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FOOTNOTES should be avoided as much as possible. Acknowledgements should appear after Conclusion before the reference list.

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IMPROVED FISH PROCESSING TECHNOLOGY (IFPT) UTILISATION IN SOUTH-SOUTH NIGERIA

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ABSTRACT

High post-harvest losses have been a major impediment to fisheries' contributions to the nation's economy. The panacea to this is an efficient and effective utilisation of improved fish processing technologies (IFPT). This study examined the utilisation of IFPT in the South-South region of Nigeria. A total of 240 fish processors were selected using multistage sampling procedure. While interview schedule was used for data collection, data were collected on socio economic status, sources of information as well as awareness IFPT. Frequency counts, percentages, means and inferential analytical techniques were used for data analysis. Result reveals that majority (82.1%) of the respondents were females, within the age range of 30-59 years, 85.6% were literate with a mean year of experience and household size of 20 years and 11 persons respectively. Results further shows that 57.6% of respondents were aware of improved technologies and the dominant information source was through friends (34.2%), then family member (16.7%) and radio (10%). The respondents were more familiar with Drum oven (1.97%), Chokor (1.96%) and Burkinade (1.77%), as IFPTs. Distribution by utilisation of IFPT shows Drum oven (51.9%), Chokor (15.66%) and Watanabe (10.9%) and the constraints to the respondents' use of the technologies were lack of capital (33.3%), epileptic power supply (20.4%) and unaffordability of equipment (16.3%) in that order. Respondent's age, sex, marital status, and education were significantly related to the fish processors' utilisation of improved technologies at 1 and 10% respectively. It is recommended that the capital or zero-interest-loan should be provided to educated young, female but married fish processors who are the majority in this technology to motivate them to adopting IFPT, given the fish processing rural setting.

Keywords: Improved fish technologies, Fish processing, Radio, Extension communication method and Bookkeeping

INTRODUCTION

In spite of the growth in livestock, poultry and fish industries, protein deficiency still persists (Nkeme, Ndaeyo and Akpaeti, 2013) leading to malnutrition, thereby reducing efficiency and productivity and causing diseases and poor standard of living. Thus, preserved quality fish is relied upon to make up the deficit in animal protein supply. The Food and Agricultural Organisation (FAO, 2019) reported that fish protein contributes 50.0 kg caput/day to the protein intake of an average Nigerian. As such, fish is becoming one of the most important components of human nutrition consumed by large portions of the population in the country. Apart from fish being used as a major source of dietary protein and micronutrients lacking in plants for millions of people, it is also rich in macronutrients like iron, zinc, magnesium, phosphorous, calcium, vitamins (A, B₁, B₂, C and D) and iodine which aids in body neurological development (Abolagba and Nuntah, 2011). However, fish is a low acid food which is very susceptible to the growth of food poisoning bacteria. With this, it is an extremely perishable food material and hence susceptible to high post-harvest losses (Nkeme, 2008).

When large amounts of fish are lost in quality and quantity after harvesting, it translates into losses in nutritional contribution of fish to the total diet and health of populations (Getu, Misganaw, and Bazezew 2015). Losses due to rapid deterioration and spoilage of fish after being caught brings unpleasant taste, smell and texture which

results in a range of different products, thus reducing consumer's acceptability (Oyediran, Omoare, Oladoyinbo, Ajagbe and Dick, (2016). In this regard, over 80% of fish produced in Nigeria is sold live at not too profitable price, as poor quality fish constitutes an economic loss to fisher folks (Federal Ministry of Agriculture and Rural Development, FMARD, 2014).

The Fisheries subsector which occupies a unique position in the agricultural sector that makes up a sizeable portion of economic activities in Nigeria has over the years risen to the challenge of high incidence of post – harvest losses. The case is worst hit by the stunted developmental potential and technological know-how especially in boom seasons (Daramola, Fakoya, Apantaku, Alegbeleye, and Adekoya, (2008). The case is aggravated by the high concentration of the agricultural sector on crop production which accounts for 90% of output; while fishery, forestry and livestock account for the remaining 10% only (Olajide, 2012).

This is against the fact that Nigeria has only met about 40% of her total fish needs while importing frozen and canned fish to supplement the deficit (Bolorunduro and Adesehinwa, 2005). This is at the expense of scarce foreign exchange and at times unverified hygienic conditions. The south-south region of Nigeria, which by implication housed the artisanal fish-rich copious waters in the country, is not excluded. According to the Federal Department of Fisheries (FDF, 2017), the quantity of fish available for consumers in the south - south



region is on a decrease with high estimated post – harvest and exponential population growth.

Many studies, Eyo (2013); FAO, (2015) and Oyediran, *et. al.* (2016) estimated post – harvest fish losses in their different works to be 30% - 65%. They all agreed that losses have not only contributed significantly to the decline in the quantity of fish available to consumers, it has reduce to a very great extend the quality of fish and fish products in the country.

Sequel to the afore-mentioned cases and more, International and Government Organisations have risen to the aid of the fishers. These they have done in form of efforts to fund research institutions to develop technologies and innovations to check post – harvest losses that had been disseminated by extension agencies to fisher-folks (Nkeme, *et al.*, 2013). However, most of these technologies and innovations have not gone to the fisher-folks because of their remote enclaves and spatial distributions and, for the fact that this component of value addition is exclusively handled by the Women-in-Agriculture (WIA).

Be that as it may, fish had long been processed within the riverine communities of the south-south. Smoke-drying had been the integral processing method in the South-South (Effiong and Tafa, 2015). Other traditional methods include but not limited to salting, smoking, sun-drying, fermentation, grilling and frying (Nkeme, 2008). These traditional methods of fish processing according to Nkeme, *et al.*, (2013) have not effectively and efficiently prevented microbial spoilage of harvested fishes. This invariably means that post-harvest losses of fish cannot be effectively eliminated using traditional processing methods. The shortcomings of these traditional methods of fish processing in Nigeria led to the introduction of improved fish processing technologies (Kamaldeen, Isiaka, Arowora and Awagu; 2016). The new technologies are effective and efficient and can significantly retain fish freshness, reduce fish spoilage, improve their nutritional values, taste and market quality thereby prolonging the fish shelf life.

World Development Report (WDR), (2018), emphasises on the importance of agricultural technologies and innovations. They reported that mutually supportive, often knowledge intensive, innovations enable country's agricultural producer to move up the value chain in international agricultural export markets. In the same vein, Jamilah, Azril, Jegak, Asiah and Azman *et al;* (2017) noted that when knowledge is successfully transformed, it can yield innovation, which in turn enhances the competence, productivity, competitiveness and livelihoods of agents in the value chain addition. Now that there are new technologies for the reduction or total eradication of post-harvest losses, Extension services delivery should step up their action since it is the only grass

rooted agricultural structures for dissemination of time tested and proven value chain technologies. This clarion call is against the backdrop of the effective extension service roles which includes facilitating the development of technology, supporting its adoption and utilisation by end users, fostering linkages with relevant service providers and institutions and providing feedback for further improvement of the system (Vignare, 2013). The provision of such relevant services requires proper assessment of the effective and efficient utilisation of extension agents contact strategies to the fish processors. Given the importance of fish, potentials and the possibility of exploiting, harnessing and exceeding the current gain in the fish value chain addition level in Nigeria, there is need to investigate the level of utilisation of this improved processing technologies by fish processors in the South-South region of Nigeria. Specifically, the study sought to:

1. described the socio-economic characteristics of the respondents
2. identified processor's sources of information
3. ascertained respondents' awareness of improved processing technologies
4. identified improved processing technologies used among the fish processors and
5. examined constraints to utilisation of the technologies by fish processors.
6. examine the relationship between socio-economic characteristics of the respondents' and level of utilisation of IFPT

The hypothesis of the study was stated that there is no significant relationship between socio-economic characteristics of the respondents' and level of utilisation of IFPT in the study area.

Methodology

The study area was South –South region of Nigeria which lies at the point where river Niger meets Atlantic Ocean through the Gulf of Guinea. It has an average annual rainfall of 1,200 to 2,500mm. The South-South region is made up of six (6) States of the Federal Republic of Nigeria; namely; Akwa Ibom, Bayelsa, Cross River, Edo, Delta and River States. Fish processors in the south-southern states constituted the population for the study. A multi-stage sampling procedure was used in the selection of the respondents. Fifty percent of the six states in the south-south geopolitical zone (Akwa Ibom, Cross River and Rivers) were randomly selected for the study. Akwa Ibom has 6 zones, 40 blocks and 226 cells, Cross River has 3 zones, 18 blocks and 144 cells while Rivers has 3 zones, 24 blocks and 192 cells. From the three selected states, two agricultural zones each were purposively selected because of their high involvement in fish processing, totalling 6 zones. Two agricultural blocks from each

of the selected agricultural zones which are notable for their fishing occupation were purposively sampled. From each of the selected blocks, two agricultural circles where fish processors dominate were selected purposively. Lastly, ten fish processors were randomly selected from the selected agricultural circles to give 240 respondents. Utilisation of IFPT as a variable was analysed using a 3-point categorisation rating scale with response options of mostly utilised, utilised, and not utilised scored as 3, 2, and 1. Mean score of 2.0 and above were adjudged highly utilised and mean scores below 2.0 were adjudged lowly utilised. Structured questionnaire were used in collecting data from the respondents. Data were analysed using descriptive (frequency, percentages and means) and P-value inferential statistics.

RESULTS AND DISCUSSION

Socioeconomic characteristics

Table 1 presents the mean age of the respondents to be 43.5 years. This implies that most of the respondents were within the economically and active age brackets. Majority (82.0%) of the respondents were women. This corroborates the findings of FAO (1999), Bolorunduro (2004) and Nkeme, (2008) and Azeza, (2009), Getu, Misganaw and Bazezew, (2015) that women were primarily responsible for post-harvest activities. Specifically, Oyediran *et al.* (2016) reported that women were highly involved in every aspect of fish processing and marketing in the rural areas and this contributes to their economic empowerment, food security and poverty reduction. By implication, women who participated in fish processing were motivated to adopt new technologies that offer nutritional benefits. Most (72.0%) were married thus, presumed to have responsibilities to their families. These responsibilities according to Olawepo, (2010), would likely make them willing to seek processing technologies to increase their income-earning capacity and improve their standard of living. This implies that majority of the fish processors have family responsibilities, and this requires more

financial commitment which serves as a motivation for them to utilise improved fish processing technology so as to enhance their income. In terms of household size, 74.5% had household sizes of 6 persons or more. Overwhelming majority (85.6%) of the respondents had attained different stages of formal education. The implication of this result is that majority of the respondents have the capability to adopt and utilise new fish processing technologies. This is because education creates a positive rational approach for the acceptance of new ideas and practices. The study agrees with the findings of Vignare, (2013), Akpabio, (2014) and Effiong and Tafa, (2015) who reported that the higher level of educational attainment of respondents enhances ready adoption and utilisation of technology through information sharing, distribution and access innovation within a short time. The findings also agree with Olajide, (2012), Nkeme, *et al.*, (2013); Akpabio, (2014), Jamilah, *et al.*; (2017); which affirmed that education is crucial for easy understanding of improved methods of agricultural production. The result also shows that most (58.8%) of the respondents had relatively high experience in fish processing; which they acquired over a long period. This places them in a good position to utilise and appreciate the improved processing technologies. Most (74.5%) of the respondents did not have extension contacts in their locality. The inadequate and ineffective extension delivery system coupled with the spatial habitation within the coastal areas may be the reason why majority of them had no extension contacts but got information of the improved fish processing technology from fellow fish processors. This implies that extension education impact within the study areas on fish processing units is low. Poor extension contacts often result in poor utilisation of relevant information on improved agricultural technologies and could be a discouraging factor for the fish processors. The frequency of extension contacts determines the level and rate of adoption and utilisation in any extension programme.

Table1: Distribution of respondents by their socioeconomic characteristics (n=240)

Socioeconomic variables	Percentage	Mean value
Age range (years)		
Below 30	14.7	45.5
31 – 40	27.5	
41 – 50	32.5	
51 – 60	21.6	
61 and above	7.9	
Sex		
Female	82.1	
Male	17.9	
Marital Status		
Married	72.5	
Single	11.6	
Divorced	17.9	



Socioeconomic variables	Percentage	Mean value
Household size (persons)		
1 – 5	33.3	
6 – 10	45.4	10.5
11 – 15	19.2	
16 and above	2.1	
Level of Education		
No formal education	20.4	
Primary education	33.7	
Secondary education	26.3	
Tertiary education	19.6	
Years of experience		
1-20 years	7.9	
21-40 years	58.8	30.5
41 years and above	33.3	
Income (₦)		
10,000 – 50,000	44.6	25.5
51,000 – 100,000	22.1	
101,000 – 150,000	20.0	
Above 150,000	13.3	
Extension contacts		
No visit	74.5	
Once	22.5	
Twice	2.9	
Thrice	0.0	
Membership of organisations		
Yes	42.9	
No	57.1	
Total	100.00	

Source: Field Survey, 2020

Processors' sources of information on Improved Fish Processing Technology (IFPT)

Table 2 shows that 50.9% of respondents received their information from friends (34.2%), radio (10%), television (1.7%), extension agents (8.8%) and posters (4.5%). The implication is that fish processors would find information from fellow fish processors more credible. This is in consonance with the reports of FAO (2010) and Davies and Davies (2009) that respondents value their ties with friends, neighbours, family members and fellow fish processors. However, Extension agents as source of information scored 8.8% only which question processors-Agents synergy. This is contrary to

Akpabio, (2014) report which states that Agricultural Extension agents are the real sources of agricultural information. However, they do that through rural local leaders and “contact” fish processors selected among the array of fish processors for dissemination of improved technologies within their locality. Radio as a source of information shows scored 10.0% and ranked third. Be that as it may, radio according to Nwachukwu (2018) is another important source of agricultural information dissemination because its affordability. Field survey shows that these processors are well experienced and that may have accounted for the 22.9%

Table 2: Distribution of respondents by sources of IFPT information

Sources of information	Percentage
Friends	34.2
Radio	10.0
Television	1.7
Extension Agents	8.8
Posters	4.5
Magazines	0.0
Extension bulletins	1.7
Family Members	16.7
All of the above	0.0
None of the above	22.9

Source: Field survey, 2020

Fish processors’ awareness on improved fish processing technology

The result in Table 3 reveals that respondents were aware of Watanabe (\bar{X} =1.59), Altona (\bar{X} =1.58), Chokor (\bar{X} =1.96), Burkinade (\bar{X} =1.77), Drum oven (\bar{X} =1.97) and Mechanical

smoking kilns (\bar{X} =1.50) improved fish processing technologies. This may be because the improved processing technologies aided their economic stability, increases cash flow, enhances good quality of fish, reduce post –harvest losses and labour. This is corroborated by Nkeme, *et al*, (2013).

Table 3: Distribution of respondents by level of awareness of IFPT

Improved technologies	Mean
Watanabe smoking kiln	1.59
Altona smoking kiln	1.58
Chokor smoking kiln	1.96
Kainji gas kiln	1.42
Burkinade kiln	1.77
Drum oven	1.97
Solar drier	1.00
Banda	1.42
Mechanical smoking kiln	1.50

Source: Field survey, 2020

IFPT used by the respondents

Table 4 reveals that most popular IFPT used by the respondents was the drum oven (51.9%), this was directly by Chokor smoking kiln (15.66%), watanabe smoking kiln was next with 10.9%, Kainiji gas kiln was 8.8%, and Altona smoking kiln was 7.5%. This result corroborates Oyediran, *et al* (2016) who stated that adoption and utilisation of improved fisheries technologies has been relatively low. The findings conform to Fakoya, *et.al* (2012) and Eyo, (2013) that rural women dominate the processing and marketing of fish in Nigeria using

traditional methods and equipment in their trades. One may deduce that the impact of Research-Extension-Farmers-Inputs-Linkage-Systems (REFILS), the platform that brings all the actors in the technology development, adaptation, dissemination and utilisation together was rather weak in the development of improved fish processing techniques. Tobor, (1993) concluded that fish processing methods generally practice in Nigeria are traditional and consist of sun drying, salted and sun drying, smoke drying.

