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Cocoyam Emerging as a Cash Crop in Anambra East LGA of Anambra State, Nigeria

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Abstract
The survey was conducted to collect baseline data for the cocoyam multiplication and distribution campaign conducted by the National Root Crops Research Institute, Igbariam Sub-station, Anambra State, Nigeria. After the multiplication of the cocoyam experiment in the Igbariam sub-station. A total of 45 farmers and 60 traders were interviewed throughout May-September, 2022. In the three (3) sample areas of Igbariam, Nnado and Otuocha. In addition to contributing much to the food staple base in the households, cocoyam was found to be playing an increasingly important role as a cash earner not only in the household but also a cash earner in the rural economy of Otuocha, Nnnodo and Igbariam communities which have good access to urban consumer markets through a good network of roads. Farmers in these areas have pioneered the introduction and management of a high-yielding and palatable variety called ede ofe. Driven by an apparent increase in demand in urban areas, a good marketing system dependent on motor transport has been developed. Farmers seem to have reached a point of self-sufficiency as far as home consumption of cocoyam is concerned. Farmers are being encouraged to diversify utilization and processing to maintain demand and cash.
Keywords: Ede-ofe, Ede-uhie, household and cocoyam farmer

Introduction

Cocoyam (*Colocasia esculenta* (L) Schott) is a herb that belongs to the family Araceae and is commonly referred to as taro (Dutta, 1990). It is a tuber crop cultivated mainly for its edible corms, though the leaves, petioles and flowers are used in soup preparation (Eze and Maduewesi, 1990). The corms and cormels can be boiled or baked and consumed in different forms such as soup thickener, pounded fufu, roasted in fire, porridge and biscuit (Ajala and Obiechina, 1987). They are rated third after yam and cassava among the staple tuber crops eaten in Nigeria (Onwueme, 1998). The young leaves are spinach-like and nutritious, providing a lot of minerals, vitamins and thiamine. It is particularly a major vegetable and source of income for farming households in Ghana. Cocoyam is an important food crop across many countries in sub-Saharan Africa, particularly in Nigeria, Ghana and Cameroon. It provides a cheaper yam substitute, especially during periods of food scarcity. Nutritionally, cocoyam is rich in carbohydrates with a nutritional value comparable to potato (Wang, 1983) and superior to cassava and yam in protein, mineral and vitamins contents as well as easily digestible starch (Parkinson, 1984; Onyeka, 2014). Cocoyam also contains a higher appreciable amount of essential minerals (Ca, Mg and P) than cassava and yam. It is highly recommended for diabetic patients, the aged, children with allergies and persons with intestinal disorders (Plucknett, 1970). Nigeria is the largest producer of the crop in the world and accounts for about 37% of the total world output of cocoyam (FAO, 2015). The production of this important crop has been hampered by the attack of taro leaf blight caused by *Phytophthora colocasiğe.*

Phytophthora colocasiğe is the most destructive disease of *colocasia* causing 25-90% loss in yield of cocoyam. Besides, the pathogen also causes serious post-harvest decay of corms and cormels in storage. The origin of the pathogen is still unknown (Shekhar *et al*., 2006) and it is reported to survive inside the tubers during the off-season. Talwana *et al*. (2009); recorded that taro leaf blight has extended to West African countries, especially Nigeria, Cameroon and Ghana. Some authors have demonstrated the enhancement of soil suppressiveness by both composted and un-composted organic amendments (Aryantha *et al*., 2000). Several works have stated that composted materials are more suppressive to root rots than uncomposted ones (Hoitink and Boehm, 1999; Snapp *et al*., 2016). Malandraki *et al*. (2008) and Tamm *et al*. (2010) have consistently demonstrated suppressive effect of composted amendments on soil-borne diseases, such as damping-off and root rots caused by *Pythium ultimum, Rhizoctonia solani, Rosellinia necatrix, Phytophthora* spp and wilts caused by *Fusarium Oxysporum* and

