



FACTORS INFLUENCING THE ADOPTION OF COCOYAM TUBERS ENTERPRISES AMONG YOUTH IN SOUTH EASTERN NIGERIA

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ABSTRACT

The study examined the factors influencing the adoption of cocoyam enterprise among youth in Southeast Nigeria. Multistage sampling technique was used in selecting 437 respondents. Data were collected using structured questionnaire and analyzed using both descriptive and inferential statistics. The result revealed that majority (66.6% and 66.8%) of the respondents were male and married, respectively. Similarly, 40.0% of the respondents had secondary education with mean age, household size, and farm size of 29.6 years, 3 persons and 1.92 ha, respectively. The result also revealed that majority (60.0%, 54.2%, and 51.0%) of the respondents received information on cocoyam enterprises through extension agents, research officers and radio/television which were ranked 1st, 2nd, and 3rd, respectively. Half (50.1%) of the respondents had high level of adoption of the cocoyam enterprise while 19.2% have a very high level of adoption. The results of regression analysis of factors influencing the adoption of cocoyam enterprise revealed that age ($P < 0.05$), household size ($P < 0.1$), membership of cooperative ($P < 0.01$) and contact with extension agents ($P < 0.05$) significantly influenced the adoption of cocoyam enterprise in the study area. The major constraints to the adoption of cocoyam enterprise in the study area were inadequate access to credit facilities, high cost of inputs, and weed infestation, which were ranked 1st, 2nd, and 3rd, respectively. It was concluded that age, household size, membership of cooperative and contact with extension agents significantly influenced the adoption of cocoyam enterprise in the study area. The study recommended that Government and stakeholders should implement affordable and subsidized loan programmes specifically for young cocoyam farmers, there should be advocacy for land reforms and government-supported land leasing programs is needed to improve young farmers' access to agricultural land and farmers should be encourage to form and join cooperatives in order to enjoy economies of scale.

Keywords: Adoption, Cocoyam, Enterprises, Youth.

INTRODUCTION

Agriculture plays a fundamental role in economic growth, enhancing food security, poverty reduction and rural development. It is the main source of income for about 2.5 billion people in the developing world (Wandji, *et al.*, 2021). Consequently, additional sustainable agricultural enterprise participation remains an important part of the efforts to boost food availability, crop production and improve wellbeing in a bid to reduce food and nutrition insecurity which is currently threatening humans' right to food accessibility in developing countries (Sennuga and Fadiji, 2020). Agriculture is one of the most promising sectors in Sub-Saharan Africa (SSA), with the ability to employ young people and reduce poverty (Menashe-Oren and Stecklov, 2018). The sector can therefore be seen as an essential



driver of economic development and an area of great opportunity for young people. However, agriculture is not appealing to most young people (Babbie, 2016). About 20% of the world's rural youth live in Africa but Africa's share is projected to rise to 37% by 2050 (IFAD, 2019). In the SSA countries, the population involved in agriculture is ageing by a mean of 55 years (Njeru, 2017).

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 (Omotesho *et al.*, 2020). It is a traditional crop and a cultural foodstuff in Nigeria which has great adaptability to varying farming systems, nutritive and commercial food values. The crop is a yam substitute that occupies an inferior food status in the study area. It is mainly cultivated by women and in most cases planted as an intercrop in a previously established farm. It is, therefore, regarded as a lazy man's crop and consequently a poor man's food (Opata *et al.* 2021). Nigeria is currently the world's leading producer of cocoyam (Enibe *et al.*, 2019) accounting for up to 3.4 million metric tonnes annually. Nutritionally, cocoyam is superior to cassava and yam in the possession of higher protein, mineral, vitamin contents and the starch is also more readily digested (Suleiman, 2019). It can be processed into cocoyam flour, can be consumed in various forms when boiled, fried, pounded or roasted and can also be processed into chips which have a longer shelf life (Temidayo *et al.*, 2021). The leaves are used as vegetables in preparing soup in various parts of the world (NRCRI, 2013).