Table 4: Distribution of respondents by utilisation of IFPT

Improved technologies	Akwa Ibom State	Cross River State	Rivers state	Total
Watanabe smoking kiln	3.8	2.9	4.2	10.9
Altona smoking kiln	2.8	1.8	2.9	7.5
Chokor smoking kiln	5.25	4.31	6.1	15.66
Kainji gas kiln	2.9	1.8	4.1	8.8
Burkinade kiln	0.8	0.11	0.9	1.81
Drum oven	16.2	15.3	20.4	51.9
Solar drier	0	0	0	0
Banda	0.61	0.21	0.43	1.25
Mechanical smoking kiln	0.72	0.56	0.9	2.18
Total	33.08	26.99	39.93	100

Source: Field survey, 2020

Constraints militating against fish processors’ utilisation of improved fish processing technologies (IFPT)

In Table 9 the respondents identified lack of capital (33.3%), epileptic electricity (power supply, (20.4%), un-affordability of improved fish processing equipment (16.3%), high cost of transportation (11.3%) and lack of training by extension personnel (9.2%) as their most pressing obstacles to the effective utilisation of improved fish processing technologies. Other problems identified

by the respondents were high cost of fresh fish (5.4%) and inadequate monitoring (4.2%). According to Aniebeze (1997), these problems have been observed to be the major reasons for high incidence of post–harvest losses, scarcity of fish and high cost of fish products. Moreover, Daramola *et al*. (2008); Yvette (2013); Getu *et al* (2015) and Oyediran *et al*. (2016) in their findings reported that these were lingering problems that are yet to be addressed by the government and stakeholders in the fisheries sector.



Table 5: Distribution of respondents based on constraints to utilisation of improved fish processing technologies (IFPT).

Problems	Percentages (%)
Lack of capital	33.3
Epileptic power supply	20.4
Unaffordable equipment	16.3
High transportation	11.3
Lack of Extension personnel	9.2
High cost of fresh fish	5.4
Inadequate monitoring	4.2

Table 6 reveals the results of inferential analysis of respondents' socioeconomic characteristics and utilisation of improved fish technologies. It shows there was a significant relationship between respondents' ages ($\chi^2=12.67$; $p=0.005$), Sex ($\chi^2=14.38$; $P=0.001$), marital status ($\chi^2=2.136$; $P=0.25$) educational level ($\chi^2=23.74$; $P=0.37$) and utilisation of improved fish processing technologies. This indicates the respondents' age was significant to the use of improved fish processing technologies. This was expected because younger processors (as seen with the mean age of 45.5 years) would readily embrace innovations to cushion drudgery. This is in line with Akpabio, (2014) who reported that younger fish processors would likely embrace innovations. Equally, sex was significant at 1% to the use of improved fish processing technologies. This is in line because the

sector was predominantly flooded by women and the curiosity of women couple with their youthful age lends to this finding. Kamaldeen *et al.* (2016) findings in Kano supported this assertion. Marital status was significant at 25% level. This may not be unconnected with enormous financial family responsibilities as every family is interested in the education and wellbeing of their siblings. Jamilah *et al.* (2017) agreed to the fact that responsibilities of work life affect work performance and functions. Education of all other socio-economics characteristics was significant. This was expected because education is synonymous with positive changes, and it is the educated that are apt to embrace positive changes in life. This is agreed to by Nkeme, (2008) who stated that education is the bedrock to acceptance and trail of fish processing innovations.

Table 6: Relationship between selected socioeconomic characteristics and level of processors' utilisation of fish improved processing technologies

Socioeconomic characteristics	χ^2	df	p-value
Age	12.67***	3	
Sex	14.38***	1	
Marital Status	2.136*	3	
Educational Level	23.74*	3	

Source: Survey data 2020.

***, **, * = 1%, 5% and 10% levels of probability

Conclusion

The study concludes that majority of fish processors were young married women, lettered and of good years of experience. They relied mostly on friends, family members and radio for their fish processing information. They are aware of the improved fish processing technologies highlighted in the study. The technologies listed are: Watanabe smoking kiln, Altona smoking kiln, Chokor smoking kiln, Drum oven, Kainji gas kiln etc. However, it was the drum oven that was the most utilised of all the improve fish processing technologies. The most pressing constraints as enumerated by the respondents was lack of investible capital seconded by epileptic power supply. Be that as it may, the respondents' age, sex, marital status and education were significant to the utilisation of these improved fish processing technologies.

It is recommended that the relevant agents should make investible capital available at a very low interest rate and affordable collateral; channelled through functional fish processor's cooperatives for the educated young, female but married respondents. Equally, power supply should be stepped up at the riverine suburbs and fish processors should be encouraged to join functional co-operative societies in order to access fish processing information and credit facilities. Equally, effective Research-Extension-Farmers-Inputs-Linkage-Systems (REFILS), the platform that brings all the actors in the technology development, adoption, dissemination and utilisation should be strengthened. Appointment of contact agents among fish processors to train more fish processors on IFPT as well as full implementation of a well – designed capacity building programme so as to maintain a sustainable extension service delivery system.

REFERENCES

- Abolagba O. J. and Nuntah J. N., (2011) Processing and distribution of smoked *Clarias spp.* in Benin City, Edo State, *Int. Res. J. Biotech.*, 2(9):213 – 219
- Akpabio, I.A. (2014). Redefining Agriculture for Sustainability in Nigeria. Paper Presented at the 2014 Charles Esu Annual Dialogue; March 20,22pp
- Anibeze, C, I, (1997). Fish Farming in Nigeria. Delta Publication (Nigeria) Limited, Enugu State. p45
- Azeza, N.L (2009). Reduction of fish spoilage in Lake Chad through Improved Fish Processing and Transport:Elsevier Applied Science, Londo. (Accessed on 4th November, 2019
- Bolorunduro, P. L (2004). Post-harvest loss assessment and adoption of disseminated technologies in the artisanal fisheries of North-western Nigeria. PhD thesis; Department of Wildlife and Fisheries Management, University of Ibadan, p 242 .
- Bolorunduro P.I., Adesehinwa A.O.K, and Ayanda J.O. (2005). Adoption of Improved Fish Preservation Technologies in Northwestern Nigeria.*TROPICULTURA*, 23 (3): 117-123.
- Daramola, B. G., Fakoya, E. O., Apantaku, S. O., Alegbeleye, W. O. and Adekoya, B. B. (2008). Ogun State Farmers Constraints to the use of integrated fish farming. *Faman Journal*.3: 23-25
- Davies R.M. and Davies O.A. (2009). Traditional and Improved Fish Processing Technologies in Bayelsa State, Nigeria. *European Journal of Scientific Research*, 26 (40):539-548
- Effiong P.N. and Tafa J. L, (2015). Proximate Composition of Nutrients in Adult *Clarias Gariepinu Heterobranchus longifilis* and their hybrid (*Heteroclarias*), Proceedings of the 20th Annual Conference of the Fisheries Society of Nigeria (FISON), Port Harcourt, 550-553
- Eyo, A. A. (2013). Fish Processing Technology in the Tropics. Published By University of Ilorin Press, Nigeria. Pp. 1 – 402.
- Fakoya, E. O. Oyediran, W. O. and Omoare, A. M. (2012). Economics analysis of fish Processing among rural women in Epe Local Government Area of Lagos State, Nigeria. Proceeding of the 7th FUTA-AGRIC conference, Akure, Nigeria, pp. 157
- Federal Department of Fisheries (FDF) (2017). Fisheries Statistics of Nigeria. 15th Ed. p: 19.
- Federal Ministry of Agriculture and Rural Development, FMARD, (2014). Report of Presidential Committee on Fisheries and Aquaculture Development. *Consolidated Report of Federal Department of Fisheries, Federal Ministry of Agriculture and Rural Development*. Abuja (1):13-25
- Food and Agriculture Organization (FAO, 2010). Post-harvest Losses in small-scale Fisheries Case studies in five sub-Saharan Africa countries. *FAO Fisheries and Aquaculture Technical Paper* 550. 72p.
- FAO (2015). Food and Agricultural Organisation. The FAO Fishery and Aquaculture Country Profiles. Available at:www.fao.org/fi/website/FISearch.do?do m=country 24/2/2020.
- Food and Agriculture Organization and World Fish Center (2019). The Hidden Harvests –The global contribution of capture fisheries. Conference Edition. Washington, DC.
- Getu, A., Misganaw, K. and Bazezew, M. (2015). Post-harvesting and Major Related Problems of Fish Production. *Fish Aquaculture Journal*, 3(6):41-42
- Jamilah, O., M. S.H. Azril, U. Jegak, M. Asiah and A.N. Azmanet, (2017). Can quality of Work life affect work performance among government agriculture extension officers? A case from Malaysia. *Journal of Social Science*, 7: 64-73.
- Nkeme, K. K (2008). Adoption of Chokor smoker Kiln by fish processor in rural community of Akwa Ibom State, Nigeria. A MSc Thesis, Micheal Okpara University of Agriculture Umudike, Nigeria. Pp.11-34
- Nkeme, K. K., Nyaudoh U. Ndaeyo and Aniekan J. Akpaeti (2013) Chokor Smoker Kiln Technology Adoption in Akwa Ibom State: Constraints and Prospect. *American Journal of Research Communication*, 13: 88-97.
- Nwachukwu, I., (2018). Access to Agricultural Information among fish farmers in Niger Delta region of Nigeria. In: Sustainable Community Development. SCCDR Publishers <http://sccdr.org> 215-237p
- Kamaldeen, O. S., Isiaka A. A. Arowora K. A, Awagu E. F. (2016). Development of an Improved Fish Smoking Kiln. Nigerian Stored Products Research Institute, Kano Station, PMB 3032, Hadeija Kano, Nigeria. *International Journal of Engineering Science and Computing* 6(7) 1925-1932
- Okunade, E. O. (2017). Effectiveness of Extension methods in acquiring knowledge, skills and attitude by women farmers in Osun State. *Journal of Applied Science Research*, 4: 283-287.



- Olawepo, R. A. (2010). Determining rural farmer's income a rural Nigeria experience. *Journal of African Studies and Development* 2(2):15-27
- Olajide, B. R. (2012). Assessment of farmers' access to agricultural information on selected Food crops in Ido district of Oyo State, Nigeria. *Journal of Agricultural and Food Information*, 12:354-364
- Oyediran, W. O., Omoare, A. M., Oladoyinbo, O. B., Ajagbe, B. O., and Dick, T. T. (2016). Constraints limiting the effective utilisation of low-cost fish processing technologies among women in selected fishing communities of Lagos State, Nigeria. *Fisheries and Aquaculture Journal*, 7:4, 3 – 5
- Tobor, J.G. (1993). The fishing Industry in Nigeria Status and potential for self sufficiency
- Vignare, K. (2013) Options and Strategies for Information and Communication Technologies within agricultural extension and advisory services. Michigan State University, Pp 11-19.
- World Bank (2018). Agriculture for Development. World Bank Report, Washington Dc. pp.156 -456

GENDER'S TIME UTILISATION PATTERN AMONG RURAL DWELLERS IN OGUN STATE, NIGERIA

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ABSTRACT

This study examined time usage pattern over a 24-hour period among rural dweller' in Ogun State, Nigeria. The study specifically assessed the socio-economic characteristics, average daily time allocation to work and pattern of unpaid care work of the rural dwellers. Data were obtained through an interview schedule from 240 rural dwellers collected through a three-stage sampling procedure. Data were collected on socioeconomic characteristics and average daily time allocation. The data were analysed using frequency counts, means, and multiple regression model. Findings from the study revealed that 54.4% of rural women and 67.5% of rural men were between age group 31-50 years. 20.0% of women spent an average of 4.9 hours on productive work when compare to 34.7% of men spending an average of 8.4 hours. 25.6% of women spent approximately 6.2 hours daily on reproductive work, which is higher than that of the 5% of men spending 1.1 hour per day. Cooking and domestic chores accounted for 88.0% of daily total time allocated for unpaid care work. Rural women's age at first marriage ($\beta=7.08$), education ($\beta=4.11$), income ($\beta=1.32$), value of assets brought into marriage ($\beta=2.83$), number of dependants ($\beta=1.11$), presence of co-wives ($\beta=0.65$), access to improved water sources ($\beta=0.46$), employment status ($\beta=1.04$) and decision making power ($\beta=0.32$) were the significant factors influencing their average daily time devoted to unpaid care work. It is concluded that an unevenly distributed burden of work exists, particularly unpaid care work with the women's' playing dominant roles in comparison to their male counterparts. Hence, policy issues aimed at reducing the labour burden of women's unpaid care, should focus more on improving rural livelihood strategies that are gender responsive.

Keywords: Labour burden, farm households, time poverty, unpaid care work

INTRODUCTION

Asian Development Bank and United Nations Women (2018), define unpaid work as any economic activities that are directly not remunerated, which include tasks performed either at household level or family business, or domestic chores such as cooking, cleaning, fetching water and fuelwood, and the direct care of children, the sick and elderly. Folbre (2018) defines unpaid care work as non-market work carried out in households primarily by women but also to some extent by girls, men and boys. These activities even though are being recognized as work are often not documented or accounted for in the national accounts system.

Time is a limited resource and every individual daily allocate time in unpaid care work considered as work, because theoretically one could pay a third person to perform them. Typically, unpaid care work is allocated more time among women than men (Asian Development Bank, ADB, 2015) and due to gendered social norms, unpaid work is globally viewed as a female prerogative, making women across different races, socio-economic classes, regions, and cultures to allocate part of their daily time to unpaid care work. This unpaid care work coupled with paid productive activities, create "double burden" of daily work for women. Folbre, (2018), reveal unpaid care work is a major constraint to women's participation in activities outside the household, including paid work and labour market.

According to World Bank Group (2019), women make up 45.5% of the Nigerian labour force with greater number in agriculture and non-farm enterprise. Women, generally work as subsistence farmers, paid or unpaid workers on family farms or as entrepreneurs running on-farm, off-farm and non-farm enterprises. In recent time, there has been a significant growth in female labour force participation, however, little progress has been made in changing the pattern of distribution of unpaid work (ILO, 2018). According to ILO (2018), the last three decades had experienced a narrowed gap between women's and men's contributions to unpaid care work by seven minutes per day and as a result, women keep working longer hours than men.

Globally, women carry out 76% of the total amount of unpaid care work, which is three times more than men as documented by International Labour Organization, ILO (2018). Women who become overwhelmed with unpaid care work, often do not get leisure or self-care time. They are physically stressed and suffer exhaustion. Large number of women do admit to have experienced a severe burnouts in trying to strike a balance. The Women Right Advocate (WRA) has identified the unequal share of unpaid care work as a key dimension of gender inequality and further considered in economic policy discussions as a constraint to both economic growth and women's economic empowerment (United Nations, 2016).



UNICEF (2016) assert that girls of 10 to 14 years spent approximately 50% of the time engaging in house chores than boys of the same age group. Girls at early age are usually socialized to be caregivers. A survey conducted in 2013 by the Pew Research Center found that United States working mothers spent an average of 14.2 hours per week on housework compared to fathers' 8.6 hours that are working (Parker, 2015). A time-use survey constructed in the same year in Mozambique revealed that while income-generating work of women was similar to that of men, house chores and caregiving were almost entirely women's responsibility (Arora, 2015). In spite of the above assertion, gender disparities in unpaid care work remain hesitant to change.

