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Cocoyam Utilisation Pattern among Rural Households in Ekiti State, Nigeria

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Azeez, Kaothar Kayode¹, Dolapo, Tawakalitu Abiola², Adefalu, Lateef Lawal³

Aderinoye-Abdulwahab, Sidiqat Adeyemi⁴, Olowoyo, A. Victoria⁵

Department of Agricultural Extension and Rural Development,

University of Ilorin, Ilorin, Nigeria.

E-mail: azeez.kk@unilorin.edu.ng¹

Phone no: +2347036103195¹

<https://orcid.org/0000-0001-9571-5575>

E-mail: dolapo.ta@unilorin.edu.ng²

Phone no: +2348060161228²

<https://orcid.org/0000-0003-3739-1079>

E-mail: adefalu.ll@unilorin.edu.ng³

Phone no: +2348063468477³

<https://orcid.org/0000-0003-3599-7683>

E-mail: aderinoye.as@unilorin.edu.ng⁴

Phone no: +2348033594496⁴

<https://orcid.org/0000-0003-3850-2850>⁴

E-mail: adefalu.ll@unilorin.edu.ng⁵

Phone no: +2348052963074⁵

¹Corresponding Author's

Abstract

This study assessed the cocoyam utilisation pattern among rural households in Ekiti State, Nigeria. A multi-stage sampling procedure was used in the selection of 160 respondents. Data were obtained using an interview schedule on sources of information used by the households, the pattern of cocoyam utilisation, respondents' perception towards cocoyam utilisation and constraints to the utilisation. The Data obtained were analysed using mean scores, standard deviation, frequency and percentages. The results showed that family and friends were the main sources of information (66.3%) utilised by the respondents. Also, direct consumption of the cocoyam tubers ($\bar{x}=3.78\pm 3.27$) and use for the treatment of snake bites ($\bar{x}=2.45\pm 2.05$), and treatment of yellow eye ($\bar{x}=1.96 \pm 1.57$) were the major areas of utilisation either as food/recipe or medicinal pattern. Inadequate infrastructural facility ($\bar{x}=2.45$) was considered as the main constraint to the utilisation of the cocoyam. It is therefore concluded that cocoyam is mainly consumed directly in the study area despite respondents' awareness and perception on the cocoyam value. The study thus recommends that farmers should be trained by extension institutions on the utilisation of the crop for other economic benefits.

Keywords: Cocoyam, utilisation, constraints

Introduction

Agriculture's contribution to Nigeria's food security and economic development cannot be overstated. The sector creates employment opportunities, fosters food availability and eliminates poverty among Nigeria's populace (Omodero, 2021). However, there has been a decline in its contribution to the country's economic growth in recent years. The reduction in food production and over-cultivation of limited crops in many areas of the country has led to the need for crop diversification and cultivation of improved plant varieties.

One of the significant crops that needs production intensification is cocoyam. It is an herbaceous monocotyledonous plant that grows to a height of 1 – 2m and it is primarily cultivated for its starchy corm and underground stem. Cocoyam is highly valued for its nutritive and culinary properties. According to Otekunrin et al. (2021), it is believed to have originated in Southeast Asia and subsequently spread to other regions of the world. There are two highly cultivated species of cocoyam in Sub-Saharan Africa which are: *Colocasia esculenta*, also known as 'taro', and *Xanthosomas agittifolium*, also known as 'tannia'. Both belong to the *Araceae* family. It is an important staple food or crop with enormous economic benefits throughout developing countries across Africa, Asia and the Pacific (Amadi et al., 2023). Small-scale farmers with limited resources are the main cocoyam producers in numerous African countries. It greatly supports the sustenance and livelihood of rural farmers, who often consume it for their daily dietary requirements (Mukaila et al., 2022; Amadi et al., 2023).

In Nigeria, women do play active roles in the cultivation of cocoyam throughout the country. Their roles involve planting and other operational requirements for crop cultivation. Additionally, cocoyam is inter-planted with crops such as banana, oil palm, coconut, yam, and other vegetables. Cocoyam thrives well in varying weather conditions. It can grow in warm weather and it is cultivated in tropical and subtropical zones. More so, some species of cocoyam can be grown and adapted to waterlogged areas, and some others thrive well in well-drained soils. It tolerates a certain degree of stress, shade, drought and dry soils (Adiele, 2023).