Involvement of youth in Cocoyam enterprises has become a vital approach to revitalizing Cocoyam enterprise among the youth in South east Nigeria. Youth adoption of Cocoyam Enterprise will therefore not only boost the much-needed narrowing gap of demand and supply of Cocoyam in the Nigerian markets, it will also provide employment opportunities for the large idle youths, stem the tide of rural-urban migration and general improve the standard of living in the rural areas. According to Amenta *et al.* (2019), the adoption of Cocoyam enterprise can serve as a mobilization tool through which rural youths can be made productive both to themselves and to their communities. He argues that such rural mobilization could enhance the orientation of the mind of young rural people by promoting positive attitude towards the worth and dignity of labour.

Despite the enormous benefits accruable from Cocoyam enterprise in Southeast Nigeria, the youths have developed a strong apathy, negative perception and attitude towards Cocoyam enterprise in Southwest Nigeria (Afolabi *et al.* 2022). The efforts of successive governments in Nigeria. Nigeria National Root Crop Research Institute (NRCRI) Umudike and International Institute for Tropical Africa (IITA), Ibadan to float several innovations and programmes targeted at encouraging youths' participation in Cocoyam enterprise, has not yielded the desired outcome. It was reported by Nwakor *et al.* (2019) that there are several factors limiting rural youth participation in Cocoyam enterprise. These challenges include economic factors such as limited access to land, low access to credit facilities, low profit margins, lack of initial capital, poor returns to investment, lack of basic farming knowledge, no incentives for farmer, no agricultural insurance, lack of access to tractors and other farm inputs, and limited accessibility of the market. Social factors include low level of education, less contact with extension agents, negative attitude towards agriculture, and parental influence.

In Nigeria, data on rural youth participation in Cocoyam enterprise are scarce, the few studies available focused mainly on the parents of the youths, while the youths who constituted a large proportion of the production force are neglected. There is therefore the need to investigate what has been responsible for this lukewarm attitude of youths toward

Cocoyam enterprise. It is therefore, becomes pertinent to investigate the factors influencing adoption of Cocoyam enterprise in Southeast Nigeria. The specific objectives were to;

- i. describe the socio-economic characteristics of the respondents in the study area;
- ii. examine the sources of information on cocoyam available to the respondents;
- iii. examine the level of adoption of cocoyam tuber;
- iv. determine the factors influencing adoption of Cocoyam enterprise by youths; and
- v. describe the constraints to youth participation in Cocoyam enterprise in the study area;

MATERIALS AND METHODS

The Study Area

The study was conducted in South Eastern States of Nigeria. The zone lies between latitude 5° 91' and 7° 75' N of equator and longitude 6° 85' and 8° 46' East of Greenwich Meridian. It has a total land mass of 10,952.400ha. The area is one of the six geopolitical zones of Nigeria and it comprises of five states, namely; Anambra, Imo, Abia, Enugu, and Ebonyi. The study area has a total population of 16.4 million people who are mainly of Igbo extraction (NPC, 2006). The zone lies within the rainforest and derived savanna region of the country and is bordered in the North by Benue, Kogi States in the West, Delta and Rivers States in the South, Akwa Ibom State and Cross River State in the East. South east states have two major seasons in the year; the rainy season which last from the month of April-October and the dry season that lasts from November to March. The temperature of the area varies between 18°C-34°C. About 60-70 % of the inhabitants engage in agriculture mainly crop farming, cocoyam production inclusive. Other non-agricultural activities engaged by people for sustenance include civil service, petty trading, vulcanizing, driving, carpentry, mechanics and others. The choice of South East Nigeria as the study area is because of the high intensity of cocoyam enterprise in the study area.