Addressing the burden of unpaid care work is important to achieving gender equality and women's empowerment as identified in the 5th Sustainable Development Goal (SDG 5.4). The United Nations Secretary-General's High-Level Panel on Women's Economic Empowerment established in September 2015, went further and highlighted the need to recognize, reduce and redistribute (3Rs) unpaid care work as one of seven important determinants of women's economic empowerment (United Nations, 2017b). According to Elson (2017), the 3Rs have been widely adopted by women right advocate as the framework for policies in addressing unpaid care work.

Despite the welfare role of unpaid care work in household welfare, it is commonly excluded from policy issues because of the misperception that it is difficult to value and therefore not relevant for policies. However, neglecting the unpaid work leads to wrong conclusion on the levels and changes of individuals' well-being. To gain a rich picture of unpaid care work in Nigeria, there is the need to analyse the allocation of time among a range of farm households' unpaid care activities as well as the determinants in Ogun State, Nigeria. The specific objectives of the study were to:

- 1 describe the socioeconomic characteristics of rural dwellers;
- 2 describe the average daily time allocation of the respondents;
- 3 describe the pattern of unpaid care work of the rural women; and
- 4 determine the socio-economic factors influencing rural women's unpaid care work in the study area.

METHODOLOGY

This study was carried out in Ogun State, Nigeria. Ogun State is one of the fastest developing states in Nigeria; lying in the south western part of the country between on latitude 6.2°N and longitude 3.0°E and 5.0°E east of the Greenwich Meridian. The state is bounded on the west by the Republic of Benin and on the east by Ondo State. To

the north is Oyo State while Lagos State and the Atlantic Ocean are to the south. Ogun State is made of up 20 local government areas. The state is divided by the Ogun State Agricultural Development Project (OGADEP) into four operational zones namely Abeokuta, Ijebu Ode, Ikenne and Ilaro zones.

Data for this study was obtained from primary source. This was collected from rural dwellers' in Ogun State using a well-designed interview schedule. The population of this study comprised of married dwellers' particularly husband and wife staying together under the same roof. Data collection involved completing a 24-hour memory recall on the type of unpaid activities and its associated time.

The study employed multistage sampling procedure to collect a cross-section of 240 rural dwellers. First stage was a simple random selection of one (1) block from each of the four (4) Agricultural Development Zone. In Stage two, randomly five (5) cells were selected from each block making a total of 20 cells. The third stage was a random selection of 12 rural dwellers' from each of the selected cells targeting a total of 240 rural dwellers.

Descriptive statistics, such as frequency counts, means, and multiple regression model were used to analyse the data. To assess the daily time allocation to both paid and unpaid work, respondents were asked to choose from a predetermined list of paid and unpaid activities. The activities were grouped into six categories based on Nigeria Way Project (NWP, 2019) into: i. Productive work, ii. Reproductive work, iii. Community work, iv. Personal care, v. Leisure and vi. Sleeping, and Resting. The amount of time spent per day on each activity was estimated for each respondent. These amounts were then disaggregated by sex and averaged across the number of respondents to determine how many minute women and men spent on average on each activity per day.

To ascertain the socio-economics factors that influence women's unpaid care work, this study employed multiple regression model as specified in equation 1:

$$Y_i = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \dots + \beta_{11}X_{11} + \epsilon_{it} \quad (1)$$

Where: Y_i = average unpaid work (hours/day); X_1 = age at marriage (years), X_2 = level of education (years); X_3 = monthly income (N); X_4 = main occupation (farming =1; 0 otherwise); X_5 = membership of social group (yes =1; 0 otherwise); X_6 = amount of assets brought into marriage (N); X_7 = number of dependants (share of children and elderly); X_8 = presence of co-wives and adult relatives (yes =1; 0 otherwise); X_9 = access to improved water source (yes =1 ; 0 otherwise); X_{10} = employment status (employed=1; 0 otherwise); and X_{11} = decision-making power (index).

RESULTS AND DISCUSSION

Socioeconomic characteristics

Table 1 shows that 54.4% of rural women and 67.5% of rural men were between the ages of 31-50 years. Large number (49.2%) of the women were illiterate as only 30.4% had primary education while (32.5%) of male had no formal education. Majority (61.7) of the dwellers had 6 members per household. 51.3% of rural women had less than 10 years farming experience. However, 82.1% of rural men had more than 10 years of farming experience. This implies that men had more experience in farming than women. Women represent just 9.2% of landholders in terms of management control over an

agricultural holding as owners or tenants, or through customary rights. However, 12.9% had access to credit. Women’s access to land and property is central to women’s economic empowerment, as land can serve as a base for food production and income generation, as collateral for credit and as a means of holding savings for the future. The results of women’s access to land and credit was lower than that of men. Hence a gender gap exists in access to land and credit. Women were the main decision maker as regards education (76.5%), health (53.3%), food (75.4%), and clothing (61.7%), as a wide gender inequality gap in decision making participation within the household.

Table 1: Socioeconomic characteristics of the respondents

Characteristics	Women		Men	
	Frequency	Percentage	Frequency	Percentage
Age				
Less than 31	66	27.5	34	55.8
31-50	134	55.8	162	67.5
51-70	33	13.8	34	14.2
71 and above	07	2.9	10	4.2
Education				
No Formal education	118	49.2	78	32.5
Primary	73	30.4	120	50.0
Secondary	41	17.1	29	12.1
Tertiary	8	3.3	13	5.4
Household size				
2-5 persons	77	32.1	77	32.1
6 – 9 persons	148	61.7	148	61.7
10 and above	15	6.3	15	6.3
Years of farming experience				
1-5	46	19.2	13	5.4
6-10	77	32.1	30	12.5
11-15	101	42.1	56	23.3
16 and above	16	6.7	141	58.8
Land ownership	22	9.2	126	52.5
Access to credit	31	12.9	108	45.0
Monthly income				
Less than N50,000	163	67.9	48	20.0
N50,000 - N100,000	66	27.5	168	70.0
N100,000 and above	11	4.6	24	10.0
Decision making participation				
Income main contributor	72	30.0	188	78.3
Education	183	76.5	82	34.2
Health	128	53.3	99	41.3
Food	181	75.4	74	30.8
Clothing	148	61.7	68	28.3
Shelter	68	28.3	212	88.3
Land use	42	17.5	202	84.2
Sales of crops and livestock’s	62	25.8	178	74.2

Source: Field Survey, 2019.

Average daily time allocation of the respondents

Table 2 reveals the average daily time activity allocation in the study area. Women (20.0%) spent an average 4.9 hours on productive work. Men (34.7%) spent an average of 8.4 hours of their day

on productive work, which represents 3.5 hours more on average than the women. This implies that women lose so much opportunities as a result of their unpaid care work engagement. 25.6% of women spent approximately 6.2 hours per day on



reproductive work, which is significantly more than the men (4.5%) respondents, who spent approximately 1.1 hour per day on average on reproductive work. 19.0% of women's personal maintenance time accounted for approximately 4.6 hours per day as against 17.4% of men who spent 4.2 hours per day on personal maintenance. Women (7.4%) spent an average of 1.8 hours, while men (11.9%) spent 2.9 hours per day on community activities in the study area. 27.7% of women experienced 6.5 hours of leisure, sleep, and rest time per day on average, while 31.8% of men spent 7.4 hours.

It is therefore confirmed that women divide their daily labour time, balancing both their own business

activities and their domestic responsibilities. This strong gendered division of labour results in women spending less time on engagement in paid forms of labour than men, perpetuating their disproportionate access to financial resources and further limiting their access to credit and other inputs for their business. While it cannot be assumed that all women have the goal of growing their business, this division of labour could be preventing those who want to expand. Women allocated less time in productive, community, leisure, and rest. This indicates a large difference in women's amount of time devoted to paid work when compared to their men counterparts.

Table 2: Average daily time activity allocation

Activities/Works	Women		Men	
	(Hrs/day)	Percentage	(Hrs/day)	Percentage
Productive work	4.9	20.3	8.4	34.7
Reproductive work	6.2	25.6	1.1	4.5
Personal Maintenance	4.6	19.0	4.2	17.4
Community service	1.8	7.4	2.9	11.9
Leisure, Sleep and Rest	6.5	27.7	7.4	31.8
Total	24.0	100.0	24.0	100.0

Source: Field Survey, 2019

Pattern of women unpaid care work

Table 3 shows the average daily time allocation to main unpaid household and community activities. Women spent 27% of their time (6.5 hours) on unpaid work. This implies that unpaid work accounted for 27% on average of a 24-hour day. However, cooking accounted for 51.2% of the

total time for the unpaid work. This is followed by cleaning and domestic chores (37.1%). This indicates that women are more overwhelmed with unpaid care work, and often do not get leisure or self-care time. Hence, are physically stressed and suffer exhaustion.

Table 3: Unpaid average daily time allocation

Unpaid Work	Hours	Percent
Cooking	3.3	51.2
Cleaning and domestic chores	2.4	37.1
Children and Adult care	0:5	7.5
Community Service	0:3	4.2
Total	6.5	100.0

Source: Field Survey, 2019

Determinants of women's unpaid care work

Rural women's age at first marriage ($\beta=7.08$), education ($\beta=4.11$), income ($\beta=1.32$), value of assets brought into marriage ($\beta=2.83$), number of dependants ($\beta=1.11$), presence of co-wives ($\beta=0.65$), access to improved water sources ($\beta=0.46$), employment status ($\beta=1.04$) and decision making power ($\beta=0.32$) were the significant factors influencing their average daily time devoted to unpaid care work. A positive relationship existed between women's average age of marriage and unpaid work. The implication of this is that the earlier the aged women enter into the marriage, the higher their burden of unpaid care work. Level of education had a negative effect on the average daily time devoted by women to unpaid care work. This

implies that educated women often use livelihood activities as an alternative to unpaid work. Also, income had a negative effect on women's unpaid work. This result confirmed the assertion of Singh and Pattanaik (2019) stated that income of the household is more important for women to demand paid work and exit from unpaid domestic work. The value of asset women brought into marriage had a negative effect on their unpaid work. The number of dependants influenced women's unpaid work positively. This implies that the higher the proportion of household member that dependants particularly under 14 and over 65 years, the more the women's likelihood to be engaged in more unpaid work. This is because, women are often devoting more care for children and elderly. The accessibility

of improved water sources and healthcare was used as a proxy for infrastructure. A negative relationship existed between the quality of infrastructure and women's unpaid work. This implies that provision of these services could reduce the time for unpaid care at household level. Inadequate technology and infrastructure require women to perform physically taxing and time-consuming unpaid work. Employed

women have a lower burden of unpaid work compared to unemployed counterpart. Women decision making power exerts a positive effect on the time women participate on unpaid care work. It is assumed that women with more bargaining power are more likely to spend their time on productive activities that benefit them than unpaid work.

Table 4: Determinants of women unpaid care work

Variables	B	Std. Error	t- values	P-value
Age at marriage	7.085	3.470	2.042	0.010*
Level of education	4.111	-1.947	-2.111	0.055*
Income	1.326	-0.547	-2.426	0.026*
Main occupation	0.923	-0.853	-1.082	0.232
Membership of social group/association	0.377	0.281	1.341	0.557
Value of assets brought into marriage	2.834	-1.299	-2.182	0.021*
Number of dependants	1.116	0.476	2.346	0.035*
Presence of co-wives and adult relatives	0.658	-0.226	-2.911	0.000*
Access to water sources	0.461	-0.207	-2.224	0.022*
Employment status	1.042	-0.343	-3.041	0.003*
Decision making power	0.323	0.114	2.844	0.011*

. F-value 7.12, R² = 0.79

Source: Field Survey, 2019. Note:

* Significant at $p \leq 0.05$

CONCLUSION AND RECOMMENDATION

Findings from this study reveals that a gender gap exists in unpaid care work participation with the women playing dominant roles in comparison to their men counterparts. Hence, in order to reduce the burden of women's unpaid care, efforts of governments should be in the formulation and implementation of decent rural employment strategies that are responsive to gender issues.

REFERENCES

- Arora D. (2015). Gender Differences in Time-Poverty in Rural Mozambique. *Review of Social Economics*, 73:196
10.1080/00346764.2015.1035909
- Asian Development Bank (2015). *Balancing the Burden? Desk Review of Women's Time Poverty and Infrastructure in Asia and the Pacific*. Manila.
- Asian Development Bank and United Nations Women (2018). *Gender Equality and the Sustainable Development Goals in Asia and the Pacific: Baseline and Pathways for Transformative Change by 2030*. Bangkok.
- Elson, D. (2017). *Recognize, reduce and redistribute unpaid care work: How to close the gender gap*, pp. 52-61.
- Folbre, N. (2018). *Developing care: Recent research on the care economy and economic development*.
- International Labour Organization (2018). *"Executive Summary" in Care Work and Care Jobs for the Future of Decent Work*, International Labour Organization, http://www.ilo.org/global/publications/books/WCMS_633135/lang--en/index.htm (accessed on December 2018).
- Malapit, H., Kovarik, C., Sproule, K., Meinzen-Dick, R., & Quisumbing, A. R. (2015). *Instructional Guide on the Abbreviated Women's Empowerment in Agriculture Index (A-WEAI)*. Washington, DC: International Food Policy Research Institute. Women, New York.
- Nigeria Way Project (2019). <https://www.meda.org/projects/nigeria-way/>
- Parker, K. (2015). *Women More than Men Adjust Their Careers for Family Life*. Pew Research Center. Available: <https://www.pewresearch.org/fact-tank/2015/10/01/women-more-than-men-adjust-their-careers-for-family-life/>. Accessed: 6 June 2020.
- Singh, P., & Pattanaik, F. (2019). Economic status of women in India: paradox of paid-unpaid work and poverty. *International Journal of Social Economics* 46(3): 410-428
- UNICEF (2016). *Harnessing the Power of Data for Girls: Taking Stock and Looking Ahead to 2030*. New York, NY: UNICEF.
- United Nations (2016). *Leaving no one behind: A call to action on gender equality and women's economic empowerment*.
- World Bank Group (2019). *Profiting from Parity: Unlocking the Potential of Women's*



Business in Africa.
<https://openknowledge.worldbank.org/handle/10986/31421>

EFFECTS OF COVID-19 ON PRODUCTION ACTIVITIES OF YOUNG AGRICULTURAL ENTREPRENEURS IN KADUNA STATE, NIGERIA

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ABSTRACT

The study investigated the effect of COVID-19 on production activities of the young trained agricultural entrepreneurs in Kaduna State. Employing random sampling procedure, 300 respondents were sampled from the list of young, trained farmers and other youths that registered with the Kaduna State Agricultural Development Agency (KADA) training and capacity development intervention. Primary data were collected through the administration of structured questionnaires. Ninety percent of the respondents were male, while the mean age was 33.6 years. Majority (72.0%) of the respondents had a drastic reduction in demand for their goods and services, 62.0% had a restricted access to agricultural inputs supply, while 53.0% experienced direct effect on their production cost. To mitigate the effect of COVID-19, Some (56.0%) maintained contact with their customers using Facebook while some 55.0% used Instagram. The study concluded that respondents were hit by containment measures adopted to prevent the global spread of COVID-19. Kaduna state government through the Kaduna Agricultural Development Agency training and intervention programme should provide adequate support in form of credit, quality and subsidized inputs as well as useful agricultural businesses information to the trained agripreneurs.

Keywords: COVID-19, Young trained agripreneurs, Kaduna State Agricultural development agency, training and intervention programme

INTRODUCTION

Corona virus disease (COVID-19), a novel disease, became known in December 2019 when it was first identified in reported cases of patients with pneumonia admitted in hospitals in Wuhan, China (WHO, 2020). This disease, which usually spread through airborne zoonotic droplets; infect people when they come in close contact with the cough and sneeze of persons who have symptoms from the virus (WHO, 2020). To curb the spread of COVID-19, virtually all countries of the world including countries in Sub-Saharan Africa (SSA), introduced containment measures. The region responded promptly by closing their airports and land borders before any COVID 19 cases were confirmed. Countries in SSA closed their schools, banned public gatherings and put in place other social distancing measures (Frank and Massoud, 2020). These measures were put in place to restrict movement of people worldwide and enforced the containment, globally. The implementation of the global containment actions to COVID-19 pandemic in Sub-Saharan Africa and particularly in Nigeria further compounded the existing economic crisis in the country, with the attendant effects on the economic activities of Nigerian youths.