Nigeria is the world's leading producer of cocoyam, accounting for over two million tonnes (27.14%) of the total world production which was 10.54 million tonnes in 2019. Cameroon and China (mainland) follow as the second and third largest producers respectively (Food and Agricultural Organisation Statistics [FAOSTAT], 2021). Cocoyam is ranked third among the most important root and tuber crops cultivated and consumed in African countries, after cassava and yam (Otekunrin et al., 2021). The production is mostly consumed locally. However, despite being the world's leading producer of cocoyam, no African country is among the top 20 exporters of the crop (Otekunrin et al., 2021).

Although there have been noticeable increases in cocoyam output in African countries, these have mainly been due to increases in cultivated areas rather than yield per land area. This can lead to an unsustainable practice of increased land use for cocoyam cultivation. Additionally, the yield performance of cocoyam in Nigeria is relatively low compared to other countries. Currently, cocoyam yields in Nigeria range from 5 to 7.6 T/ha, while in China it ranges from 17.5 to 19 T/ha. Egypt's yield is estimated to be between 23.5 T/ha and 35 T/ha (Otekunrin et al., 2021).

Despite the significant roles of cocoyam in contributing to the income and food security of rural populations, its nutritional value as well as being a food and cash crop, it receives less research attention compared to other tuber and root crops such as cassava, potatoes, and yam. Therefore, the crop remains an unexploited and poorly understood crop. Otekunrin et al. (2021) suggested that the crop is underutilised in many areas, sequel to the lack of information and documentation on the usage patterns of cocoyam among rural households, this work aims to bridge this knowledge gap.

Objectives of the study

The general objective of this study was to assess cocoyam utilisation pattern among rural households in Ekiti State, Nigeria, while the specific objectives were to:

1. identify sources of information used by the cocoyam farmers in the study area;
2. ascertain the pattern of cocoyam utilisation;
3. examine the respondents' perception towards cocoyam utilisation;
4. identify constraints to utilisation of cocoyam in the study area.

Methodology

This study was carried out in Ekiti State, Nigeria. The State is located in the rainforest zone of Nigeria and lies between latitude 7°40'N – 5°15'E and longitude 7.667°N – 5.250°E with a land area of 6,353 km². The projected population of the State in 2017 was 3,270,798 (National Bureau of Statistics, 2017). Multi-stage sampling procedure was used to select respondents for the study. The first stage involved a purposive selection of two local government areas in the State. The second stage involved a purposive selection of five communities from the selected local government areas where cocoyam was planted. The third stage involved random selection of 16 households from the selected communities from the enlisted households. In all, 160 households were selected. The data were analysed using frequency, percentage, and mean.

Respondents' sources of information on cocoyam utilisation were captured with seven (7) possible sources with responses of yes = 1 and no = 0. The frequency and percentage of information sources utilised by the respondents were computed in descending order. Possible patterns (food/recipe and medicinal) of cocoyam uses were identified and computed using response options of always used (4), often used (3), rarely used (2) and never used (1). The mean score and standard deviation were computed and presented in descending order. Perception of respondents to cocoyam utilisation was measured from a list of eleven (11) statements; using a 5-point Likert-type scale with response options of Strongly Agree (5), Agreed (4), Undecided (3), Disagreed (2) and Strongly Disagreed (1). The mean score and standard deviation were computed. Also, seventeen (17) possible constraints faced in the utilisation of cocoyam were estimated with a possible response of very severe (3), severe (2) and Not severe (1). Mean score and standard deviation were estimated and used to assign positions to the constraints based on their score.