Sampling Technique and Sampling Size

Multi-stage sampling technique was used to select the respondents for the study. The first stage was a purposive selection of three states out of the five states in the Zone based on their proximity to the researcher. The selected States were Abia, Anambra, and Imo States. In the 2nd stage, three (3) Local Government Areas (LGAs) were randomly selected making a total of 9 LGAs. In the 3rd stage, one (1) community will be randomly selected from each of the selected LGA making a total of 27 communities. The 4th stage was the random selection of 15 youths from each of the selected communities making a total of 405 respondents drawn from the area for the study. In determining the sample size for the study, Yamani's Statistical formula for determining the sample size from a finite population. The procedure is outlined as follows:

$$n = \frac{N}{1 + N(e)^2} \quad \dots(1)$$

Where:

n = Sample size to be determined

N = Entire population of interest

e = Error margin (0.05)

1 = Constant (unity)

Table 1: Sampling Size Selecting Plan

States	LGAs	Communities	Sample Frame	Sample Size (20%)
Abia State	Isiala Ngwa South	Isi Ala Nvosi	85	17
		Omoba	69	14
		Mbutu	79	16
	Isiala Ngwe North	Abayi	78	16
		Amapu Ngwa	65	13
		Amuzu	70	14
	Ikwuano	Ariam	95	19
		Isingwu	89	18
		Nkwo-egwu	40	8
		Nteje	75	15
Anambra State	Oyi	Umunya	99	20
		Nkwelle-Ezunaka	89	18
		Amorku	90	18
	Ihiala	Lilu	72	14
		Mbosi	70	14
		Uga	80	16
	Agwata	Isuofia	96	19
		Umuona	85	17
		Obudi-Agwa	80	16
	Ohaji/Egbema	Egbema	79	16
		Ohoba	91	18
		Naze	72	14
	Owerri North	Obibi Uratta	85	17
		Orji	102	20
Imo State	Njaba	Amiyi	85	17
		Uba	76	15
		Amakor	88	18
	Total		2,184	437

Source: Field Survey, 2023

Method of Data Collection

The study used both primary and secondary data. Primary Data were collected using structured questionnaire.

Method of Data Analysis

Data collected were analyse using descriptive and inferential statistics. Descriptive statistics such as frequency, percentages and means were used to achieve objectives i, ii and iv. Linear regression analysis was used to achieve iii. The explicit of the model is written as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \dots + \beta_{10} X_{10} + \epsilon \quad \dots(2)$$

Y = Youth level of adoption of cocoyam Enterprise (1= Very high 2= High 3= Moderate 4= Average 5= Low)

X₁ = Age of the rural youth (in years)

X₂ = Gender (male = 1, female=0)

X₃ = Level of education (in years)

X₄ = Marital status (married=1, single=0)

X₅ = Farm size (ha)

- X₆ = House hold size (number)
 X₇ = Experience (in years)
 X₈ = Extension contacts (Yes=1, No=0)
 X₉ = Access to credit (Yes=1, No=0)
 X₁₀ = Membership of cooperative societies (Yes=1, No=0)

RESULTS AND DISCUSSION

Sex, Marital Status and Educational Level of the Respondents

The results in Table 2 reveal that majority (66.6%) of the respondents were male while 33.4% are female. This implies that males are more involved in cocoyam enterprise in Southeast Nigeria. This result is in line with the report of Hunter *et al.* (2017), that male participation in agricultural activities in Nigeria is generally higher than female participation due to cultural norms and gender roles. The results also show that the majority (66.8%) of the respondents were married, while 16.9%, 10.8% and 5.5% were single, divorced, widowed, respectively. This implies that marital status might influence the adoption of the Cocoyam enterprise, as married individuals may have more responsibilities and motivation to engage in agricultural enterprises to support their families. This finding concurs with the study by Akpan *et al.* (2023), which indicated that married individuals are often more involved in farming activities due to their family obligations.