To engage Nigerian youths with viable and sustainable agricultural businesses and liberate them out of poverty and economic hardship, Kaduna State Government had partnered Leventis Foundation Nigeria, a Non-Governmental Organization (NGO) with mandate to train youths and develop their capacity in agriculture and agro-allied businesses in Nigeria. Through this partnership, about 3,000 interested youths had been trained by the Leventis Foundation Nigeria in Kaduna State and supported with credit facilities since inception of the

programme in 1988. This is done to adequately position the young trained agricultural entrepreneurs (agripreneurs) as the major drivers of agricultural economy and change agents in the State. Majority of these trained agripreneurs were registered alongside other youths, registered under the youths' training and capacity development intervention programme of the Kaduna State Agricultural Development Agency (KADA) to further benefit from the State's interventions.

Food and Agriculture Organisation [FAO, (2020b)], reported that young people, especially rural youth and informal workers, are particularly vulnerable to the impacts of disruptions caused by the COVID-19 pandemic. The disruptions in agricultural value chains caused by the pandemic, according to FAO (2020b) are exacerbating the existing challenges that young agripreneurs face when engaging in agrifood systems. To strengthen the food system and drastically reduce all forms of insecurity in Kaduna State, a research into the effect of COVID-19 on the young trained agripreneurs in the State becomes very necessary. This study therefore assessed the effects of COVID-19 on the young trained agripreneurs in the state. Specifically the study:

- 1 describe the socioeconomic characteristics of the young trained agripreneurs in the state
- 2 identify the production activities involved in by the respondents
- 3 determine the effects of COVID-19 on their production activities
- 4 Describe strategies adopted to cope with COVID-19 in the area

METHODOLOGY



The study was conducted in Kaduna State. The State shares border with Katsina, Kano and Zamfara States to the north; Plateau and Bauchi States to the east; Niger State to the West, Federal Capital Territory (FCT) to the Southwest and Nasarawa State to the south. It is situated on latitude 10.3764° N and longitude 7.705° E. The major occupation of the people of the State is farming, with majority involved in the cultivation of grains or cereal crops and livestock. The population of the study comprises all the young agricultural entrepreneurs under the KADA training and capacity development intervention between 2010 and 2018. Multistage sampling procedure was adopted in sample selection. In the first stage, four (4) Agricultural Development Zones (ADZs) of KADA namely Lere, Samaru, Maigana and Birnin Gwari Zones were purposively selected because of the spread of the young agricultural entrepreneurs across all the zones in the State. The second stage involved random selection of 2 local government areas (LGAs) from each ADZs to give 8 LGAs. In the third stage, 2 communities were selected from each of the local government areas to give 16 communities. In the last stage, 30% of the total population of the young agricultural entrepreneurs from each community were selected using random sampling technique to give 300 respondents who were interviewed for this study. Primary data used for the study were collected through the administration of structured questionnaires. Data collected include socioeconomic characteristics of respondents, production activities of respondents, effects of COVID-19 on their agricultural businesses and strategies adopted to mitigate these effects. The dependent variable of the study was the effects of COVID-19 and was measured using a 3-point Likert-type scale with response categories not serious effect assigned a score 1, serious effect assigned a score 2 and very serious effect assigned a score of 3, based on the respondents' responses to the 12 effects of COVID-19 identified and listed. Effects of COVID-19 with mean score less than or equal to 2 were categorised as very mild effects while those with mean scores greater than 2 were categorised as very strong effects.

Production activities of respondents was measured using a 3-point Likert type scale with response options: low (1), moderate (2) and high (3) on a number of identified agricultural production activities which include: land preparation, planting activities, fertilizer application, weed control, harvesting, brooding, rearing, fattening and breeding, processing and marketing. Frequency counts and percentages were employed to describe the socioeconomic characteristics of respondents and strategies adopted to cope with COVID-19 in the area.

RESULTS AND DISCUSSION

Socioeconomic characteristics

Table 1 shows that 90.0% were male, while 10.0% were female, implying that agricultural production enterprises in the State is male dominated. To corroborate the findings of this study, Mgbanya, Eze, Amuta and Igwe (2019) and Sinah (2019) reported that 65.8% and 57.5% of their respondents were male, respectively. The mean age of respondents was 33.6 years indicating that respondents are still young. This is in conformity with the a-priori expectation. This youthful age should position the respondents to be active agricultural business managers. Mgbanya, Eze, Amuta and Igwe (2019), reported similar age as the age when most farmers are actively engaged in agricultural production. The findings of Sinah (2019) and Reddy and Sundaram (2022) were slightly different from the findings of this study. While Sinah, (2019) reported that most (45%) of the respondents in his study were over 50 years old, Reddy and Sundaram (2022) reported the average age of the respondents in their study as 26.7 years. The result further reveals that 80% of the respondents were married while 20% were single. This indicates that majority of the respondents are married. Marriage is expected to confer on the respondents, the responsibilities to operate agricultural business more profitably, because it is believed that married farmers usually have more needs than the single. Hence, they would be willing to be more commitment in the operation of their agricultural businesses Mgbanya, *et al.* (2019) and Sinah (2019) also reported in their findings that majority of the farmers in their studies were married. Result shows that 20% of the respondents had primary school education, 50% had secondary school education, while 30% had tertiary education. This shows that majority (80%) are educated above primary school level. This is expected to influence their access to agricultural production information, that when properly utilized; will impact their production output positively. The mean years of farming experience, according to the result was 12.2 years. This is an indication that respondents had appreciable years of experience in farming business and should have acquired enough agribusiness experience to excel in their chosen agricultural enterprises. Sixty five percent of respondents in the study of Sinah (2019) had between 1 to 10 years of farming experience. These years of farming experience are considered reasonable enough to position them for increased output of various crops cultivated. The mean household size was 8 persons, an indication that respondents had relatively good number of people in their households that could provide labour required at all stages of production. The mean household size reported by Mgbanya, *et al.* (2019) was 7 person which is which is similar to the result of this study. The table also reveals that

50% were engaged in crop production solely, 20% engaged in livestock production solely, while 30% engaged in integrated production of crops and

livestock. This shows the popularity of various farming systems in the area.

Table 1: distribution of the respondents by socio-economic characteristics (n=300)

Characteristics	Frequency	Percentage	Mean
Sex			
Male	270	90.0	
Female	30	10.0	
Age			
20-30	95	31.7	
31-40	165	55.0	
41-50	40	13.3	33.6
Marital Status			
Married	240	80.0	
Single	60	20.0	
Educational Qualification			
Primary	60	20.0	
Secondary	150	50.0	
Tertiary	90	30.0	
Years of farming			
10-15	175	58.3	
16-20	105	35.0	
21-25	20	6.7	12.2
Household size			
1-5	78	26.0	
6-10	152	50.7	
11-15	70	23.3	7.8
Major enterprise type			
Crops	150	50.0	
Livestock	60	20.0	
Crops and livestock	90	30.0	

Source: Field survey, 2020

Production activities of respondents (n=300)

Results in Table 2 show that activities such as land preparation (69.0%), planting (75.0%), weed control (65.0%) as well as fattening and breeding (19.0%) were moderately engaged in by respondents. Fertiliser application (70.0%) as shown in the table may fall into low category of level of production activities, due probably to either non availability or high cost of the input during COVID-19. Low level of fertiliser application may drastically reduce crops yield and consequently affect the level of income of the respondents. The level of brooding (28.0%), rearing (25.0%), processing (78.0%) and marketing (70.0%) activities was high. This may be due to the perceived importance of the activities to the success of both livestock and crops enterprises. It could also be because respondents were able to carry out these production activities more easily in their homes and were therefore able to overcome all obstacles to production activities presented by restriction on movement of people during COVID-19. These findings were corroborated by the findings of Chukwuemeka and Mma (2020) and Daniel, Christopher, Andres and Haoyu (2020) who deduced that production activities of most

entrepreneur, particularly the youths in SSA would be slowed down due to the scourge of COVID-19.

Effects of COVID-19 on respondents

Results in Table 3 show that 72.0% of respondents experienced very serious effect of COVID-19 on demand for their goods and services. Sixty two percent, 53.0%, 60.0% and 62.0% also experienced very serious effect on their access to production inputs, cost of production, farm income and ability to meet domestic needs, respectively. This is an indication that respondents were actually hit by the scourge of COVID-19. The effect of COVID-19 on access to production inputs among the respondents will have serious multiplier effect on their activities. It will therefore limit the respondents' ability to scale up their production activities, increase their yields and output and negatively affect their productivity. Few, (40.0%) and 49.0% experienced serious effect on marketing and processing and transportation cost, respectively while 74.0% experienced serious effect on access to farmland. The observed effect on transportation cost and access to farmland may be due to measures globally adopted to mitigate the effect of COVID-19. This will however affect production



performance of the respondents. Respondents may not either break even or have reduced profit from their production activities. Identifying and adopting timely and effective containment measure against COVID-19 must therefore be seriously considered to sustainably mitigate the impact of COVID-19 and

afford the respondents opportunities for sustainable production activities. The findings of this study is corroborated by the report of FAO (2020b). According to FAO (2020b), COVID-19 negatively impacted household food security, demand for goods and services as well as to production inputs

Table 2: Production activities of respondents

Production activities	Low	Moderate	High
Land preparation	19.5	69.0	11.5
Planting	14.7	75.0	10.3
Fertilizer application	70.1	10.8	19.1
Weed control	6.8	65.2	28.0
Harvesting	12.8	10.2	77.0
Brooding	66	0.6	28.0
Rearing	70.1	4.9	25.0
Fattening and breeding	65.4	19.1	15.5
Processing	13.9	10.1	76.0
Marketing	10.5	18.5	70.0

Source: Field survey, 2020

Table 3: Effects of COVID-19 on respondents

Effects of COVID-19	Percentages		
	Not serious	Serious	Very serious
Demand for goods and services	8.0	20.0	72.0
Access to input	16.0	22.0	62.0
Cost of production	17.0	30.0	53.0
Marketing and processing	50.0	40.0	10.0
Transportation cost	38.0	49.0	13.0
Household food insecurity/profit margin	10.0	78.0	12.0
Farm income	2.0	38.0	60.0
Ability to meet domestic needs	15.0	23.0	62.0
Closure of enterprise	30.0	45.0	25.0
Access to farmland	22.0	74.0	4.0
Access to labour	16.0	52.0	32.0
Attendance at training	13.0	75.0	12.0

Source: Field survey, 2020

Strategies adopted by the respondents to mitigate effects of COVID-19

According to results in Table 4, 56.0% of respondents maintained regular contact with their customers using Facebook, 55.0% employed Instagram, Twitter users accounted for 65.0% of the respondents, while 70.0% of the respondents used WhatsApp. This was deemed possible probably because respondents were adjudged to be relatively educated, to have good understanding of the use of social media handles and to have access to them.

The scourge of COVID-19, according to the respondents, had improved their adaptation ability. Most of the respondents (60.0%), reported to have cultivated land close to their residence that were hitherto left uncultivated to make up for loss of uncultivated farmland due to restriction on movement. Some (45.0%) of the respondents adopted the use of animal dung as feasible substitute to inorganic fertilizer. Use of animal dung might have been considered as viable option to the use of

inorganic fertiliser by the respondents because of its availability and high cost of inorganic fertiliser due to restriction of movement. Some (15.0%) developed alternative feed for their livestock while about 37.0% switched over to the use of soaked neem tree's leaves as valid alternative to inorganic pesticides. The adoption and use of soaked neem trees as pesticide by respondents may be due to the availability of neem trees in the area, the ease of production of the neem solution and its little or no residual effect on both crops and livestock. Respondents also adopted processing and value addition techniques to curtail the effects of COVID-19. Few of the respondents (30.0%), who were into livestock enterprises embarked pro-actively on processing of their poultry products to improve their storage-ability and monetary value.

Some of the respondents (55.0%), who specialised in crop production left their crops on the field to dry to optimum moisture content as opposed to selling fresh to would-be buyers. This is expected

to reduce cost of processing and overall cost of crop production. Sixty two percent of the respondents decided to pasteurize their vegetables like tomatoes, pepper and onion to increase the crop's shelf life and attract better monetary value. Measures employed globally to prevent the spread of COVID-19 provided opportunity for majority of the respondents

to diversify their businesses and earn extra income from multiple sources. Few (32%) explored the opportunities presented by the scourge of COVID-19 to diversify into the sales of face mask and face shield, 45% diversified into the sale of hand sanitizer while about 51% were involved in the production of liquid soap.

Table 4: Distribution of respondents by adaptation strategies adopted to mitigate effects of COVID-19

Adaptation strategies adopted by respondents	Frequency	Percentage
Use of Face Book	168	56.0
Use of Instagram	165	55.0
Use of Twitter	195	65.0
Use of WhatsApp	210	70.0
Cultivation of abandoned farmland	180	60.0
Use of animal dung	135	45.0
Use of alternative livestock feed	45	15.0
Use of alternative pesticides	111	37.0
Processing of livestock products	90	30.0
Drying of crops in field	165	55.0
Pasteurisation of vegetables	186	62.0
Diversified into sales of face mask	96	32.0
Diversified into sales of hand sanitizer	135	45.0
Diversified into production of liquid soap	153	51.0

Source: Field survey, 2020

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of this study, it was concluded that respondents in the study area were hit by containment measures adopted to prevent the global spread of COVID-19. Despite the effect of COVID-19 on the respondents, coping strategies were developed to mitigate the effects, respond to COVID-19 and adapt to possible future epidemics. The study recommended therefore that the Kaduna State Government through the Kaduna Agricultural Development Agency training and intervention programme should provide adequate support in form of credit, quality and subsidized inputs as well as useful agricultural businesses information to the trained agripreneurs. This should be done to further prevent food insecurity, curtail the scourge of COVID-19 and other possible future epidemics; and productively engage youths.

REFERENCES

Chukwuemeka, U. and Mma, A. E. (2020). Understanding the impact of the COVID-19 outbreak on the Nigerian economy. <https://www.brookings.edu/blog/africa-in-focus/2020/04/08/understanding-the-impact-of-the-covid-19-outbreak-on-the-nigerian-economy/>. Accessed on 2 August 2021

Daniel, G. M., Christopher, L., Andres, C. A., and Haoyu, W. (2020). The impact of COVID-19 (Coronavirus) on global poverty: Why Sub-Saharan Africa might be the region hardest hit. <https://blogs.worldbank.org/opendata/imp>

act-covid-19-coronavirus-global-poverty-why-sub-saharan-africa-might-be-region-hardest. Accessed on 2 August 2021.

Food and Agriculture Organisation (2020a). COVID-19 response: inclusion of rural youth in Sub-Saharan Africa. Text by Pozarny, P. Nsanganira, T. & Carlucci, J. In: *FAO Support to investment* [online]. Rome. [Cited 8 July 2020]. <http://www.fao.org/support-to-investment/news/detail/en/c/1275405/>. Accessed on 2 August 2021.

Food and Agriculture Organisation (2020b). *Impact of COVID-19 on informal workers*. Rome. (Also available at <https://doi.org/10.4060/ca8560en>). Accessed on 2 August 2021.