Results and Discussion

Sources of Information on Cocoyam Utilisation

Table 1 reveals that respondents' main source of information on cocoyam utilisation was family and friends (66.3%). This may be due to the proximity and availability of this source. This is followed by radio (65.0%), this could be attributed to the fact that radio is affordable and the majority of the respondents had access to it directly or indirectly. 64.4% of the respondents claimed that they had heard about cocoyam use from neighbours. However, print media was not regarded as part of the major sources of information on cocoyam utilisation (39.4%). This may be due to the fact that print media does not adequately report agricultural issues in Nigeria as noted by Arigbo et al. (2023) and Ogunlade et al. (2020). This result agreed with the findings of Nkeme et al. (2021) where it was observed that the majority of cocoyam farmers obtained

information from friends, family and/or relatives and little or no information from extension agents, television and newspapers.

Table 1: Source of information on cocoyam utilisation.

Sources of Information	Percentage (n=160)
Family and Friends	66.3
Radio	65.0
Neighbour	64.4
Social Media	62.5
Television	56.3
Extension Agents	51.3
Print Media	39.4

Multiple responses

Pattern of cocoyam utilisation

Food/recipe

Table 2 reveals the two categories of cocoyam utilisation– food/recipe and medicinal uses. Direct consumption of cocoyam (\bar{x} =3.78) was regarded as the main use of cocoyam among the respondents. This is followed by cocoyam porridge (\bar{x} =3.51). This indicated that cocoyam is consumed in the study area. The majority of rural residents consume cocoyam either directly or processed and pounded with yam as pounded yam, popularly referred to as *Iyan*. However, cocoyam was rarely used for *fufu* (\bar{x} =2.59) and diced rice (\bar{x} =2.27). This may be because cassava is preferred for making *fufu* in the study area. The result further showed that diced tuber (rice *Ekiti*) was no longer used as rice in the study area. According to Adeyanjue et al. (2019), cocoyam tubers can be processed into more stable food to prolong the shelf-life and transform into consumable products which may include poi, flour, cereal base, chips, slices sun-dried, and flake among others.

Medicinal use

The Table further presents the medicinal usage which includes – the treatment of snake bites (\bar{x} =2.45), treatment of yellow eye diseases (\bar{x} =1.96). However, uses for the treatment of liver diseases (\bar{x} =1.96) and urinary tract infection (\bar{x} =1.96) was not widely practised among the respondents.

Table 2: Pattern of cocoyam utilisation

Activities	Mean \bar{x}	Standard Deviation
Food/Recipe		
Direct consumption of tubers	3.78	3.27
Cocoyam porridge	3.51	3.07
Peel as feeds for ruminants	3.26	2.84
Fried cocoyam chips	3.19	2.78
Leaves for soup and sources	3.08	2.66
Cocoyam flour (<i>Elebo</i>)	3.04	2.63
Cocoyam converted to <i>fufu</i>	2.59	2.30
Diced tuber (rice Ekiti)	2.27	1.96
Medicinal uses		
Treatment of snake bite	2.45	2.05
Treatment of yellow eyes diseases	1.96	1.57
Anti-poison properties	1.95	1.52
Purple camels for pain relieve	1.58	1.08
Treatment of liver diseases	1.46	1.01
Treatment of urinary tract infection	1.46	0.96

Perception of respondent on cocoyam utilisation

Table 3 shows that respondents agreed that cocoyam was rich in nutrients ($\bar{x}=4.77$) which is followed by, helps to generate income ($\bar{x}=4.47$) and its production yield is high ($\bar{x}=4.36$). The results suggested that the vast majority of the respondents had a good perception of cocoyam farming. It has been established that cocoyam contains digestible starch, good quality protein, carbohydrates, vitamin C, minerals, thiamin, riboflavin, niacin and essential amino acids which strengthen the immune system in the fight against diseases. This agreed with the findings of Adeboyejo et al., (2021) who stated that cocoyam could improve the nutritional deficiency among rural households. Also, the result is under the findings of Mukaila et al. (2022) who reported that the impact of cocoyam cannot be over-emphasised based on income generation and source of employment opportunity especially among the rural households. The result further agreed with the findings of Otekunrin et al. (2021), where it was observed that cocoyam is produced in large volume and also ranked as one of the largest tuber crops in the world. Cocoyam helps combat hunger ($\bar{x}=3.99$) due to its availability and relative affordability. Omotesho et al. (2020) stated that cocoyam plays a major role in the lives of many, serving as a food security crop for its availability and affordability among rural households. However, respondents opined that cocoyam cultivation does not require high expertise ($\bar{x}=3.34$).