Furthermore, 40.0% of the respondents had secondary education, 27.7% had primary education, while 16.9% had tertiary education. Similarly, 12.8% had non-formal education, and only 2.5% had never being to school. This implies that the respondents in the study area were literate and that education plays a significant role in the adoption of agricultural innovations. Higher educational attainment generally enhances awareness and understanding of new technologies, which can facilitate the adoption process. This result is consistent with the findings of Adebayo *et al.* (2018) that education positively influences the adoption of agricultural technologies.

Table 2: Distribution of Respondents according to Sex, Marital Status and Educational Level (n= 437)

Variable	Frequency	Percentage
Sex		
Male	291	66.6
Female	146	33.4
Marital status		
Single	74	16.9
Married	292	66.8
Divorced	47	10.8
Widowed	24	5.5
Educational level		
Primary education	121	27.7
Secondary education	175	40.0
Tertiary education	74	16.9
Non-formal education	56	12.8
Never being to school	11	2.5

Source: Field Survey, (2024)

Age, Household and Farm Size of the Respondents

The age of the respondents ranges from a minimum of 17 to a maximum of 50 years, with a mean age of approximately 29.6 years and a standard deviation of 7.32. This indicates that the respondents are in their late twenties to early thirties. This relatively young age of the respondents implies a potential for long-term engagement and innovation in cocoyam farming, provided they receive adequate support and resources. The result agreed with the report of Olaniyi and Adeoye (2020), that young adults are increasingly participating in agricultural enterprises due to rising unemployment and the search for sustainable livelihoods.

The household size of the respondents ranges from 1 to 12 persons, with a mean of approximately 3 persons and a standard deviation of 1.93. This indicates that most respondents have repetitively small size households. This concurs with the report of Edeh and Nwosu (2018), that smaller household sizes are common among young farmers, reflecting nuclear family structures and the early stages of family life. The household size can influence labor availability and consumption needs, affecting the overall productivity and adoption of cocoyam enterprise.

The farm size ranges from a minimum of 0.5 hectares to a maximum of 6 hectares, with a mean of approximately 1.92 hectares. This implies that most respondents were small-scale farmers, which is typical of subsistence and smallholder farming in Nigeria. This is consistent with the report by Alabi and Agboola (2019) that small-scale farming is prevalent among young farmers due to limited access to land and capital.

Table 3: Distribution of Respondents according to Age, Household and Farm Size (n= 437)

Variable	Minimum	Maximum	Mean	Std. Deviation
Age (years)	17.00	50.00	29.6	7.32010
Household size (persons)	1.00	12.00	3	1.92627
Farm size (ha)	.50	6.00	1.9	1.02756

Source: Field Survey, (2024)

Sources of Information of the Respondents

The results in Table 4 reveal that the respondents rely on various sources of information for their agricultural activities. The most frequently source is extension agents (60.0%), followed by research officers (54.2%), radio/television (51.0%) and NGOs (51.0%) which were ranked 1st, 2nd, 3rd and 4th, respectively. This implies that formal sources of agricultural information, such as extension agents and research officers, remain highly relevant among youth in the study area. This is in line with the report of Okocha *et al.* (2020) that extension agents play a crucial role in disseminating agricultural knowledge and innovations.

Notably, almost half (48.5%) of respondents used email as a source of information which was ranked 5th, reflecting the growing importance of digital communication. As digital literacy and internet access improve, email and online platforms could become even more significant in the dissemination of agricultural information. This is consistent with the findings of Adekunle and Adewuyi (2021), who noted the increasing role of digital tools in agricultural extension services. The Table also indicates that 42.3% and 39.1% of the respondent's sourced information from friends/relatives and internet ranking 6th and 7th, respectively. This suggests that mass media and interpersonal networks are also important channels for information dissemination. This concurs with the study by Ibrahim and Musa (2019), which highlighted the effectiveness of radio and television in reaching rural farmers.

Utilizing these channels for agricultural education and awareness campaigns could further enhance the adoption of Cocoyam enterprise.

