources and encouragement of farmers to boost their productivity and output so as to meet consumption and industrial demand (Anyiora, Osondu, Ezeh and Ababueze, 2013). Among the crops commonly produced in Nigeria, especially Anambra State are vegetables, maize, yam, cassava, and cocoyam.

Cocoyam (*Colocasia* and *Xanthosoma spp*) is a stem tuber and herbaceous perennial plant belonging to the Araceae family and constitutes one of the six most important root and tuber crops world-wide. Cocoyam is an important staple food in Nigeria and ranks third in importance after cassava and yam among the root and tuber crops cultivated and consumed (Amusa, Enete and Okon, 2011). It also plays a significant role in bridging the food gap between the time of plenty and scarcity, with all the vegetative parts being used as food in one form or the other.

The two varieties of cocoyam mainly grown in Nigeria, according to National Root Crops Research Institute (NRCRI) (2008), are *Colocasia esculenta* (L) Scott (Taro) and *Xanthosoma sagittifolium* (L) Scott (Tannia). Available data show

that Nigeria is the world's leading producer of cocoyam with an estimated 3.5 million metric tonnes in 2003. This was about 40% of the world's cocoyam production figure (Food and Agriculture Organization (FAO), 2006).

Cocoyam, as a traditional crop, is consumed in all the 36 States of Nigeria, especially the Southeast States like Anambra State, though it is generally regarded as poor man's food. It is consumed in various forms, boiled, fried, pounded or roasted. It can also be processed into chips (*achicha*) which has long shelf life and provides food all year round, especially during lean planting season. Cocoyam leaves are also used as vegetable for preparing soup in various parts of the world (Nwabuor, 2001; Asadu 2006 as cited in Onwubuya and Ajani, 2012).

Cocoyam corms are of great economic, social and nutritional importance to the people. The corms supply easily digestible starch and are known to contain substantial amounts of protein, vitamin C, thiamine, riboflavin, niacin and significant amount of dietary fiber (Enwelu, Asogwa, Nwalieji and Ezeano, 2014). Cocoyam is believed to be generally good for the body and has some medicinal values. Consumption of micronutrient rich food such as cocoyam is important for a strong immune system that helps the body to utilize protein, carbohydrates and other nutrients. Cocoyam (Taro) contains some calcium, vitamin C, vitamin E and B vitamins, as well as magnesium, manganese, copper and fiber which aids in the digestive process, makes elimination of stool easy and also helps in cancer prevention (Nwagbo, 2011).

Expansion in cocoyam production has the potential of bridging the widening demand and supply gap for the product, and enhancing the income and standard of living of the farmers, particularly the vulnerable group (Amusa *et al.*, 2011). As population pressure on land continues to increase, the importance of cocoyam in ensuring household food security should be given adequate recognition, and efforts to increase production of the crop through encouraging the adoption of modern production strategies and mitigation of production constraints such as climate change, drought, poor cultural practices among cocoyam growers, pest and disease infestations and lagging interest of youths in agriculture (Sagoe, 2006; Onwubuya and Ajani, 2012) must be stepped up.

Based on this backdrop, the study examined the strategies for improving cocoyam production among farmers in Anambra State, Nigeria with the following specific objectives: describing the socio-economic characteristics of the cocoyam farmers; ascertaining the cocoyam cropping system; identifying factors constraining effective production of cocoyam; and identifying the strategies for improving production of cocoyam in the area.

## METHODOLOGY

The study was carried out in Anambra State, Nigeria. Anambra State consists of four agricultural zones, namely; Aguata, Anambra, Awka and Onitsha. Multistage, purposive and random sampling techniques were used to select 120 respondents. Stage I involved the purposive selection of two agricultural zones (Anambra and Onitsha zones). This selection was based on the dominance of cocoyam farmers from the State in the two zones, informed by the list of farmers obtained from the Anambra State Agricultural Development Programme (ASADEP). The two zones consist of 10 extension blocks (Local Government Areas) and 60 circles. Stages II and III witnessed the random selection three blocks from each of the selected zones and two circles from each of the six selected blocks giving a total of 12 circles. From each of the circles, 10 cocoyam farmers were randomly selected to arrive at the sample size of 120 respondents at stage IV.