Verticillium dahlia in a wide range of crops. Chukwu *et al*. (2011) recommended the application of 5 t/ha RMW + 4 t/ha PM + 4000 kg /ha NPK for the control of CRRBC, increased yields of NXs 001 and improved soil health. Soil-borne diseases are the second most important limiting factor on crop yield after water insufficiency. *Xanthosoma* spp production systems in particular are plagued by many intractable soil-borne diseases, like cocoyam root rot blight complex (CRRBC). The name CRRBC, according to Chukwu *et al*. (2011) arose out of conflicting research investigations on its aetiology, where various causal organisms were implicated, such as *Sclerotium rolfsii* (Arene and Okpala, 1981), *Pythium myriotylium, Rhizoctonia stolonifer* (Okeke, 1981), *Fusarium solani* and *Phytophthora infestans* (Arene and Okpala, 198l). Arene and Ofoegbu (1984) also identified *Pythium* spp, *Fusarium* and *Rhizoctonia solani* in CRRBC of Xanthosoma spp. Infected plants become chlorotic and weak which affects crop growth, vigour, tuber quality and harvestable yields of *Xanthosoma*. Chukwu *et al*. (2011) reported that previous efforts to tackle the disease through the use of high potassium (K) fertilizer (Nnoke *et al*., 1987), time of planting (Igbokwe, 1981) and intercropping (Odurukwe and Enyinnaya, 1987) were not effective. The management of CRRBC has often resulted in the use of soil fumigants, which have the potential to be detrimental to beneficial soil-borne organisms.

Methodology

Study Area

The study was conducted in Anambra East LGA of Anambra state. Three communities were purposively selected to represent the different levels of commercialization of cocoyam sales. Igbariam community in Anambra East LGA is a relatively commercialized community. It is traversed by a tarred road linking Achalla, Nnado to Omoh communities. Nnado community, with increasing cocoyam production and trade is traversed linking Onitsha-Enugu expressway to Omor branching to Igbariam community and Chukwuemeka Odumegwu University Igbariam. Otuocha community is the relatively urban centre and headquarters of Anambra East LGA. The roads transverse through Otuocha linking the new Anambra International Airport, Igbariam, Nnado to Omor Onitsha Enugu Expressway. The rainfall pattern in this area is from early March – April, and November to March for the dry season period.

Farmer's Interview

Communities were sampled from registers kept by ADP extension officers. In each ward, a list of all adults involved in cocoyam farming was drawn up and 20 farmers were randomly selected for interviews. The farmers were monitored every fourth night, over six months. A questionnaire covering social features and agronomic practices was used. Harvests, sales, buyers, the amount bought and prices were monitored for each farmer by the fourth-night visit. Containers were used in the harvest and sales were calibrated by weighing. Areas cultivated by each farmer were measured. Yield estimates were made, by counting several mounds and sampling them. At each visit, a 24-hour dietary recall for the household was compiled with the farmers' prices, which were recorded every 2 weeks by purchasing and weighing the produce at one or two major roadside markets in each community.

Traders Interview

Out of all subjects from these communities that were identified during the survey, 52 were willing to be interviewed. The interviews were done every two weeks in the three communities using a structured questionnaire.