Table 3: Perception on cocoyam utilisation

Statements	Mean \bar{x}	Standard Deviation
It is rich in nutrients	4.77	4.27
It helps to generate income	4.47	3.99
It's production yield is high	4.36	3.91
Cocoyam helps combat hunger	3.99	3.56
High preference for other tuber crops	3.84	3.47
Lack of knowledge of the use	3.72	3.37
Low awareness of the medicinal value	3.68	3.32
Cultivation requires a high cost of labour	3.47	3.22
Low market value discourage farmers	3.62	3.29
High susceptibility to pests and diseases	3.36	3.10
Cultivation requires high expertise	3.34	3.06

Constraints to utilisation of cocoyam

Table 4 reveals that inadequate infrastructural facilities ($\bar{x}=2.45$) was the most severe constraint mentioned by the respondents, this is followed by inadequate information ($\bar{x}=2.43$) on the utilisation of cocoyam. *Mukaila et. al. (2022)*, reported that due to poor information about cocoyam nutritive values, it is no longer favoured in rural households. Similar observation was made by *Nkeme et al. (2021)* where information was observed to be part of a major constrain to cocoyam production. Also, *Osahon and Ifenkwe (2019)* stated that findings revealed that many of the respondents had low awareness of cocoyam value and uses. Similarly, respondents didn't agree that cocoyam is highly perishable ($\bar{x}=2.14$). The result suggested that respondents believe that if cocoyam is well stored and preserved it stays long. *David-Chukwu et al. (2021)* reported that local farmers preserve cocoyam by sun-drying to reduce the perishable nature of cocoyam.

While scarcity and poor access to fertilizer ($\bar{x}=2.10$), and poor access to land ($\bar{x}= 2.11$) were considered as less constraints. The results suggested that access to land were not seen as problem by the respondents. Likewise, fertiliser was not regarded as a major constraint to the production and utilisation of cocoyam among the vast majority of the respondents. This is in line with the findings of *Nkeme et. al. (2021)* where land tenure and soil fertility were observed not to be part of the major constraint in cocoyam production and marketing. *Mukaila et. al (2022)* noted that challenges faced by cocoyam farmers for cultivation of cocoyam are the high cost of farm inputs and low soil fertility, land and labour constraints, poor access to information, lack of fund and credit facilities and poor government support, lack of improved varieties of cocoyam, poor infrastructural facilities, poor infrastructural capacity and technology knowledge.

Table 4: Constraints to utilisation of cocoyam among rural households

Constraints	Mean \bar{x}	Standard deviation
Inadequate infrastructural facilities	2.46	2.02
Inadequate information	2.43	1.99
Inadequate labour supply	2.34	1.90
Poor government support	2.33	1.90
Seasonal unavailability	2.31	1.86
Low level of demand	2.32	1.88
Poor market value	2.31	1.91
Lack of improved varieties and cultural practices	2.31	1.89
Poor awareness on cocoyam utilisation	2.30	1.86
Poor improved storage technique	2.28	1.86
High cost of production	2.29	1.84
Pests and diseases	2.29	1.90
Susceptibility to physical injury during harvesting and post-harvest operation	2.26	1.85
Low price of cocoyam in the market	2.19	1.76
High perish-ability	2.14	1.75
Poor access to land	2.11	1.70
Scarcity and poor access to fertilizer	2.10	1.71

Conclusion and recommendation

Based on the findings of this study, it is therefore concluded that major rural household utilisation of cocoyam was direct consumption followed by cocoyam porridge. Meanwhile, medicinal usage was mainly for snake bite treatment and yellow eye disease treatment. The extension services should intensify efforts on how to diversify cocoyam utilisation in order to ameliorate the food security challenges being experienced in the country.