Frank, H. and Massoud, H. (2020). COVID-19 effects in sub-Saharan Africa and what local industry and governments can do. <https://www.unido.org/news/covid-19-effects-sub-saharan-africa-and-what-local-industry-and-governments-can-do>. Accessed on 2 August 2021

Mgbanya, J. C., Eze, A. V., Amuta, L. A., and Igwe, E. O. (2019). Effect of Socioeconomic Characteristics of Youth Farmers on the Rice Production Project in Ishielu Local Government Area of Ebonyi State, Nigeria. *Direct Research Journal of Agriculture and Food Science*. 7(4):70-76

Reddy, S. S. and Sundaram, N. (2022). Analysis of Socioeconomic Status of young migrant farmers in India using probit regression.



*Economic Research - Ekonomska
Istrazivanja*, DOI:
10.1080/1331677X.2022.2106267
Sinah, M. Modirwa (2019). Effects of Farmers'
Socioeconomic Characteristics on Access
to Agricultural Information in Ngaka
Modiri Molema District of the Northwest

Province *International Journal of
Agricultural Extension*. 7(1):1-7
World Health Organisation (2020). *Coronavirus
disease (COVID-19) advice for the public*.
from
[https://www.who.int/emergencies/diseases
/novel-coronavirus-2019/advice-for
public/](https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/). Retrieved August 21, 2020

NEEDS ASSESSMENT OF YOUTHS INVOLVED IN FISH FARMING IN IBADAN METROPOLIS, OYO STATE, NIGERIA

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ABSTRACT

This study examined the needs assessment of youths involved in fish farming in Ibadan Metropolis, Oyo State, Nigeria. A multi-stage sampling procedure was used to select 100 youths that were involved in fish farming in the study area. Specific objectives like personal characteristics, enterprise characteristics, accessibility to factors of production, level of involvement in fish farming, constraints to involvement in fish farming and needs towards fish farming were assessed. Data were analysed using frequencies, percentages, mean, Chi-square and Pearson Product Moment Correlation. Results of the study showed that the mean age of respondents was 25.8 ± 6 years and 79.0% were male. About sixty percent of respondents raised both catfish and tilapia and the years of experience of respondents was 4.8 ± 5.0 years. The result further showed that 53.0% of respondent had low access to factors of production and the level of involvement in fish farming activities was high (60.0%). Constraints to involvement in fish farming were weather conditions ($\bar{x} = 1.52$), high cost of inputs ($\bar{x} = 1.49$) and high cost of feeds ($\bar{x} = 1.48$). The needs of respondents were technical ($\bar{x} = 29.97$), information ($\bar{x} = 27.10$) and agro-service ($\bar{x} = 30.64$) needs with agro-service being the major need. Chi-square result showed that scale of business ($X^2 = 0.527$, $p = 0.004$) was significantly related to the needs of respondents. Also, respondents' accessibility to factors of production ($r = 0.328$, $p = 0.001$) was significantly related to their needs. The study recommended that government at all levels should provide agro-services to fish farmers and make agriculture a business that is attractive so as to encourage youths to stay in the enterprise and achieve food security in the nation.

Keywords: Agro-service, Constraints, Fish farming, Food security, Involvement, Needs

INTRODUCTION

Aquaculture is one of the fastest growing sub-sector of agriculture with great potentials. It is defined as the artificial rearing of fish in an enclosed and fairly shallow body of water where all its life processes can be controlled (FAO, 2021). It is a means of contributing to the food security of the nation directly by producing fish for food and indirectly by generating employment for the teeming unemployed populace (Ifeonu, Chukwuemeka and Agwu, 2019). Fish is nutritious, a good source of protein, low in cholesterol and calories level and also an important revenue earning enterprise in Nigeria (Balami, Sharma and Karn, 2019) especially at such a time when the nation seeks to diversify its productive base from total dependence on oil sector to other sectors like agriculture (Owan, Ndibe and Anyanwu, 2020).

According to Naylor, Hardy and Buschmann, *et al* (2021), the global aquaculture production has tripled over the past twenty years in live-weight volume from 34Mt in 1997 to 112Mt in 2017. The growth of aquaculture industry is caused by the expansion in global trades, competitive product pricing, rising incomes and urbanisation all of which contribute to rising per capita consumption of seafood worldwide. For instance, the contribution of the fisheries sub-sector to the Gross Domestic Product (GDP) figure in Nigeria which was 1.1% in 1995 increased to 3.2% in 2007 and 5% in 2020 (Oluwatayo and Adedeji, 2019). The need to actively pursue the development of fisheries sub-sector in order to cope with the rising demand for fish and fish products and also to diversify the oil-based economy of Nigeria becomes imperative. This is important so as to achieve self-sufficiency in fish

and food production and ultimately to have fish products available for export (Adeleke, Robertson-Andersson, Moodley and Taylor, 2020).

However, despite the growth in the fishery sub-sector, there is no sufficient increase in supply to meet up with the demand. According to Oluwatayo and Adedeji (2019), more than 80 percent of Nigeria's total domestic production is generated by small-scale fishers from coastal and inshore of the Niger-delta, lagoons and lakes. Fish demand in Nigeria is presently put at about 2.66 million metric tonnes per annum and the total domestic fish production can only supply 800,000 metric tonnes, leaving a shortfall of 1.2 million metric tonnes of fish annually. Therefore in order to meet the local demand, government imports 1.90 million metric tonnes of fish worth of N125 billion annually (Olaoye and Ojebiyi, 2018), which is a mere waste of resources. Nigeria has large natural resources to support aquaculture development: inland freshwater of 14 million hectares and available land area of 1.7 million hectares for the aquaculture development. Although production in the country is largely based on small-scale operations and the use of traditional fishing methods in most parts, there is a wide consensus that fish farming has the potentials to meet the growing demand for nutrition as it contributes to growth of the economy and supports the sustainable livelihoods of many communities especially in the rural parts of the country (Olaoye and Ojebiyi, 2018).

The contribution of aquaculture as part of agricultural sector to economic growth and poverty reduction cannot be overemphasized as it is also a viable solution in tackling the rising youth



unemployment in Nigeria. However, the state of the sector is worrisome as it is being left in the hands of ageing and subsistent farmers with several challenges to be solved, this is resulting into low production. Maximum production that will meet the demands of ever-increasing population can be achieved when agile youths are integrated into the system. Nigerian youths have desirable qualities such as curiosity and activeness that can promote aquaculture sector. Despite this, it is widely known that young people are increasingly moving away from agriculture as a source of livelihood to white collar jobs and other means of economic survival (Arulingam, Nigussie, Senaratna and Debevec, 2019).

In order to cultivate interest of youth in fish farming, promotion of aquaculture products will provide opportunities for young entrepreneurs to get ideas, create new products and influence the interest of youths to ensure sustained involvement in fish farming and other agricultural related ventures. There is no doubt that youths involved in fish farming are few even as the rate of unemployment keeps increasing which could be as a result of some challenges and needs hindering their full participation in the sector. This study therefore assessed the needs of youths involved in fish farming so as to overcome challenges faced in the industry which when solved will motivate other youths to be part of the industry.

The general objective of this study was to assess the needs of youths involved in fish farming in Ibadan metropolis of Oyo State, Nigeria. The specific objectives are to:

1. describe the personal characteristics of respondents;
2. describe the enterprise characteristics of respondents;
3. determine respondents' accessibility to factors of production;
4. evaluate the level of involvement of respondents in fish farming activities;
5. identify constraints to involvement in fish farming and
6. assess respondents' needs towards fish farming.

The hypotheses of the study were stated as follows:

H₀₁: There is no significant relationship between the respondents' enterprise characteristics and their needs.

H₀₂: There is no significant relationship between the respondents' accessibility to factors of production and their needs.

METHODOLOGY

The study area is Ibadan. Ibadan is the capital and most populous city in Oyo State with a population of over 3 million. It is the country's largest city in terms of geographical area co-

ordinates of 7°23'47"N 3°55'0E/7.39639°N 3.91667°E. The city and its environs is home to several industries such as agro-allied, textile, food processing, health care and fish production etc. The city of Ibadan is naturally surrounded by four rivers with many tributaries: Ona, Ogbere, Ogunpa and Kudeti River in the central part of the metropolis.

The population of the study consisted of youths between the ages of 18 and 35 years involved in fish farming in Ibadan metropolis.

This study employed multi-stage sampling procedure for the selection of respondents for this study. At the first stage, two Local Government Areas (LGAs) were purposively selected from the eleven LGAs in Ibadan metropolis i.e. Oluyole and Ibadan south west LGAs because of the prevalence of fish farmers in the areas.

At the second stage, 20% of the wards in each LGA were purposively selected due to the level of fish farming activities making 2 wards from both Oluyole and Ibadan Southwest which are Ikereku and Odo ona from Oluyole and ward 2 and ward 6 from Ibadan south west.

At the third stage, one community each notable for fish farming was purposively selected from each ward making 4 communities: Gege, Isale-osi, Ayegun and Latunde. Snowball technique was used to compile a list of fish farmers from the 4 communities. 50% of the list of fish farmers in each community were randomly selected: Gege (21), Isale-osi (24), Ayegun (26) and Latunde (29) giving a total of 100 fish farmers that formed the sample size for this study.

The dependent variable for this study is needs assessment. Respondents' needs were assessed on Agro-service needs, information needs and technical needs with respect to the different activities that are peculiar to each needs like input purchases, specie selection, fish stocking, feed production, water treatment, harvesting, among others. This was measured on a three point Likert-type scale of not in need (0), slightly in need (1) and seriously in need (2). Mean score was generated for each need and used to identify the most severe of all the three needs.

Data were collected through a well-structured questionnaire on the objectives of the study and analysed using descriptive (frequencies, percentages and mean) and inferential statistics (Pearson product moment correlation (PPMC) and Chi-square) were used in testing the hypotheses with the aid of Statistical Package of Social Sciences (SPSS).

RESULTS AND DISCUSSION

Personal characteristics

The age distribution presented in Table 1 reveals that the mean age of respondents was 25.8±6 years indicating that the respondents are still in their active and productive age. This suggests that there is

better future for fish farming enterprise as it can be sustainably practiced by the youths. This is corroborated by Adelodun, Bankole, Rafiu, Morawo and Ajao (2016) that sustainability of fish venture which is highly profitable is dependent on the effective participation of the younger generations. Results in Table 1 also showed that 79.0% of the respondents were male, this implies that fish farming is dominated by male. This is in tandem with the findings of Olaoye and Ojebiyi (2018) that

fisheries activities are mostly dominated by the male folks. Table 1 further reveals that 98.0% of respondents had formal education ranging from primary to tertiary education. This finding agrees with the results of Ifeonu, Chukwuemeka and Agwu, (2019) that most youths who are engage in fish farming are educated. The result in Table 1 shows that the mean household size of the respondents was 2 ± 2.4 persons which implies less dependants on the respondents.

Table 1: Distribution of respondents by personal characteristics

Variables	Percentage	Mean	SD
Age			
17-22	31.0	25.8	6
23-28	41.0		
29-34	17.0		
35-40	11.0		
Sex			
Male	79.0		
Female	21.0		
Level of education			
No formal education	2.0		
Primary education	1.0		
Secondary education	7.0		
Tertiary education	90.0		
Household size			
1-2	62.0	2.4	2
3-4	17.0		

Enterprise characteristics

The result in Table 2 show that the mean annual income of respondents was ₦458,424±380,424. This suggests that fish farming could sustain livelihood of farmers when provided with adequate resources and inputs. Results from Table 2 revealed the mean for years of experience as 5.0 ± 4.8 years. This shows that majority of the respondents were new in fish farming. Experience of youths in fish farming have positive influence on fish production (Adelodun, Bankole, Rafiu, Morawo, and Ajao, 2016). As revealed in Table 2, more than half (59.0%) of the respondents raised catfish and tilapia. This result disagrees with the findings of Ifeonu, Chukwuemeka and Agwu, (2019) that monoculture was the major type of fish practice among youths. Results from Table 2 also shows that 51.0%, 45.0% and 14.0% of the respondents were operating fish farming on a medium, large and small scale production, respectively. The scale of production could be attributed to availability of resources and the ease at which the respondents can access them. Majority

(94.0%) of respondents used between 1-10 ponds for production with an average of 5 ± 10 ponds. The number of ponds used determines the volume and scale of production as corroborated by Ifeonu, Chukwuemeka and Agwu, (2019).

Accessibility to factors of production

The result from Table 3 revealed that most accessible factors of production are good quality water ($\bar{x} = 1.55$), fish feeds ($\bar{x} = 1.46$), fish seeds and land space ($\bar{x} = 1.43$), among others. However, skilled manpower and start-up capital were among the factors that were not accessible by respondents. Table 4 further shows low (53.0%) level of accessibility to factors of production. This implies that respondents will not be able to produce optimally as access to factors of production determines the level of production and profit that will be generated. This is in line with the findings of Gumel (2017) that access to factors of production is key to maximum production.

**Table 2. Distribution of respondents by enterprise characteristics**

Variables	Percentage	Mean	SD
Annual income (₦)		458,424	380,424
30,000-410,424	48.0		
410,425-790,849	33.0		
790,850-1,171,274	16.0		
1,171,275-1,551,689	2.0		
2,312,547-2,500,000	1.0		
Years of fish farming experience		5.0	4.8
1-5	74.0		
6-10	19.0		
11-15	5.0		
Above 15	2.0		
Type of fish reared			
Catfish only	35.0		
Tilapia only	6.0		
Catfish and tilapia	59.0		
Type of pond used			
Earthen pond	75.0		
Flow through	11.0		
Tank	14.0		
Scale of business			
Small scale	14.0		
Medium scale	51.0		
Large scale	35.0		
Number of pond		4.5	10
1-10	94.0		
11-20	3.0		
21-30	2.0		
31-40	0.0		
41-50	1.0		

Source: Field survey, 2020

Table 3: Distribution of respondents based on accessibility to factors of production

Factors	Accessible (%)	Fairly accessible (%)	Inaccessible (%)	Mean	Rank
Good quality water	60.0	35.0	5.0	1.55	1st
Fish feeds	57.0	32.0	11.0	1.46	2nd
Fish seeds	53.0	37.0	10.0	1.43	3rd
Land space	58.0	27.0	15.0	1.43	3rd
Favourable location for ponds	52.0	27.0	21.0	1.31	5th
Start-up capital	49.0	21.0	30.0	1.19	6th
Credit facilities	45.0	20.0	35.0	1.10	7th
Skilled manpower	30.0	23.0	47.0	0.83	8th

Source: Field survey, 2020

Table 4: Level of accessibility to factors of production

Level of accessibility	Frequency	Percentage	Minimum	Maximum	Mean	SD
Low (0-18.1)	53	53.0	0	24.0	18.2	4.7
High (18.2-24.0)	47	47.0				
Total	100	100.0				

Source: Field survey, 2020

Constraints to involvement in fish farming

The result in Table 5 shows that the major constraints to involvement in fish farming were

weather conditions ($\bar{x} = 1.52$), high cost of inputs ($\bar{x} = 1.49$) and high cost of feeds ($\bar{x} = 1.48$), poor source of fingerlings ($\bar{x} = 1.30$), among others. This

implies that provision and availability of inputs from good and viable source will ensure involvement of youths in fish farming. Most of these constraints were also highlighted in the result of Arulingam,

Nigussie, Senaratna and Debevec (2019) that they influence fish farming operations and serve as hindrance to effective production and profit maximization.