Results and Discussion

Results from Table 1 show that 9.2% of respondents were within the age range of 20 – 29 years while 44% were within the range of 30 – 39 years. The range of 40 – 49 years accounted for 32.4%; those within 50 – 59 years accounted for 11.7% while those above 60 years accounted for 2.7%. This indicates that young people of economically active age dominated in the study area. Moreso, young farmers may be interested in acquiring new ideas to improve their environment. Table 1 further indicated that 44.4% of the respondents are male while the female accounted for 55.6%. This implies that the sex distribution of the cocoyam farmers skewed toward female respondents. Table 1 shows that 40% of the respondents completed primary school education, 31.2% completed secondary school education, 24.4% completed ND/NCE education and 4.4% completed HND/University education. The high level of literate people among the cocoyam farmers indicates that the majority of them are in a better position to adopt new technologies exposed to them. Results from Table 1 show that 71.2% of the respondents are married, while 13.3% are single. Similarly, 2.2% divorced and 13.3% widowed. The high number of married respondents could increase the number of family labourers for farm activities. About 44.4% of the respondents had less than 5 persons in their household. Those with 5 – 10 persons accounted for 44.4% while those between 11 – 15 persons accounted for 13.2%. This means that the farmers had relatively large-sized households and this may allow them to farm more hectarage of land. Table 1 further indicates the varieties of cocoyam grown in the study area. Ede ofe accounted for 53.3%, followed by Ede uhie 26.7%, Coco india 11.1% Ghana, 6.7% and others 2.2%. The majority of farmers planting Ede ofe may be attributed to its qualities of higher yield, easily marketable and good looking. Data from Table 1 further indicated that 100% of the cocoyam farmers planted less than 1ha of land. This indicates that cocoyam farmers in these communities are still under small-scale farming. Table 1 further shows that a greater proportion (46.7%) of the respondents are full-time farmers, 28.9% are in farming and trading activities, 13.3% are civil servants, 6.7% are pensioners and 4.4% are involved in other activities. The majority (64.4%) belong to farmers' groups/cooperatives, especially marketing cooperatives. While 35.6% of the respondents were not members of any farmers' groups/cooperatives. Being a member of a farmer's group/cooperative could be

advantageous to farmers because farmers' social organizations offer an effective channel for extension contact as well as other opportunities for new technologies.

Cocoyam production

Results from Table 2 show the percentage of farmers cultivating different varieties of cocoyam. Table 2 further indicated that 100% of farmers in Igbariam planted Ede-ofe, followed by Nnado 72% and Otuocha 60%. Ede-uhie is majority planted by Nnado farmers while 37% of Nnado planted coco india, followed by Otuocha 32%, and Igbariam 17%. Furthermore, 39% of Otuocha farmers planted Ghana, followed by Nnado 28%, of Igbariam did not plant Ghana varieties at all. The production of cocoyam is done by both men and women, though trading and predominantly done by women. The traders buy the produce, especially Ede Ofe from farmers in the three communities and resell it in the urban areas of Onitsha, Nnewi, Awka and beyond. The production practices are still labour-intensive with minimum use of purchased inputs. Farmers in the communities with high sales have decided to increase their hectarage next farming season. They are also looking for ways to preserve and have them all year round. A wide range of cocoyam varieties were mentioned in the study. Ede ofe was the preferred variety in the areas growing cocoyam mostly for sale, particularly the areas along the major markets and roads. The Ede ofe and Ede Uhie varieties are associated with the commercialized areas because of their good organoleptic qualities, attractive colour and high yield.

Results from Table 3 indicate the average plot size per hectare planted in each community with cocoyam. From Table 3 it indicates that the plot size of cocoyam planted by the farmers shows that they are still small-scale farmers.

Cocoyam's contribution to the diet

Cocoyam was the principle component in the diet of the sampled farmers in the survey period, 2022. In Igbariam, cocoyam made up 59% of the meals especially during the lean period, in Nnado is 63% while in Otuocha is 48% of the meals. It was particularly important during morning meals where it is roasted or boiled as breakfast, it was reported by over 70% of the farmers in the three communities.

Cocoyam marketing

Data from Table 5 in Igbariam, Nnado and Otuocha show their different production output, 15,014 kg, 6322kg and 5,850 kg were harvested. From Table 5, 14,466kg, 5889kg and 3060kg were sold respectively by the communities. Percentages for Igbariam, Nnado and Otuocha were 96%, 84% and 52% respectively.

Possible income from cocoyam

The result from Table 6 shows a farm budget was used to estimate net return from cocoyam in comparison with other common cash crops in Igbariam, where trade is well established. Net return (income is the value of the total produce harvested after subtracting all the costs incurred during production and marketing of the produce at the field price. Cocoyam is an attractive cash crop because of its low input requirement, the main input is labour for clearing land and making mounds. Labour is happily supplied by family members. Cocoyam is a high-value crop with attractive returns to labour but its yields are low and unreliable due to root rot. Maize has the lowest return to labour because of high input requirements but is a good family food security crop.