Table 4: Distribution of Respondents according to Sources of Information

Sources of information	Frequency	Percentage	Rank
Extension agents	262	60.0	1 st
Research officers	237	54.2	2 nd
Radio/television	223	51.0	3 rd
NGOs	222	50.8	4 th
Email	212	48.5	5 th
Friends and relatives	185	42.3	6 th
Internet	171	39.1	7 th

Source: Field Survey, (2024)

Respondents' Adoption Level of Cocoyam Enterprise

The result in Table 5 shows that, half (50.1%) of the respondents had high level of adoption of the Cocoyam enterprise, while 19.2% had very high level of adoption. Conversely, 24.3% and 6.4% of the respondents had very low level low level of adoption, respectively. This distribution indicates that most respondents are significantly engaged in Cocoyam farming, with half of them exhibiting a high level of adoption. This finding concurs with the study by Okeke and Anozie (2021), which reported that high adoption levels of agricultural enterprises are often driven by the perceived benefits and profitability of the enterprise. The high level of adoption among the majority of respondents suggests that Cocoyam farming is seen as a viable and beneficial agricultural enterprise. This may be attributed to the efforts of extension services, availability of improved planting materials, and government support through programs like ADP. The lower adoption levels observed among some respondents could be due to factors such as limited access to resources, inadequate training, or socio-economic constraints, as noted by Chukwuma and Eze (2020).

Table 5: Distribution of Respondents according to Level of Adoption of Cocoyam Enterprise (n= 437)

Level of adoption rate	Frequency	Percentage
Very High	84	19.2
High	219	50.1
Very low	106	24.3
Low	28	6.4

Source: Field Survey, (2024)

Factors Influencing the Adoption of Cocoyam Enterprise

The results in Table 6 present the regression analysis of factors influencing the adoption of Cocoyam enterprise among youths in the study area. The adjusted R-squared value of 0.753 indicates that approximately 75.3% of the variation in the adoption of Cocoyam enterprise is explained by the model. The F-statistic of 198.491 is significant at the 1% level, indicating that the overall model is statistically significant.

Age (Coef. = 0.021, p-value = 0.015): The positive and significant coefficient for age at the 5% level suggests that older youths are more likely to adopt Cocoyam enterprise. This might be because older individuals may have more experience and resources to invest in

farming activities. This finding is consistent with the study by Adebayo *et al.* (2018), which found that older farmers are generally more inclined to adopt new agricultural technologies.

Household Size (Coef. = -0.052, p-value = 0.093): The negative coefficient for household size is significant at the 10% level, indicating that larger households may be less likely to adopt Cocoyam enterprise. This could be due to the higher financial and labor demands of larger households, which may limit their capacity to invest in new agricultural ventures. This result aligns with the findings of Oladimeji and Abdulsalam (2019), who reported that larger household sizes often face more constraints in adopting new farming practices.

Membership of Cooperative (Coef. = 0.476, p-value = 0.000): The positive and highly significant coefficient for cooperative membership at the 1% level implies the importance of social networks and collective action in promoting the adoption of Cocoyam enterprise. Being part of a cooperative can provide access to resources, information, and support, which facilitates adoption. This finding concurs with the study by Ogbonna (2018), which emphasized the role of cooperative societies in enhancing agricultural technology adoption.

Contact with Extension (Coef. = 0.284, p-value = 0.014): The positive and significant coefficient for contact with extension agents at the 5% level indicates that frequent interactions with extension services positively influence the adoption of Cocoyam enterprise. Extension services provide vital information, training, and support that can encourage farmers to adopt new practices. This is in line with the findings of Ademola *et al.* (2024), which stressed the importance of extension services in agricultural technology dissemination.