Questionnaires were administered to the respondents through personal interview by trained enumerators for primary data collection. To ascertain the cocoyam cropping system adopted by the farmers, a list of possible cropping combinations were compiled and the respondents indicated the ones involved in. To identify factors constraining effective production of cocoyam in the area, a list of possible constraining factors was compiled and investigated under four point Likert-type scale rating from strongly agree (4), agree (3), disagree (2) and to strongly disagree (1) with a mid-point of 2.5. Mean score equal to 2.5 and above indicated major constraining factor while mean score less than 2.5 indicated non-constraining factor. To describe the possible strategies for improving cocoyam production, a list of possible strategies was compiled and assessed based on a three point Likert-type scale with response options as not serious (1), serious (2) and very serious (3) with a mid point of 2.0. Mean score equal to 2.0 and above indicated major strategy while mean score less than 2.0 indicated minor strategy for improving cocoyam production in the area. Data were analyzed using frequencies, percentages, bar charts, and means.

## RESULTS AND DISCUSSION

### Socio-economic characteristics of the cocoyam farmers

Table 1 gives an insight into the socio-economic characteristics of the respondents. The results showed that majority (95%) of the respondents were females while only 5% were males. This finding confirms the general believe in rural

**Table 1.** Distribution of the farmers according to socio-economic characteristics

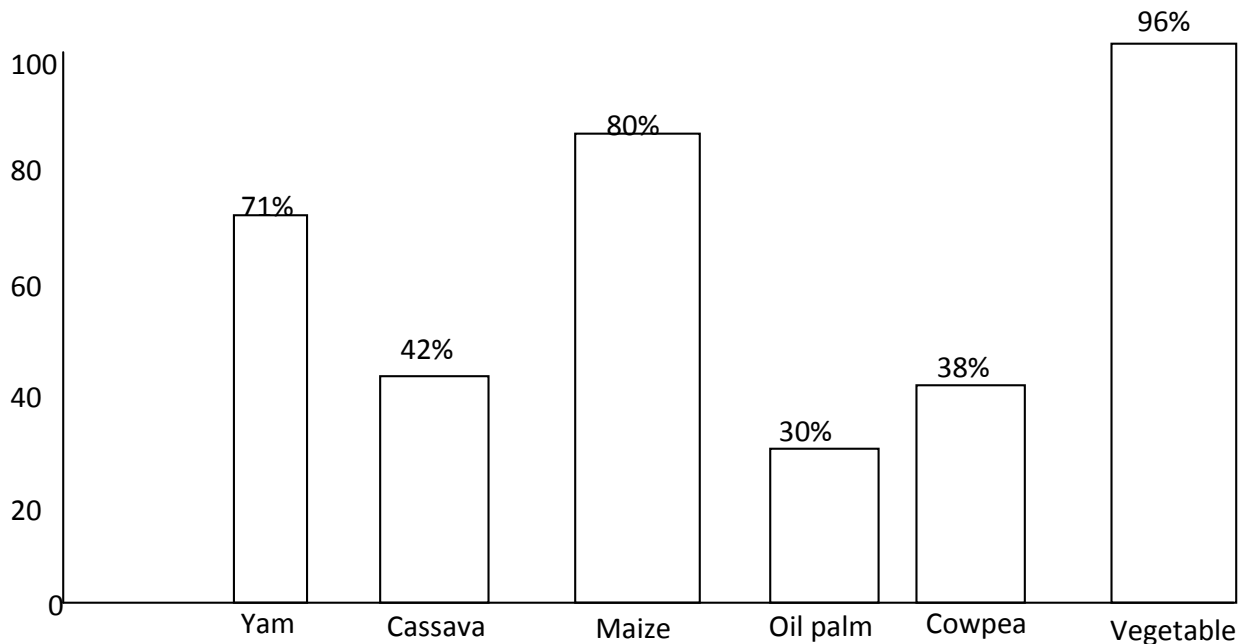
<b>Variable</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Mean</b>
<b>Gender</b>			
Male	16	5.00	
Female	114	95.00	
<b>Age (years)</b>			
Less than 30	16	13.33	
31-40	60	50.00	
41-50	36	30.00	
51-60	8	6.67	39.1
<b>Marital status</b>			
Single	28	23.33	
Married	86	71.67	
Widow	4	3.33	
Widower	2	1.67	
<b>Level of education</b>			
No formal education	37	30.83	
Primary education	60	50.00	
Secondary education	21	17.50	
Tertiary education	2	1.67	
<b>Household size</b>			
1-5	48	40.00	
6-10	64	53.33	
11-15	8	6.67	6
<b>Farming experience</b>			
< 10			
Less than 10	12	10.00	
10-19	66	55.00	
20 and above	42	35.00	16
<b>Source of labour</b>			
Hired labour	32	26.67	
Family labour	82	68.33	
Group labour	6	5	