Table 5: Distribution of respondents on constraints to involvement in fish farming

Constraints	Severe constraint	Mild constraint	Not a constraint	Mean	Rank
Weather conditions	60.0	32.0	8.0	1.52	1st
High cost of inputs	55.0	39.0	6.0	1.49	2nd
High cost of feeds	51.0	46.0	3.0	1.48	3 rd
Poor extension services	50.0	45.0	5.0	1.45	4th
Poor source of fingerlings	47.0	36.0	17.0	1.30	5th
Unavailability of land	42.0	45.0	13.0	1.29	6th
Insufficient information	36.0	52.0	12.0	1.24	7th
Water quality maintenance	40.0	41.0	19.0	1.21	8th
Poor processing facilities	36.0	46.0	18.0	1.18	9 th
Inadequate breed of fish	34.0	41.0	25.0	1.09	10th
Waste treatment and disposal	34.0	37.0	29.0	1.05	11th

Involvement in fish farming activities

Table 6 revealed that input purchases ($\bar{x} = 1.75$) and specie selection ($\bar{x} = 1.74$) were the major activities that respondents were involved in under pre-production activities. Also, for production activities, respondents were always involved in fish stocking ($\bar{x} = 1.87$), feeding ($\bar{x} = 1.49$) and general management ($\bar{x} = 1.49$). In post-production activities, respondents were always involved in packaging ($\bar{x} = 1.96$) and selling/marketing ($\bar{x} = 1.93$). This suggests that most of the respondents did not engage the use of hired

labourers on their farm probably due to extra cost that will be accrued to their production cost or their desire to learn more about various activities in fish farming.

The level of involvement of youths in fish farming was high (60.0%) as shown in Table 7 which implies that youths are now embracing fish farming probably due to unemployment and need to make ends meet. This negates the findings of Tsojon, Gidado and Asogwa (2017) that very few young people are involved in fish farming with negative attitude towards the occupation.

Table 6: Involvement in fish farming activities

Operations	Always involved	Sometimes involved	Never involved	Mean	Rank
Pre-production					
Input purchases	75.0	25.0	0	1.75	1 st
Specie selection	74.0	26.0	0	1.74	2 nd
Liming of pond	72.0	28.0	0	1.72	3 rd
Production					
Fish stocking	89.0	11.0	0	1.89	1 st
General management	90.0	7.0	3.0	1.87	2 nd
Feed production	72.0	24.0	4.0	1.68	5 th
Feed purchasing	81.0	18.0	1.0	1.80	4 th
Feeding	87.0	12.0	1.0	1.86	3 rd
Medication	58.0	40.0	2.0	1.56	9 th
Spawning	60.0	37.0	3.0	1.57	8 th
Water management	70.0	28.0	2.0	1.68	5 th
Fish sampling	58.0	40.0	2.0	1.56	9 th
Harvesting	66.0	30.0	4.0	1.62	7 th
Post production					
Packaging	96.0	4.0	0	1.96	1st
Marketing	93.0	7.0	0	1.93	2nd
Selling	93.0	7.0	0	1.93	2nd
Grading	92.0	8.0	0	1.92	4th
Weighing	78.0	18.0	4.0	1.74	5 th

Source: Field survey, 2020

**Table 7: Level of involvement in fish farming activities**

Level of involvement	Frequency	Percentage	Minimum	Maximum	Mean	SD
Low (10.0-32.1)	40	40.0	10.0	38.0	32.2	5.1
High (32.2-38.0)	60	60.0				
Total	100	100.0				

Source: Field survey, 2020

Needs assessment in fish farming

From Table 8, the mean value for technical needs is $\bar{x} = 29.97$. Some of the technical needs were identifying right inputs like fingerlings ($\bar{x} = 1.79$), liming of pond ($\bar{x} = 1.70$) and feed production ($\bar{x} = 1.69$). This implies that most youths in fish farming are still learning some of the technical-know-how involved in the enterprise which may affect their level of production. This corroborates the findings of Adelodun (2015) that technicalities, skills and expertise are needed for successful culture of the organism.

Information needs has the mean value of $\bar{x} = 27.10$. Most of the respondents need information on input purchases ($\bar{x} = 1.84$), fish stocking ($\bar{x} = 1.77$) and feed production ($\bar{x} = 1.74$). This implies that most of the respondents need more information on fish farming and its production despite their level of education. This negates the findings of Ifeonu, Chukwumeka and Agwu, 2019 that youths involved in fish farming with high level of formal education could access information through the internet and books which may reduce the level of information that may be needed.

Table 8: Distribution of needs assessment in fish farming

Categories	Grand mean	Mean
a. Technical Needs	$\bar{x} = 29.97$	
Identifying right inputs		1.79
Liming of pond		1.70
Fish stocking		1.64
Feed production		1.69
Feeding		1.79
Right medication		1.62
Spawning		1.48
Water and ponds treatment		1.56
Harvesting		1.61
Grading		1.60
Packaging		1.61
b. Information needs	$\bar{x} = 27.10$	
Input purchases		1.84
How to lime ponds		1.65
Fish stocking		1.77
Feed production		1.74
Right medication		1.68
Spawning		1.59
Water treatment		1.69
Marketing		1.34
Harvesting		1.29
Weighing		1.43
c. Agro-service needs	$\bar{x} = 30.64$	
Input purchases		1.79
Specie selection		1.73
Fish stocking		1.66
Feed production		1.80
Feeding		1.77
Right medications		1.61
Spawning		1.61
Water treatment		1.75
Harvesting		1.61
Packaging		1.43

Source: Field survey, 2020

Agro-service needs has the highest mean (\bar{x} =30.64). Respondents were in need of agro services like input purchases like fingerlings, fertilizers or lime (\bar{x} = 1.79), feeding (\bar{x} = 1.77), water treatment (\bar{x} = 1.75) among others. This implies that respondents are in need of inputs which is germane to achieving maximum production. Comparing the mean of technical (\bar{x} =29.97), information (\bar{x} =27.10) and agro-service needs (\bar{x} =30.64), it is evident that agro-service needs has the highest mean which implies that youths involved in fish farming were in need of agro-services and

inputs. This is in tandem with the findings of Ifeonu, Chukwuemeka and Agwu, 2019 that high cost of feeds, poor source of fingerlings and lack of credit facilities were some of the challenges faced by youths involved in fish farming.

Table 9 also reveals that needs of youths involved in fish farming was high (63.0%) as corroborated by Adedodun (2015) that youths faced several challenges in fish farming. This calls for prompt attention from all stakeholders so as to encourage youths in this sector and help the nation to be more food secured.

Table 9: Level of respondents' needs in fish farming

Level of needs	Frequency	Percentage	Minimum	Maximum	Mean	SD
Low (33.0-87.6)	37	37.0	33.0	104.0	87.7	16.2
High (87.7-104.0)	63	63.0				
Total	100	100.0				

Source: Field survey, 2020

Chi-square result on enterprise characteristics and needs in fish farming

Table 10 indicates that there was a significant relationship between the scale of business and needs of respondents. (X^2 =0.527) This finding suggests that the scale of business involve in, will determine the needs of respondents as

respondents involved in high scale of business may probably have more needs than someone in small scale of business. This supports the report of Gumel (2017) that scale of business determines how entrepreneurs will overcome challenges and needs faced in their enterprise.

Table 10: Respondents' enterprise characteristics and needs in fish farming

Variables	X^2	df	P-value
Secondary occupation	0.527	3	0.486
Scale of business	6.385	2	0.004
Type of pond used	10.430	2	0.435
Type of fish reared	0.245	2	0.885

$P \leq 0.005$

PPMC result on accessibility to factors of production and their needs in fish farming

Result in Table 9 reveals that there was a significant relationship between respondent's accessibility to factors of production and their needs (r =0.328) in fish farming. This implies that the more

accessible respondents are to factors of production, the lower their needs. This is in tandem with the report of Kreneva, Halturina, Larionova, Shvetsov and Tereshina (2015) that access to factors of production limits challenges that could occur in the production system.

Table 10: PPMC result on accessibility to factors of production and needs in fish farming

Variable	r-value	p-value
Accessibility	0.328	0.001

$P \leq 0.005$

CONCLUSION AND RECOMMENDATIONS

The study concluded that respondents were formally educated which helped their involvement in the enterprise. There was low accessibility to factors of production which affected their maximum production and profit. Youths were highly involved in fish farming which reflects high rate of unemployment and the need to shift to other sector of the economy. Major constraints to fish farming were high cost of inputs, cost of feeds and poor extension services. The major need encountered by

youths involved in fish farming was agro-service. The study concluded that youths are venturing into fish farming because it is profitable but not without needs to be tackled. It is recommended that government at all levels should provide agro-services and make agriculture a business that is attractive so as to encourage youths to stay in the enterprise and achieve food security in the nation.



REFERENCES

- Adeleke, B., Andersson, D., Moodley, G., and Taylor, S. (2020). Aquaculture in Africa: A comparative Review of Egypt, Nigeria, Uganda vis-à-vis South Africa, *Reviews in fisheries Science and Aquaculture*, Vol. 29, issue 2, pp. 167-197, <https://doi.org/10.1080/23308249.2020.1795615> on 20th July, 2021.
- Adelodun, O. B., Bankole, A. F., Rafiu, R. A., Morawo, B.O., and Ajao F.S. (2016). Assessment of youths perception towards fish farming in Ibadan Metropolis, *Research Journal of Agriculture and Environmental Management*, Vol. 5, No. 3, pp. 081-085, <http://www.apexjournal.org>.
- Adelodun, O. B. (2015). Participation of Youth in aquaculture, *Journal of Aquaculture, Research and Development*, Vol. 6, No 12, pg. 1-3, doi: 10.4172/2155-9546.1000386 on 5th August, 2021.
- Arulingam, I., Nigussie, L., Senaratna, S. S and Debevec, I. (2019). Youth participation in small scale fisheries, aquaculture and value chains in Africa and the Asia-Pacific. Penang. Malaysia: CGIAR Research Program on Fish Agri- Food Systems. Program Report: FISH-2019-14.
- Balami, S., Sharma, A. and Karn, R. (2019). Significance of Nutritional value of fish for Human Health, *Malaysian Journal of Halal Research*, 2 (2): 32-34, doi: 10.2478/mjhr-2019-0012 on 20th July, 2021.
- Food and Agriculture Organization (FAO), (2021). Country Profile Fact Sheets. In: FAO Fisheries and Aquaculture Department [online]. Rome. Retrieved from <http://www.fao.org/fishery/http://www.fao.org/fishery/facp/NGA/en> on 20th July 2021.
- Gumel, B. I. (2017). Critical challenges facing small business enterprises in Nigeria: A Literature Review, *International Journal of Scientific and Engineering Research*, Vol. 8, No. 8: pp. 796-808.
- Ifeonu, C. F., Chukwuemeka, V., and Agwu, E. A. (2019). Challenges of Youths involved in Fish Farming in the Federal Capital Territory, Abuja, Nigeria, *Journal of Agricultural Extension*, Vol. 23 (3), pp.156-171, <https://dx.doi.org/10.4314/jae.v23i3.14>.
- Naylor, R. L., Hardy, R. W., Buschmann, A., H., Bush, S., R., Dave, H, King, Ling., C, Little, D.C., Lubchenco, J., Shumway, S.E and Troell, M. (2021). A 20- year retrospective review of global aquaculture, *Nature*, 591, 551-563, <https://https://doi.org/10.1038/s41586-021-03308-6> on 20th July, 2021.
- Olaoye, O. J. and Ojebiyi, W. G. (2018). Marine fisheries in Nigeria, A review, doi.10.5772/interchopen.75032.
- Oluwatayo, I. B., Adedeji, T. A. (2019). Comparative analysis of technical efficiency of catfish farms using different technologies in Lagos State, Nigeria: a Data Envelopment Analysis (DEA) approach. *Agric & Food Security*, 8, 8, <https://doi.org/10.1186/s40066-019-0252-2> on 20th July, 2021.
- Owan, V. J., Ndibe, V. C. and Anyanwu, C. C. (2020). Diversification and Economic Growth in Nigeria (1981-2016): An Econometric approach based on Ordinary Least Square (OLS), *European Journal of Sustainable Development Research*, 4 (4), em013, <https://doi.org/10.29333/ejosdr/8285> on 20th July, 2021

CASSAVA FARMERS' ATTITUDE TOWARDS INFORMATION AND COMMUNICATION TECHNOLOGY USAGE IN ODOGBOLU LOCAL GOVERNMENT AREA OF OGUN STATE, NIGERIA

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ABSTRACT

The study was carried out to determine the attitude of cassava farmers towards ICT usage for accessing agricultural information in Ogun State, Nigeria. Multistage sampling procedure was employed in the selection of 120 Cassava farmers for the study. Data were collected from the respondents with the use of an interview schedule. Descriptive statistics (frequency, counts, percentage and means) and Pearson Product Moment Correlation were employed as statistical tools for data analysis. Findings reveal that the majority (76.7%) of the respondents were aged between 41 and 60 years, married (75.0%), attained tertiary education (49.2%) and with an average household size of 5 members. Majority ((89.2%)) of the respondents were aware of various availability of radio and television (70.0%). Most (70.8%) farmers accessed agricultural information on land clearing methods, length of cassava cutting stems (73.3%), fertilizer application rate and method (72.5%) and plant spacing for cassava for optimum yield (60.8%). The majority (55.2%) of the respondents had favourable disposition towards ICT tools usage. Age ($r = -0.201$, $P < 0.05$), household size ($r = 0.352$, $P < 0.05$), farming experience ($r = 0.4822$, $P < 0.05$) and farm size ($r = 0.381$, $P < 0.05$) influenced the attitude of cassava farmers towards ICT usage for accessing agricultural information. Sequel to the findings of the study, it is recommended that adequate awareness should be intensified among cassava farmers and extension organizations should consider the identified information and communication technology tools for agricultural information delivery to sustain favourable attitude toward ICT usage for agricultural information among cassava farmers in the study area.

Keywords: Cassava farmers, ICT tools, Land clearing methods, Agricultural information, ICT usage.

INTRODUCTION

Agriculture is one of the most important sectors in Nigeria economy, providing the main source of livelihood for the majority of Nigerians hence its development depends on the need for relevant and timely information being transferred to farmers. As at 2020, it was estimated that the global cassava production was 291 million Metric Tonnes with Africa producing over 62% of it and Nigeria taking the lead globally with a production of about 59.5 million Metric Tonnes representing about 21% of the global output (PWC, 2020 and FAO, 2018). However, the bulk of these production outputs are in the hands of small-scale farmers who cultivate between 0.5 and 5 hectares of land (Angba and Iton, 2020). Cassava has increasingly gained prominence, industrially, economically, and nutritionally over the years, because of the multi-uses of its starch-rich roots (Olaniyi, Adetumbi, and Adereti, 2013). Cassava has been transformed from being a staple food to a source of income as well with the potential of being valued as a major foreign exchange earner that can impact positively on the economic fortune of Nigeria. Presently, cassava is primarily a product for food, especially in the form of Garri, tapioca and fufu for human consumption. But the crop can be processed into several secondary products for industrial market value. These products include chips, pellets, flour adhesives, alcohol and starch, which are vital raw materials in the livestock feed, alcohol/ethanol, textile, confectionary, wood, food and soft drinks industries..

The vital roles of Information and Communication Technology (ICT) in the agricultural sector cannot be overemphasized. ICT has become a vital tool in our day-to-day activities and information access through ICT makes farmers depend on it for decision-making in the agricultural enterprise (Faloni and Kwagbe, 2018). The adoption of ICT in agriculture remains an ongoing challenge. The economic benefits of ICT deployment in agriculture are enormous. These include better management of farms, dissemination and retrieval of timely information, better and integrated production planning, monitoring and follow up and access to the latest research outputs (Ayim *et al.*, 2022).

The attitudinal disposition of farmers towards ICT usage is very much required in obtaining effective and efficient information as a support tool which would lead to stronger conviction and efficient extension programme planning in changing agri-rural environment (Vanya, 2020).

Cassava farmers need the information to optimize production, like any other agricultural industry. The sector draws upon infinite sources of widely dispersed, locally contextualized knowledge and a considerable body of research materials. It is expected that there should be a flow of knowledge and new information from various sources to cassava farmers. With the emergence of information and communication technology in the world, there is an expectation that knowledge producers would be substantially empowered to channel information to farmers through ICT.