Table 6: Factors Influencing the Adoption of Cocoyam Enterprise

Factors	Coef.	Std. Err.	t-value	p-value
Age	0.021	0.009	2.44	0.015*
Gender	0.107	0.086	1.24	0.215
Marital status	0.064	0.075	0.85	0.395
Household size	-0.052	0.031	-1.68	0.093*
Farm size	.06	0.048	1.25	0.213
Occupation	0.058	0.038	1.53	0.126
Farming experience	0.006	0.017	0.35	0.728
Educational level	0.035	0.044	0.80	0.426
Income level	0	0	-0.83	0.409
Cocoyam enterprise yield	0.002	0.002	0.77	0.444
Membership of cooperative	0.476	0.11	4.31	0.000***
Access to credit	0.076	0.086	0.88	0.377
Contact with extension	0.284	0.115	2.47	0.014**
Constant	2.202	0.328	6.72	0.000**
F -stats	198.491***			
R -squared	0.868			
Adjusted R-squared	0.753			

* = significant at 10%, ** significant at 5%, *** = significant at 1%

Source: Field Survey, (2024)

Constraints to Youth Adoption of Cocoyam Enterprise

The results in Table 7 reveal that inadequate access to credit facilities ($\bar{X} = 3.23$) was the most significant constraint, ranked 1st. Inadequate access to farm land ($\bar{X} = 3.20$) followed as the second-ranked constraint, reflecting the difficulties in preserving harvested cocoyam,

leading to post-harvest losses and reduced profitability. Similarly, high cost of inputs ($\bar{X} = 3.15$) ranked 3rd, implying that market constraints limit farmers' ability to sell their produce efficiently. Other notable constraints included declining soil fertility ($\bar{X} = 3.14$), ranked 4th, high cost of labour ($\bar{X} = 3.05$), ranked 5th, and weed control infestation ($\bar{X} = 3.02$), ranked 6th, were also significant barriers. Finally, constraints ranked 7th, 8th, and 9th were poor road network ($\bar{X} = 2.95$), poor role of cooperatives and their unions ($\bar{X} = 2.86$), and Poor grades and standard ($\bar{X} = 2.78$).

Table 7: Distribution of Respondents according to Constraints to the Adoption of Cocoyam Enterprise (n= 437)

Constraints	VS	S	NS	Mean	Rank
Inadequate access to credit facilities	21 (27.7)	171 (39.1)	145 (33.2)	3.23	1 st
Inadequate access to farm land	84 (19.2)	217 (49.7)	136 (31.1)	3.20	2 nd
High cost of inputs	91 (20.8)	198 (45.3)	148 (33.9)	3.15	3 rd
Declining soil fertility	69 (15.8)	195 (44.6)	173 (39.6)	3.14	4 th
High cost of labour	59 (13.5)	224 (51.3)	154 (35.2)	3.05	5 th
Weed infestation	88 (20.1)	206 (47.1)	143 (32.7)	3.02	6 th
Poor road network	89 (20.4)	216 (49.4)	132 (30.2)	2.95	7 th
Poor role of cooperatives and their unions	94 (21.5)	190 (43.5)	153 (35.0)	2.86	8 th
Poor grades and standard	89 (20.4)	197 (45.1)	151 (34.6)	2.78	9 th

Note: values in parenthesis were percentage

Source: Field Survey, (2024)

CONCLUSION AND RECOMMENDATIONS

The study concluded that age, household size, membership of cooperative, and contact with extension agents significantly influenced the adoption of cocoyam enterprise in the study area. The study recommended that;

- Affordable and subsidized loans specifically for young Cocoyam farmers should be made available by government and donor agencies.
- Integrated weed and pest management practices, and provide training on sustainable control techniques should be promoted by the extension agents.
- Advocate for land reforms and develop government-supported land leasing programs to ensure young farmers have access to agricultural land.
- There should be investment in rural infrastructure development, including road networks and market facilities, to enhance market access and reduce transportation costs.
- Extension agents should provide capacity-building and training for cooperative leaders and members, and offer support services such as access to finance and market information.

REFERENCES

- Adebayo, O., Bolarin, O., Oyewale, A., and Kehinde, O. (2018). Impact of irrigation technology use on crop yield, crop income and household food security in Nigeria: A treatment effect approach. *Journal of Scientific Research and Reports* 6(3): 210-216.
- Adekunle, O. O., and Adewuyi, T. O. (2021). The Role of Digital Tools in Agricultural Extension Services in Nigeria. *International Journal of Agricultural Extension*, 18(1): 34-49.