Source: Field survey, 2016.

communities in the area that cocoyam production is an enterprise meant especially for women; and corroborates Okoye, Onyenweaku and Asumugha (2007) that small-scale farmers, especially women, who operate within the subsistence economy grow most of the cocoyam in Nigeria.

Furthermore, majority (80.00%) of the respondents were within the age range of 31-60 years. The mean age of the respondents was 39.1 years. This result implied that the respondents were in their active productive age, and an advantage for improvement in the farmers' productivity if better production strategies were available. Onwubuya and Ajani (2012) reported the participation of farmers in their active age in cocoyam production. The results further indicated that majority (71.67%) of the respondents were married. This is not an indication that the women were less involved in cocoyam production because they are often perceived as subordinates to the males in male-headed households (Fakoya, Apantaku and Adereti, 2006).

On educational attainment of the respondents, majority (69.17%) attained one form of formal education or another. This implied that most of the respondents were literate enough to adopt improved cocoyam production strategies to increase their productivity and output if they were made available. Furthermore, about 53.33% of the respondents had a household size of 6-10 persons with a mean household size of 6 persons. A large household size is an added advantage for the availability of cheap labour where most of the family members live in the farming communities (Obiekwe and Ugwumba, 2016).



**Figure 1.** Percentage distribution of respondents by crops intercropped with cocoyam.

On farming experience, 55% of the respondents had 10-19 years. The mean farming experience was approximately 16 years. This implied that the respondents were experienced cocoyam producers who could grab any opportunity that would help them increase their productive potentials. Majority (68.33%) of the respondents depended on communal labour for their production activities. The use of family labour can reduce cost of production and increase profit (Fakoya *et al.*, 2006).

### **Cocoyam cropping system**

The information in Figure 1 showed the various crops interplanted with cocoyam in the area. Majority (96%) of the combinations were cocoyam interplanted with vegetables such as tomatoes, pepper, okra and other vegetables. Amusa *et al.* (2011) observed that most farmers diversify production through intercropping because of the risks and uncertainties involved in agricultural production. This was closely followed by cocoyam-maize interplant (80%), cocoyam-yam interplant (71%), cocoyam-cassava (42%), cocoyam-cowpea (38%) and the least, cocoyam-oil palm (30%). The cocoyam-oil palm interplant was the least probably because shading of the farm by palm fronds would definitely retard the yield of cocoyam.