References

- Adeboyejo, O. F., Aderibigbe, O. R., & Obarayi, T. M. (2021). Comparative evaluation of instant pouno cocoya (*colocasia esculenta*) produced by flash and cabinet drying. *Journal of food science and technology*, 56 (3), 1482 – 1490.
- Adeyanju, J.A., Babarinde, G. O., Abioye, A.O., Olajire, A.S. & Bolarinwa, I.D. (2019). Cocoyam processing: Food uses and industrial Benefits. *International Journal of Scientific & Engineering Research*. 10(9). 1658 ISSN 2229-5518.
- Adiele, J. G. (2023). Unveiling cocoyam potentials: physiology and agronomy. *Nigerian Agricultural Journal*. 54 (1). :432-440.
- Amadi, C., Mbanaso, E. & Chukwu, G. O. (2023). A revive cocoyam breeding in Nigeria: Achievements, challenges and prospects. Doi:10.4314/NAJ.V43I1.
- Arigbo, P.O., Agwu, E. A., and Adeogun, T. F (2023). Prominence of agricultural information in print media: A content analysis of selected Nigerian Newspapers. *Journal of Agricultural Extension*. Vol 27(2) 80-87. <https://dx.doi.org/10.4314/jae.v27i2.8>
- David-Chukwu, N.P., Aji, R.U., Ndukwe, K. O., Odom, T. C. & Chukwu, M. N. (2021). Production, proximate compositions and dry matters of stored Achicha and Mpoto - Cocoyam based products. *Journal of Food Technology & Nutrition Sciences*. Volume 3(4): 7-7.

- FAOSTAT (2021). Food and Agriculture Organisation of the United Nations Statistical Database; Statistical Division; FAO: Rome, Italy, Available online: <http://www.fao.org/statistics/en/>
- Mukaila, R. Falola, A., Awoyelu, F.E.D., Akanbi, S. O., Chiemela, C.J., Ukwaba, I.C., Ileka, C.M., & Erim, P.A. (2022). Profitability of Cocoyam Production and its Determinants in Cross River State, Nigeria . *Jordan Journal of Agricultural Sciences*. 18 (4) 2022. DOI: <https://doi.org/10.35516/jjas.v18i4.788-279->
- National Bureau of Statistics (2017). Social Statistics Report. <https://nigerianstat.gov.ng/elibrary/read/866>
- Nkeme, K.K., Ekanem, J.T. & Nse, V.A. (2021). Capacity building needs of small-holder cocoyam (*Xanthosoma sagittifolium*) farmers in selected rural communities of Akwa Ibom State, Nigeria. *Journal of Agricultural Extension*. 25(2). 32 – 42. <https://dx.doi.org/10.4314/jae.v25i2>.
- Ogunlade, I.; Olabanji, O. P.; Adebisi, F. A.; Omotesho, K. F (2020). Reporting of Rural Grazing Area Initiative in Selected Daily Newspapers in Nigeria. *Journal of Agricultural Extension Vol. 24 (4):82-90* <https://dx.doi.org/10.4314/jae.v24i4.9>
- Omodero, C.O (2021). Sustainable Agriculture, Food Production and Poverty Lessening in Nigeria. *International Journal of Sustainable Development and Planning*. Vol. 16 (1), pp. 81-87. <http://iieta.org/journals/ijsdp>. <https://doi.org/10.18280/ijsdp.160108>
- Omotesho, K.F., Kayode, A.O., Adebayo, S.A., Akinrinde A.F. & Mohammed, A.J. (2020). Potentials for the commercialization of cocoyam in Oyun local government area, Kwara State, Nigeria. *Journal of Tropical Agriculture, Food, Environment and Extension*. 19 (3). pp. 8 - 14
- Osahon, E.E., & Ifenkwe (2019). Awareness and utilisation of cocoyam value addition technologies by farmers in South-east, Nigeria. *Journal of community and communication research*. 4(2), 127 – 133.
- Otekunrin, O.A., Sawicka, B., Adeyonu, A.G., Otekunrin, O.A. & Racho´n, L. (2021). Cocoyam [*Colocasia esculenta* (L.) Schott]: Exploring the production, health and trade potentials in Sub-Saharan A