- Ademola, E. J., Oyegbami, G. A., and Adeniran, S. A. (2024). Analysis of Gender Based Entrepreneurial Skills Required of Agricultural Education Students for Entry into Oil Palm Production Enterprises in South Western State in Nigeria. *African Journal of Agriculture, Nutrition and Hospitality*, **1**(1): 27-48.
- Ademola, R. G., Ogunleye, K. Y., and Adewole, W. A. (2019). Adoption intensity determinants for improved sweet potato varieties among farmers in Nigeria. *International Journal of Agricultural Management and Development (IJAMAD)*: **9**(3): 203-211.
- Afolabi, B., Danladi, J. D. and Ilugbusi, S. (2022). Determinants of youth engagement in Agribusiness: implications for sustainable agricultural practices in southwest, Nigeria. *Fuoye Journal of Management, Innovation and Entrepreneurship*, **1**(1): 18 – 43.
- Akpan, S. B., and John, D. N. (2020). Technical efficiency of small-scale cassava-based Processors (Cassava grater operators) in Eket Agricultural Zone of Akwa Ibom State, Nigeria. *Nigerian Journal of Agriculture, Food and Environment*, **16**(3): 137-149.
- Akpan, S., Nkanta, V., and Udoh, E. (2023). Agricultural credit policy and livestock development in Nigeria. *Zeszyty Naukowe SGGW w Warszawie-Problemy Rolnictwa Światowego*, **23**(3): 45-60.
- Alabi, A. O. Awotunde J. M. Adekunle A. A. and Adeoye, A. S. (2019). Approaches for Improving Cocoyam Production and Utilization among Rural Farmers in Ogun and Oyo State, *Nigeria Journal of Biology, Agriculture and Healthcare* **9**(24): 44-54
- Amenta, V., Aschberger, K., Arena, M., Bouwmeester, H., Moniz, F. B., Brandhoff, P., and Peters, R. J. (2015). Regulatory aspects of nanotechnology in the agri/feed/food sector in EU and non-EU countries. *Regulatory Toxicology and Pharmacology*, **73**(1): 463-476.
- Babbie, C. A., (2016). Youths' involvement in rice production in Bende Local Government Area of Abia State, Nigeria. *Journal of Agricultural Extension*, **27**(1): 75-85.
- Chukwuma, I. C., & Eze, A. I. (2020). Role of Extension Services in Promoting Agricultural Enterprises among Youth in Southeast Nigeria. **15**(2), 67-79.
- Edeh, H. O., and Nwosu, A. C. (2018). Household Size and Agricultural Productivity in Rural Nigeria. *Journal of Development Studies*, **22**(1): 89-101.
- Enibe, D. O. Nwobodo, E. Nworji, C. M. J. and Okonkwo, C. A. (2019). Economic Analysis of Cocoyam Marketing in Anambra Agricultural Zone of Anambra State, Nigeria. *Asian Journal of Agricultural Extension, Economics and Sociology* **29**(3): 1-10.
- Hunter, M. C., Smith, R. G., Schipanski, M. E., Atwood, L. W., and Mortensen, D. A. (2017). Agriculture in 2050: recalibrating targets for sustainable intensification. *Bioscience*, **67**(4): 386-391.
- Ibrahim, A. M., and Musa, J. A. (2019). Effectiveness of Radio and Television in Disseminating Agricultural Information to Rural Farmers in Nigeria. *Nigerian Journal of Agricultural Extension*, **21**(2): 89-101.
- International Fund for Agricultural Development [IFAD]. (2019). Creating opportunities for rural youth. 2019 Rural Development Report. https://www.ifad.org/documents/38714170/41133075/RDR_report.pdf/7282db66-2d67-b514-d004-5ec25d9729a0
- Menashe-Oren, A., & Stecklov, G. (2018). Rural/urban population age and sex composition in sub-Saharan Africa 1980–2015. *Population and development review*, 7-35.
- National Population Commission [NPC] (2006). Census Exercises in Nigeria. *Journal Homepage: http://ijmr.net.in*, **10**(3).