### **Constraints to effective production of cocoyam**

The constraints to effective production of cocoyam by the respondents are shown in Table 2. The major constraining factors as indicated by the respondents included high cost of hired labour (M = 3.9), Scarcity of fund (M = 3.9), high incidence of pests and disease (M=3.8), low soil fertility (M=3.7), inadequate extension services (M=3.6) and unavailability of organic fertilizer (M=3.5). It could be inferred generally from table 2 that most of the factors had links with scarcity of fund and high cost of agricultural inputs. Credit plays a vital role in the economic development of a nation. It is a crucial input required by smallholder farmers to establish and expand farm enterprises with the aim of increasing household income (Idoge, 2013). This also corroborates Amusa *et al.* (2011) that high cost of farm inputs, hired labour, inadequate extension contacts and poor soil fertility are some of the major challenges facing most African farmers. Other problems, though weak ones, militating against the production of cocoyam were; high cost of inorganic fertilizer (M=3.4), unavailability of agro-chemicals (M=3.3), weed problem (M=3.2), scarcity of improved varieties (M=2.4), poor access to good roads (M=2.2), climate change (M=2.1), scarcity of technical know-how (M=1.5) and poor product price (M=1.2).

**Table 2.** Constraints to cocoyam production in the area

<b>Constraint</b>	<b>Mean score(M)</b>	<b>Rank</b>
High cost of hired labour	3.9	1 <sup>st</sup>
Insufficient fund	3.9	1 <sup>st</sup>
High incidence of pests and diseases	3.8	3 <sup>rd</sup>
Low soil fertility	3.7	4 <sup>th</sup>
Inadequate extension services	3.6	5 <sup>th</sup>
Unavailability of organic fertilizer	3.5	6 <sup>th</sup>
High cost of inorganic fertilizer	3.4	7 <sup>th</sup>
Unavailability of agro-chemicals	3.3	8 <sup>th</sup>
Weed problem	3.2	9 <sup>th</sup>
Scarcity of improved varieties	2.4	10 <sup>th</sup>
Poor access to good roads	2.2	11 <sup>th</sup>
Climate change	2.1	12 <sup>th</sup>
Scarcity of technical know-how	1.5	13 <sup>th</sup>
Poor product price	1.2	14 <sup>th</sup>

Source: Field survey, 2016.

**Table 3.** Identified strategies for improving the production of cocoyam

<b>Strategy</b>	<b>Mean score (M)</b>	<b>Rank</b>
Provision of adequate credit facilities	2.9	1 <sup>st</sup>
Formation of farmers cooperative societies	2.8	2 <sup>nd</sup>
Regular visit by extension agents	2.7	3 <sup>rd</sup>
Use of resistant varieties	2.6	4 <sup>th</sup>
Encouraging farmers programme in agriculture	2.5	5 <sup>th</sup>
Subsidizing agricultural inputs	2.4	6 <sup>th</sup>
Provision of farm machineries	2.4	6 <sup>th</sup>
Regular weeding of farm	2.2	8 <sup>th</sup>
Use of recommended spacing	2.1	9 <sup>th</sup>
Availability of improved varieties	2.0	10 <sup>th</sup>
Availability of market	1.3	11 <sup>th</sup>

Source: Field survey, 2016.

### Strategies for improving cocoyam production

Table 3 highlights the identified strategies for improving cocoyam production in the study area. The strategies arranged in descending order of importance included the provision of credit facilities (M=2.9), formation of cooperative society (M=2.8), regular visit by extension agents (M=2.7), use of resistant varieties (M=2.6), encouraging farmers' programme in agriculture (M=2.5), subsidizing agricultural inputs (M=2.4), provision of farm machineries (M=2.4), regular weeding of the farm (M=2.2), use of recommended spacing (M=2.1), availability of improved varieties (M=2.0), and availability of market M=1.3). Nenna (2011) stated that extension services bear great potentials for improving the productivity of farmers, and promoting the right attitude among the natural resources managers.

### CONCLUSION AND RECOMMENDATIONS

Cocoyam is an important diet to many households in the study area. The farmers involved in the production of cocoyam were mostly literate, married with large household size and experienced. The farmers interplanted cocoyam with other crops as insurance against crop failure, and due to production constraints such as high cost of labour, scarcity of fund, high incidence of pests and diseases, low soil fertility, inadequate extension services among others.

Considering the benefits of cocoyam to humanity, urgent attention should be given to the mitigation of the identified problems faced by the farmers through the provision of adequate credit facilities, subsidization of production inputs, expansion of extension services to encourage fast adoption of better production strategies, increased productivity and income..

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