Conclusion

In conclusion, cocoyam was found to be a principle component in the diet of the farmer households during the survey period. It was more important for morning meals (breakfast) for over 70% of the sampled farmers. Cocoyam was found to be a very important cash crop in areas with a good road network and transport systems. It has an attractive return on farm labour due to its low input requirements and contributes much to the rural economy. Main production constraints are pests and diseases, shortage of planting materials for Ede Ofe was reported in some areas. Calculations on; Labour, Cost of Planting materials, Fertilizer, and Average selling price./kg were based on the estimates from the field surveys 2022 as given by the farmers and agronomic experience.

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Table 1: Socio-economics characteristics of farmers

Variables	Freq	(%)
Age		
20 – 29	4	9.2
30 – 39	20	44
40 – 49	15	32.4
50 – 59	5	11.7
60 and above	1	2.7
Sex		
Male	20	44.4
Female	25	55.6
Education		
Primary school	18	40
Secondary school	14	31.2
ND/NCE	11	24.4
HND/University	2	4.4
Marital status		
Married	32	71.2
Single	6	13.3
Divorced	1	2.2
Widowed	6	13.3
Household size		
Less than 5 person	20	44.4
5 – 10	20	44.4
11 – 15	6	13.2
Varieties of cocoyam grown		
Ede ofe	24	53.3
Ede uhie	12	26.7
Coco india	5	11.1
Ghana	3	6.7
Others	1	2.2
Farm size		
< 1ha	45	100
1 – 5 ha	0	0
6 – 10	0	0
10 and above	0	0
Occupation		
Full-time farmer	21	46.7
Trading/farming	13	28.9
Civil servant	6	13.3
Pensioner	3	6.7
Others	2	4.4
Membership of social		
Yes	29	64.4
No	16	35.6

Table 2: Percentage of farmers cultivating varieties of cocoyam reported in the communities

Variety	Igbariam (n=20)	Nnado (n=16)	Otuocha (n=14)
Ede ofe	100	72	60
Ede uhie	0	46	0
Coco india	17	37	32
Ghana	0	28	37
Others	0	22	31

Source: Survey, 2022

Table 3: Average plot size under cocoyam cultivation by the sample farmers in the three communities.

Community (n=)	% Fields intercropped	Plot size (ha)	S.D	CV%
Igbariam (20)	80	0.64	0.360	56
Nnado (16)	100	0.3	0.300	25
Otuocha (14)	0	0.07	0.037	54

Source: Survey, 2022

Table 4: Percentage contribution of cocoyam to diet in the three communities.

Community	% contribution	Mean (%)
Igbarian	59	
Nnado	63	56.7
Otuocha	48	

Table 5: Estimated volume of cocoyam harvested and sold by the farmers sampled in each community during the survey (2022)

	Igbariam n = (20)	Nnado n = (16)	Otuocha n = (14)
Harvested (kg)	15,014	6322	5850
Marketed (kg)	14,466	5,889	3060
% of harvested	96	84	52
Balance (kg)	548	433	2,790
% of harvest	4	16	48
Price (₦/kg)	800	860	840
Average yield (kg/ha)	8329	8530	6972
Average area (ha)	0.64	0.30	0.07

Source: Survey, 2022

Table 6: Estimated farm budget for common cash crops in Igbariam, 2022

	Cocoyam	Maize	S/Potato
Gross Income			
Average yield (kg/ha)	8840	3000	7120
Average price (₦/kg)	950	1050	780
Total Gross Income (₦/ha)	8,398,000	3,150,000	5,553,600
Input Costs			
Planting materials (₦/ha)	2,400,000	1,115,000	2,200,000
Fertilizer 3 bags of NPK 20:10:10	90,000(3 bags)	240,000(8 bags)	240,000(8 bags)
Hired labour (clearing)	48,000	48,000	48,000
Hired labour (₦/ha)(mounds)	60,000	60,000	60,000
Family labour ((Planting, weeding) (₦/ha)	62,000	60,000	68,000
Total cost per Ha	2,660,000	1,523,000	2416,000
Net Income = Gross Income	839,8000	3,150,000	5,553,600
-Input Costs	2,660,000	-1,523,000	2,416,000
Net Income	5,738,600	1,627,000	3,137,600

Source: Survey, 2022