- Njeru, K. (2017). Influence of access to land and finances on Nigeria Youth participation in agriculture: a review. *International Journal of Development and Economic Sustainability*, **2**(3): 10-24.
- Nwakor, F. N., Anyaegbunam, H. N., Olojode, J. C. And Nzeakor, F. C. (2019). Assessment of factors influencing Cocoyam production among Farmers in Southeast Zone of Nigeria. *Journal of Agriculture and Social Research (JASR)*. **16**(2): 56-64.
- Obiora, C. and Ajala, A.A. (2018). Socio-economic and Cultural Importance of Cocoyam as a Staple. A case study of Nsukka Agricultural zone: Paper presented at the 27th National Workshop on Cocoyam. August 16 – 21, NRCRI, Umudike, Nigeria.
- Ogbonna, S. I. (2018). Informal savings strategies among farm headed households in Ohafia Local Government Area of Abia State, Nigeria: A gender situation analyses. *Nigeria Agricultural Journal*, **49**(2): 284-293.
- Okeke, U. N., and Eze, S. C. (2019). Formal Financial Institutions and Agricultural Credit in Rural Nigeria. *Nigerian Journal of Agricultural Economics*, **22**(3): 105-119.
- Okocha, P. C., Eze, S. C., and Nnaji, G. A. (2020). The Role of Extension Agents in Agricultural Information Dissemination in Nigeria. *Journal of Agricultural Extension*, **24**(3): 65-78.
- Oladimeji, Y. U., and Abdulsalam, Z. (2019). Agricultural Production Activities, Profit Efficiency Nexus Livelihood Diversification among Public Servant Households in Kwara State Nigeria. *Journal of Agriculture and Ecology Research International*, **17**(2): 1-9.
- Olaniyi, O. A., and Adeoye, I. B. (2020). Youth Participation in Agricultural Enterprises in Nigeria: A Path to Sustainable Development., **12**(3): 56-66.
- Omotesho K. F., Kayode A. O., Adebayo S. A., Akinrinde, A. F. and Mohammed A. J. (2020). Potentials for the commercialization of cocoyam in Oyun local government area, Kwara State, Nigeria. *Agro-Science: Journal of Tropical Agriculture, Food, Environment and Extension*, **19**(3): 8–14.
- Opata, P. I., Okorie, O. J., Iwuchukwu, J. C., Ume, C. O., and Oyinbo, O. (2021). Adoption of improved cassava varieties in Nigeria: Insights from DNA fingerprinting versus self-reporting varietal identification approaches. *Outlook on Agriculture*, **50**(3): 269-276.
- Sennuga S. O., Fadiji T. O. (2020): Effectiveness of Traditional Extension Models among rural dwellers in Sub-Saharan African Communities, *International Journal of Advanced Research*, **8**(4): 401-415.
- Suleman, A. (2019). Analysis of Rural Farmers use of Improved Cocoyam Production Practices South South Nigeria. A Thesis Submitted to the Postgraduate School, Federal University of Technology, Owerri, Nigeria.
- Temidayo, G. A., Ekeocha, A. H., Jaiyeoba, C. Igbalajobi, O., Oni, K., Bamigboye, O. and Bamsaye, S. (2021). Value Chain Analysis of Cocoyam Enterprise in Southwest Region Nigeria. *Cross Mark Journal*, **17**(03): 52-63.
- Wandji, D. N., Pouomogne, V, Binam, J. N., Nouaga, R. Y. (2021). Farmer's Perception and Adoption of New Aquaculture Technologies in the Western Highlands of Cameroon. *Tropicultural* **3**: 30, 180-184.