The mainstreaming of ICT in agricultural stakeholder systems could spur economic development and growth by bridging critical knowledge gaps and increasing access to information on improved varieties and other recommended technology for increased production. This is where ICT has an important role to play. The traditional mode of information delivery to farmers by the extension institution is obsolete and time-wasting, hence there is a need to deploy modern technology to facilitate an easy way of information delivery to farmers in Nigeria (Anunobi and Anunobi, 2018). Nevertheless, farmers need to be knowledgeable in the use of modern ICT and form a favourable disposition towards its usage for accessing agricultural information to maximize the potential of ICT in agriculture. Freeman and Fridah, (2017) and Olatinwo *et al* (2022) carried out studies on the use of information and communication technology in accessing agricultural information and the majority of these studies had focused their attention on the roles of ICT in improving agricultural production without due consideration to the attitude of the farmers towards ICT usage. This study therefore, focused on the attitude of cassava farmers and its influence on Information and Communication Technology (ICT) usage for accessing agricultural information.

The specific objectives of the study are to:

- i. describe the socio-economic characteristics of the respondents.
- ii. ascertain the level of awareness of ICTs among the respondents
- iii. identify the ICTs used by the respondents for accessing agricultural information
- iv. ascertain the agricultural information on cassava production accessed through ICT
- v. determine the attitude of the respondents toward ICT usage for agricultural information.

The study posited the hypothesis that there is no significant relationship between selected socio-economic characteristics of cassava farmers and attitude towards Information and Communication Technology usage for accessing agricultural information.

METHODOLOGY

The study was carried out in Odogbolu Local Government Area, Ogun State, Nigeria. It has its headquarters in Odogbolu town. Odogbolu has a population of 127,123 at the 2006 population census. The seasonal average annual rainfall is 161mm and the average temperature between April and June is 32°C during the day and 23°C at night. The population of the study comprised all cassava farmers both male and female in Odogbolu Local Government, Ogun State, Nigeria. A multistage sampling procedure was employed in the selection

of 120 cassava farmers in the study area. In the first stage, random selection of 5 wards out of fifteen (15) wards was made which was followed by random selection of two communities each from the selected wards, making a total of ten communities. The final stage involved random selection of 12 cassava farmers from each community to arrive at a sample size of 120 for the study. Primary data were obtained through a well-structured interview schedule. The dependent variable of the study was attitude of cassava farmers towards Information and Communication Technology usage for accessing agricultural information and was measured on 5 points Likert scale of Strongly Agreed (SA) = 5, Agreed (A) = 4, Undecided (U) = 3, Disagreed (D) = 2, Strongly disagreed (SD) = 1. Twenty attitudinal statements items including equal number of positive and negative statements were provided for the respondents. The maximum and minimum score for an individual respondent was 100 and 20 respectively. The grand mean was used to categorize the respondents into favourable and unfavourable attitudinal dispositions. All mean scores above the grand mean were categorized as percentage of cassava farmers with favourable attitude and those with mean scores less than the grand mean were considered as those with unfavourable attitude towards ICT usage for accessing agricultural information.

Data collected were analysed using descriptive statistics (frequency, counts, percentages and mean) and Pearson Product Moment Correlation (PPMC) was employed as inferential statistics to test the hypothesis.

RESULTS AND DISCUSSION

Socioeconomic characteristics

The majority (69.2%) of the respondents were members of social organizations (Table 1). This indicates that the respondents have social affiliation within their communities for social networks and this may influence their access to agricultural information which may help in improving cassava production in this study area. The majority (75.0%) of the respondents were married, this implies that most of the respondents are socially responsible and would be able to take responsibility for their decisions. As noted by Sriker Reddy *et al* (2020) that the married are actively participate in social matters that could help them develop favourable attitude toward technology that could provide and make information available

The majority (76.7%) of the respondents had an age range between 41 - 60years and the mean age was 48.9 years. This indicates that the majority of the farmers are in their active age, still agile and active in cassava production. In terms of the education of the respondents, it was discovered that the majority (80.8%) had one form of education or

the other. Education is known to influence attitude and uptake of technology.

Table 1 further shows the farming experience of the respondents with 53.0% of the respondents having less or equal to 10 years of farming experience. This implies that the farmers were experienced, and this may help in improving their cassava production.

The household size of the respondents could be considered relatively large as the majority (76.6%) had less or equal to 5 persons in their households, with the mean household size of 5

members. This indicates that the respondents had moderately large household size in this study.

The majority (84.2%) had less or equal to 5 acres of land for cassava production, while others (15.8%) cultivated more than 5 acres of land for cassava production in the study area. This implies that most of the respondents are small-scale producers. This may be attributed to inadequate access to land for cassava production in the study area. The average income of the respondents were N83933.33 with the majority (75.8%) earning less or equal to N100,000 per annum.

Table 1: Distribution of respondents according to their socio-economic characteristics

Socio-economic characteristics	Frequency	Percentage	Mean
Social organization			
Yes	83	69.2	
No	37	30.8	
Marital status			
Single	5	4.2	
Married	90	75.0	
Widow	10	8.3	
Widower	09	7.5	
Divorce	5	4.2	
Separated	1	0.8	
Religion			
Christian	65	54.2	
Islam	55	45.8	
Age (Years)			
≤ 40	15	12.4	
41-60	92	76.7	48.99
Above 60	13	10.8	
Level of education			
Primary education	14	11.7	
Secondary education	15	12.5	
NCE	39	32.5	
Bachelor's degree	20	16.7	
PhD	5	4.2	
Years of farming			
≤ 10	63	52.5	
11-20	36	30.1	13.04
Above 20	21	17.5	
Household size			
≤ 5	94	76.6	
6-10	25	20.8	4.88
> 10	3	9.7	
Farm size (Acres)			
1-5	101	84.2	3.33
Above 5	19	15.8	
Annual income (Naira)			
≤ 50,000	46	38.3	
51,000-100000	45	37.5	83933.33
Above 101,000	28	24.1	

Source: Field Survey, 2021

Awareness of available ICTs tools for accessing agricultural information

The findings in Table 2 indicate that majority (89.2%) of the respondents were aware of radio as an ICT tool followed by mobile phone

(81.7%) and television (70.0%). while a few (24.2%) of the respondents were aware of internet, video (21.7%), online paper (13.3%) and CD-ROM (11.7%). This implies that the majority of the respondents were aware of electronic forms of ICT



especially, Radio, Mobile phones and Television. Pandey (2017) suggested that different ICT communication devices or applications are necessary to educate the farmers. He further stated that the application such as mobile phones can be a great help to farmers in changing their attitude

toward ICT tools. However, Boniface, Jose and Sakeer (2019) reported that awareness of ICT is highly needed by farmers to be able to benefit maximally from the new tools for agricultural information dissemination and retrieval.

Table 2: Distribution of respondents according to awareness of available ICTs tools for accessing agricultural information

ICT Tools	Percentage
Radio	89.2
Television	70.0
Mobile phone	81.7
Video	21.7
Online papers	13.3
Computer	24.2
Internet	23.3
CD ROM	11.7

Source: Field Survey, 2021

Parentheses indicate Percentages ICT tools used for accessing agricultural information

Table 3 shows the most frequently used ICT tool in accessing agricultural information was radio (WMS=1.83) followed by mobile phones (WMS=1.58) and television (WMS=1.51). This indicates that radio, mobile phones and television

were the most frequently used ICT tools by the cassava farmers in the study area. This finding corroborates that of Abbas *et al.*, (2009) who reported that radio is the most frequently used ICT tool by farmers as it is the prominent medium of communication among farmers in Nigeria.

Table 3: Distribution of respondents according to ICT used for accessing agricultural information

ICT tools	Sometime %	Often %	Rarely %	Never %	WMS	Rank
Radio	9.2	73.3	8.3	9.3	1.83	1 st
Mobile phone	23.3	42.5	3.3	30.8	1.58	2 nd
Television	24.2	35.0	7.5	33.3	1.51	3 rd
Online newspaper	3.3	0.8	23.3	72.5	0.49	4 th
Internet	9.2	2.5	10.0	78.3	0.43	5 th
CD ROM	0.0	0.8	7.5	91.7	0.09	6 th

Source: Field Survey, 2021

Agricultural information accessed through ICT

The prominent agricultural information accessed through ICT were information on land clearing methods (70.8%), length of cassava cutting stems (73.3%), fertilizer application rate and method

(72.5%) and plant spacing for cassava for optimum yield (60.8%) as shown in Table 4. This implies that most of the agricultural information accessed is important technical information that can improve the yields of cassava in the study area.

Table 4: Distribution of respondents according to agricultural information accessed through ICT

Agricultural information	Percentage
Land clearing methods	70.8
Length of cassava stems	73.3
Fertilizer application rate and method	72.5
Plant spacing for cassava for optimum yield	60.8
Weed management	30.0
Pest control on cassava farm	35.0
The harvesting time of cassava tubers	20.0
Storage method of cassava	20.8
Marketing price of cassava	9.2
Value addition to cassava produced	8.3

Source: Field Survey, 2021

Parentheses indicate percentages attitude toward ICT usage for accessing agricultural information

The result in Table 4 shows the percentages of responses to attitudinal statements by the respondents. It was revealed that more than half of the respondents strongly agreed or agreed with the attitudinal statements such as ICT tools are not suitable for illiterate farmers (60.8%), timing of agricultural programmes on radio and television as ICT tools are properly scheduled to access agricultural information(58.3%), ICTs are reliable tools for meeting information needs of farmers

(54.2%), ICTs tools keep me abreast of latest technology in agriculture around the world (49.2%), ICTs is a valuable tools for accessing weather information(48.3%) and erratic power supply is a limiting factor to the use of the ICTs (46.7%). This implies that the respondents had favourable attitude towards ICT because it is beneficial to them as indispensable tools for accessing agricultural information. Lokeswart (2016) had earlier posited that favourable attitude towards ICT could enhance its adoption and use among rural farmers.

Table 4: Distribution of respondents according to farmers’ attitude towards ICT usage for accessing agricultural information

Attitudinal Statements	SA	A	U	DA	SD
Erratic power supply is a limiting factor in the use of the ICTs	46.7	20.8	10.0	19.2	3.3
I have sufficient time to access and use ICT for agricultural information retrieval	0.8	32.5	11.7	42.5	12.5
I cannot afford the cost of using ICTs for accessing agricultural information	30.8	46.7	8.3	14.2	0.0
The use of ICTs will not facilitate timely farm inputs delivery	5.0	15.0	60.8	8.3	10.3
The use of ICTs has exposed me to other developmental information	11.7	41.7	30.8	14.2	1.7
ICT tools are not suitable for illiterate farmers	11.7	60.8	14.2	6.7	6.7
Access to ICT facilities alone would not solve farmers problems	22.5	48.3	10.0	10.0	9.2
I don’t need to be educated to use ICTs for accessing agricultural information	2.5	47.5	14.2	18.3	17.5
I cannot understand or interpret weather information from the ICTs	2.5	38.3	5.8	41.7	11.7
The use of the ICTs will increase my farm yield	10.8	18.3	44.2	15.0	11.7
The use of ICTs does not provide me with market information and opportunities	7.5	24.2	38.3	16.7	13.3
The use of ICTs is a distraction from other domestics’ chores	19.2	50.0	4.2	15.8	10.8
ICTs is of no benefit to rural farmers	17.5	15.8	51.7	7.5	7.5
ICTs tools keep me abreast of latest technology in agriculture around the world	20.8	49.2	20.0	5.8	4.2
The use of ICTs updates farmers with government policies on agriculture	25.8	15.0	48.3	10.8	0.0
ICTs is a valuable tool for accessing weather information	10.8	48.3	24.2	10.8	5.8
ICTs are reliable tools for meeting information needs of farmers	26.7	54.2	12.5	6.7	0.0
Use of the ICTs will facilitate timely execution of my farm operations	12.5	19.2	66.7	1.7	0.0
Use of the ICTs interferes with my domestic work	4.2	64.2	8.3	19.2	4.2
The timing of agricultural programmes on radio and television as ICT tools are properly scheduled to access agricultural information	58.3	14.2	3.3	18.4	5.8

SA - Strongly Agreed; A - Agreed; U - Undecided; DA - Disagreed; SD - Strongly Disagreed

It is evident in Figure 1 that more than half (55.2%) of the farmers had favourable attitude towards the use of ICT while the remaining (44.8%)

had unfavourable attitude towards ICT usage for accessing agricultural information. This finding is in line with Akinnagbe and Oladipupo (2018) had

earlier reported favourable attitude of farmers towards ICT usage in Ekiti State. They posited that favourable attitude would have effect on farmers’

productivity and income as well as achieving desirable communication link between farmers and extension agents.

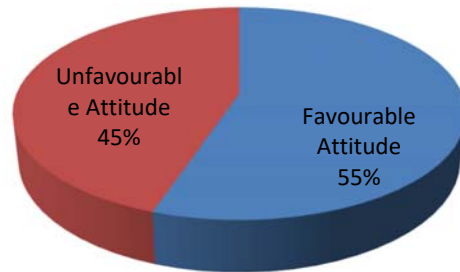


Figure 1: Pie Chart showing Categories of Cassava Farmers’ attitude towards ICT usage

Relationship between selected socio-economic characteristics and the attitude towards ICTs usage

Data presented in Table 5 shows that there were positive and significant relationships between household size ($r = 0.352, p \leq 0.05$), years of farming experience ($r = 0.482, p \leq 0.05$), farm size ($r = 0.381, p \leq 0.05$) and attitude towards ICTs usage for

accessing agricultural information. Conversely, age ($r = -0.201, p \leq 0.05$) shows a negative and significant relationship with attitude towards ICT usage. This implies that household size, farming experience, farm size and age of farmers significantly influenced the attitude of the respondents towards ICT usage for accessing agricultural information.

Table 5: Summary of correlation analysis showing the relationship between selected socio-economic characteristics and the attitude towards ICTs usage

Socio-economic variables	Correlation coefficient	p-value
Age	-0.20	0.02
Household size	0.35	0.00
Farming experience	0.48	0.00
Farm size	0.38	0.00

Source: Field Survey, 2021

CONCLUSION AND RECOMMENDATIONS

The study concluded that the respondents were aware of various ICT tools and the most frequently used ICT tools for accessing agricultural information were radio, mobile phones and television. They had access to technical and economic agricultural information on cassava production such as land clearing methods, length of cassava cutting stems, fertilizer application rate and method and plant spacing for cassava for optimum yield. The respondents exhibited favourable attitudinal dispositions towards ICTs usage. Age, household size, farming experience and farm size influenced the attitude of cassava farmers towards ICT usage for accessing agricultural information. It is recommended that adequate awareness on the use of ICT should be intensified, and agricultural information delivery should be encouraged by the extension organizations through the use of the identified ICT tools used by the farmers in order to sustain favourable attitude among Cassava farmers in the study area

REFERENCES

Angba, C. W. and Iton, O. V (2020). Analysis of Cassava Production in Akpabuyo Local Government Area: An Econometric Investigation Using Farm-Level Data. *Global Journal of Agricultural Research* 8(1): 1-18

Akinagbe, O. M. and Oladipupo, G. T. (2018). Attitudes of Arable Crop Farmers towards the Use of Information Communication Technologies in Ekiti State, Nigeria. *Journal of Agricultural Science and Food Technology* Vol. 4 (9): 182-189

Anunobi, C. P. and Anunobi, C. V. (2018). Improving Rural Farmers’ Access to Information Through ICT-Based Extension Information Services in Nigeria. Paper presented at the IFLA World Library International Conference (WLIC) Malaysia pp 1-11

Ayim, C., Kassahun, K., Addison, C., and Tekinerdogan, B. (2022). Adoption of ICT innovations in the agriculture sector

- in Africa: A review of the literature. *Agriculture and Food Security* 11(22): 1-16
- Boniface, P. J., Jose, A. M. and. Sakeer, H. A. (2019). Constraints Faced by Farmers and Agricultural Extensionists in Using Selected Information Technology Enabled Systems for Agriculture. *Journal of Social Science*. 58(1-3) 7. DOI: 10.31901/24566756.2019/58.1-3.2234
- Faloni, K. B. and Kwagbe, O. P. (2018). Information Communication Technologies and Agricultural Entrepreneurs: Exploring a Nexus. *Journal of Agricultural Economics, Extension & Social Sciences* 1(1): 103 – 108
- FAO (2018). Food outlook-biannual report on global food Markets-November 2018. Rome. 104 pp. License: CC BY-NC-SA 3.0 IGO. <http://www.fao.org/3/ca2320en/CA2320EN.pdf>
- FAOSTAT (2012). Food and Agriculture Organization of the United Nations, Statistics Division. Available at <http://faostat3.fao.org/browse>.
- Freeman, K., and Fridah, M. (2017). ICT Use by Smallholder Farmers in Rural Mozambique: A Case Study of Two Villages in Central Mozambique. *Journal of Rural Social Sciences*, 32(2): Article 1. Available At: <https://egrove.olemiss.edu/jrss/vol32/iss2/1>
- Hammond, J., Fraval, S., Van Etten, J., Suchini, J.G., Mercado, L., Pagella, T., Frelat, R., Lannerstad, M., Douchamps, S., Teufel, N., Valbuena, D., and Van Wijk, M.T., (2016). The Rural Household Multi-Indicator Survey (RHOMIS) for Rapid Characterisation of Households to Inform Climate Smart Agriculture Interventions: description and applications in East Africa and Central America. *Res Agric. agsy*.2016.05.003. <https://doi.org/10.1016/j.agsy.2016.05.003>.
- Lokeswart, K. (2016). A study of the Use of ICT among Rural Farmers. *International Journal of Communication Research* 6 (3): 232-238
- Olaniyi, O. A., Adetumbi, S.I. and Adereti, M.A. (2013) Accessibility and Relevance of Information and Communication Technologies (ICTS) Among Cassava Farmers in Nigeria. *African Journal of Agricultural Research*. 8(35) 4514 – 4522.
- Olatinwo, L. K., Abdulazeez, M. R. and Wahab, M. J. (2022). The Use of Information Communication Technology among Livestock Farmers In Kwara State. *Nigerian Journal of Rural Sociology* 22 (1): 68-73
- Pandey, N., (2017). Role of Information and Communication Technology in agriculture development: A study of Nabarangpur District. *International Journal of Business*, 4(4) 24-35.
- PWC (2020). Harnessing the Economic Potential of Cassava Production in Nigeria: Cassava Report 2020. Retrieved from <https://www.pwc.com/ng/en/assets/pdf/cassava-production-nigeria-report-2020.pdf> pg1- 11
- Sriker Reddy, G., S. Deotale, L and Raut, A. S. (2020). Attitude of Farmers towards Information and Communication Technology. *International Journal of Current Microbiology and applied Sciences* 9(12): 2504-2508. doi: <https://doi.org/10.20546/ijemas.2020.912.29>
- Tata, J. S., and Mcnamara, P. E. (2018). Impact of ICT on agricultural extension service delivery: Evidence from the Catholic relief services SMART skills and farm book project in Kenya. *The Journal of Agricultural Education and Extension*, 24(1), 89–110. <https://doi.org/10.1080/1389224X.2017.1387160>
- Vanya, V. R. (2020). Study about the attitude of farmers towards information and communication technology tools. *International Journal of Advances in Agricultural Science and Technology* (7) 8: 7-12



SOCIAL CAPITAL: A PANACEA FOR FARMERS AND HERDERS CONFLICT MANAGEMENT IN NIGERIA

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ABSTRACT

The study examines how social capital can be used to manage farmers' and herders' conflict in Nigeria. Farmers' and herders' conflict is exacerbated by climate change, disputes over land resources for farming and grazing, blocking of stock routes, and cattle rustling. The conflict has affected both the farmers' and herders' output, posing threat to household and national food security, and depletion of environmental resources. While state efforts towards mitigating the conflict have focused on the formal security networks, the study highlights the need to harness the inherent social capital within conflicting communities as avenues to managing farmers and herders' conflict in Nigeria. This paper uses secondary data sources to examine farmers' and herders' conflicts in Nigeria, the socioeconomic implication, and the role of social capital in managing the conflict. The study shows that social networks in conflicting communities could anticipate and dissipate conflict, given that most of the traditional conflict management approaches that are being used are flawed, hence, the persistence of the problem to escalating dimensions. The study concludes that farmers' and herders' conflict puts rural and national food security at risk and that the existing social structures in the communities should be considered as alternative means of managing farmers and herders conflict in Nigeria. The paper recommends that the dynamics of the social structures of conflicting groups and points of cohesion should be maximized given the implications of conflicts for the livelihoods and environmental sustainability of rural communities in Nigeria.

Keywords: Social capital, Farmers and herders conflict, Social networks, Livelihood sustainability, Environmental sustainability

INTRODUCTION

The need for a sustainable means of livelihood in the face of limited resources has been a trigger for conflict between farmers and herders in different parts of the world. In Nigeria, the conflict between farmers and herders has been a persistent problem with far-reaching implications for socio-economic development. The widespread tussle for land use for agricultural production by the farmers and animal grazing by herders has assumed national concern as it has resulted in the loss of thousands of lives and properties worth millions of naira (Assessment Capacity Projects, ACAPS, 2017; International Crisis Group, 2017).

Conflict is a loss-loss situation for both the farmers and the herders. This is because both parties experience reduction of output in their livelihoods due to the ensuing conflict (Ofem and Inyang, 2014; Suleiman and Ja'afar-Furo, 2010). While several attempts have been made by the government and other development partners to manage the conflict, it has continued to escalate, with new narratives to the dimensions of destruction to lives and properties. Although the root causes of farmers' and herders' conflict are well-understudied (Blench, 2004; Tenuche and Ifatimehin, 2009; Olaniyan, Francis, and Okeke, 2015), the dynamics of the social systems in which they carry out their socioeconomic activities and the social structures that are inherent in the communities remain a major research gap. This is because understanding the social interactions of the conflicting groups will provide avenues for conflict management.

Social capital has been projected as a means of addressing various rural livelihood

problems, however, its potential as a tool for addressing conflict management has not been given serious attention in scholarly writings in Nigeria. This paper, therefore, argues that rural communities in Nigeria have established social networks that can be co-opted in conflict management systems through awareness creation, advocacy, mobilization, etc., to ensure mutual co-existence between farmers and herders.

Hence, the objective of the study is to analyse how social capital can contribute to farmers' and herders' conflict management in Nigeria. The specific objectives include to examine the causes of farmers' and herders' conflict in Nigeria, examine the socio-economic effect of farmers' and herders' conflict in Nigeria, analyse the approaches of the government in managing farmers and herders conflict in Nigeria, and to analyse the role of social capital in managing farmers' and herders' conflict in Nigeria.

The study uses documentary analysis to situate the farmers' and herders' conflict in Nigeria as a manageable social problem within the context of the social networks that exist among conflicting groups and communities. Secondary data sources such as journals, publications, internet sources, media reports, etc. are used for the study.

Causes of Farmers-Herders Conflict in Nigeria

Farmers and herders have coexisted in the past in Nigeria, living in mutual understanding, trading their respective products with each other for economic gain in Nigeria. However, challenges to their socioeconomic survival have over time resulted in a state of intolerance displayed by the

level of damage caused by the ensuing conflicts over land and land resources. Some of the causes of the conflict are highlighted.

1. **Climate Change** - Climate Change is a global phenomenon that is threatening the livelihood of millions of families and seriously affecting the pattern of land use for both arable crop farmers and cattle rearers who depend on land for their livelihood survivals. Apart from the rapid desertification experienced in the northern part of the country due to climate change, a multiplier effect of desertification is the migration of herders, who predominantly occupy the region to the southern part of the country in search of foliage for their animals (Olaniyan, Francis and Okeke, 2015), a situation that is driving confrontations between farmers and herders in Nigeria (Nwosu, 2017). The competition for the limited land and water resources by farmers and herders triggers disputes between the groups (Ofem and Inyang, 2014).
2. **Population Growth** - The increasing population in Nigeria poses a challenge to land for settlements and urbanization, which is fast pushing into areas that were formally used for agricultural purposes and forest reserves. This has resulted in a tussle for land ownership and control. International Crisis Group (2017) reported that the growing population in Nigeria led to more demand for residential areas such that forest reserves are being destroyed for residential purposes. Population growth has also resulted in increased land use for agricultural activities for economic growth thereby contributing to the tussle over the dwindling land resources and resulting in conflict and violence in Nigeria (Blench, 2004; Okoli and Atelhe, 2014).
3. **Breakdown in cultural practices** - The collapse of the traditional conflict management mechanisms is a major contributor to the conflict between farmers and herders in Nigeria. The deterioration of the cultural system is evident in the decline in social cohesion in farming communities, ethnic conflicts and religious intolerance that culminate in disputes between farmers and herders, and conflicts arising from cultural differences (Abass, 2012; Bello, 2013). The collapse in systems where dialogue was previously employed and the corruption of traditional gatekeepers who compromise the cultural heritage of their communities are also contributing to the conflict between farmers and herders in several communities in Nigeria.
4. **A Dysfunctional legal system** - The legal system in Nigeria, which was supposed to be the ultimate point of dispute management, has been ridden with corruption, and political and

ethnic manipulations. The poor performance of the legal system has resulted in situations where warring farmers and herders ignore legal procedures in venting their dissatisfaction. For instance, Tenuche and Ifatimehin (2009) observed that conflicts in Nigeria have been exacerbated by the State's inability to address the indigene and settler phenomenon in the Nigerian constitution. The International Crisis Group (2017) affirmed that the failure of the formal legal system, particularly in situations where crime is allowed to go unpunished has encouraged farmers and herders to take laws into their hands in Nigeria.

Socioeconomic effects of farmers and herders conflict in Nigeria

1. **Loss of livelihoods** - The contributions of farmers and herders to food security in Nigeria are enormous. The Federal Ministry of Agriculture and Rural Development (FMARD, 2016) reported that livestock contributes between 20-30% of the total agricultural production to the Nigerian economy. In the 2019 report of the National Bureau of Statistics (NBS, 2019), agriculture contributed 21.91% to the GDP in 2019. However, the conflict is seriously affecting the livelihoods of millions of rural families in Nigeria, especially with the spate of killings that threatens livelihoods (ACAPs) (2017). These losses mean loss of income and reduced savings for farmers (Ofem and Inyang, 2014) and herders, as the reprisal attacks also lead to the loss of livestock.
2. **Food insecurity** - The growing levels of farmers and herders clashes have continued to pose a growing challenge to food security in the country. Food insecurity is particularly critical in the northern region which is ridden by insurgency, armed bandit attacks, farmers' and herders' clashes and communal clashes, destruction of farmlands, and the rustling of animals. PricewaterCooper's (PwC, 2020) report indicated that an estimated 5 million people in sixteen northern states were affected by food shortages in 2018. Where farmers abandon their farmlands as a result of clashes with herders, the agricultural output from the farmers' fields will be reduced, hence a reduction of harvested produce for marketability (Suleiman and Ja'afar-Furo, 2010). Herders also lose in the ensuing conflict as their cattle are either rustled or killed in the process of clashes. This will ultimately lead to food insecurity and hunger, especially for the rural poor who lack alternative means of livelihood capacities.
3. **Increased Poverty** - Destruction of farmlands and herds of cattle implies a reduction in the socio-economic well-being of the affected



families, thereby exposing them to poverty outcomes. Sulaiman & Ja'afar-Furo (2010) identified increased poverty as one of the effects of farmers' and herders' conflict within and among the conflicting communities. Evidence from NBS (2020) report showed that farmers and herders conflict is a contributor to rural poverty which is as high as 52%, compared to urban poverty which is as low as 18%.

4. **Loss of Lives and Properties** - Several thousands of lives have been lost to farmers and herders conflict in Nigeria, several women widowed, thousands of children orphaned, and properties worth billions of naira destroyed due to the frequent conflicts over land and water resources in conflicting communities. A report by ACAPS (2017) indicated that over 2,000 people were killed as a result of farmers' and herders' conflict with thousands of people displaced in Benue and Kaduna States alone. ACAPS (2017) report also indicated that an estimated 2,500 people were killed nationwide in 2016, which is higher than deaths resulting from the Boko Haram insurgency over the same period.

Approaches to farmers and herders conflict management in Nigeria

The Nigerian government, international partners, civil society groups, faith-based organizations, etc. have intervened in the conflict between farmers and herders over the years. Proactive measures, as well as resolute and conciliatory measures, have also been used to manage these conflicts periodically. Some of the measures of the government are highlighted.

1. **Grazing reserves** - The creation of grazing reserves was one of the earliest attempts to address the challenges of the farmers-herders conflict in Nigeria. Accordingly, a law was created in 1965, the "Northern Region Grazing Reserve Law of 1965". The law was to create corridors for the passage of migrating livestock and 415 grazing reserves throughout Nigeria. However, the failure to properly demarcate the grazing routes and the influence of urbanization, industrialization, and population growth has hindered access and usage of these reserves by herders (International Crisis Group, 2017; Mustapha, 2019).
2. **Introduction of National Commission for Nomadic Education** - The Federal government established the National Commission for Nomadic Education (NCNE) in 1989 through Decree 41, which is presently known as the Nomadic Education Act, Cap No. 20 Laws of the Federation (Mustapha, 2019). The main goal of the programme was to economically and socially integrate nomadic pastoralists into the national life, through the provision of relevant, functional, and mobile basic education and provision of livelihood skills. The programme currently suffers from dilapidated infrastructure and human resource deficits, primarily due to a lack of adequate funding from the federal government, hence its ineffectiveness (Mustapha, 2019).
3. **Comprehensive Livestock Development Plan** - This plan was developed by the Federal Ministry of Agriculture to address the spate of farmers and herders conflict in Nigeria (Mustapha, 2019). The plan was established to review existing programmes on grazing and cattle routes in Nigeria. However, like post-policy measures in Nigeria, implementation of this policy is yet to materialize as a sustainable approach to ending the longstanding farmers and herders conflict in Nigeria.
4. **Security and Legal Action** - The government has responded to the farmers-herders conflict in Nigeria through the deployment of police and army units. Special military operation and the joint task force have also been launched to foster security in affected zones. The Civilian Joint Task Force, for instance, is widely used to curtail the farmers' and herders' conflict and other security challenges in the Northeast and Northwest, respectively. Mobile police forces have also been used to quell clashes in states like Adamawa and other northern states (International Crisis Group, 2017). However, the security efforts have yielded minimal results, especially due to poor public perception and allegations that security officers connive with and abet some of the conflicts between the farmers and herders in Nigeria. The intimidating nature of the courts to farmers, most of whom are non-educated and the inaccessibility of most of the courts to rural communities contribute to the failure of the legal system to manage the ensuing conflict (Means, Josayma, Neilsen, and Viriyasakultorn, 2002).
5. **Organized dialogues** - The federal government has also used dialogue to bring an end to violent conflict between farmers and herders (Mustapha, 2019). Dialogue with concerned stakeholders has been carried out periodically, following clashes between farmers and herders in several states of the federation. The federal government has also set up a 10-man committee to address the conflicts and to come up with a long-term action plan to stem the situation (Mustapha, 2019). This method has also not been very effective because local political leaders have been accused of favouring farmers who they depend on for votes during elections

as herders, who are nomadic, may not be in the communities to support them during elections, a situation that breeds distrust of community leaders as agents of mediation (International Crisis Group, 2017).

Social Capital: A mechanism for farmers-herders' conflict management

While most of the processes of managing the farmers' and herders' conflict create concerns about their effectiveness, alternative approaches to conflict management in Nigeria become imperative. It is because of this gap, that the social networks that exist between the farmers and herders, who have had points of cohesion before the spate of contestations became frequent, have to be looked into, as a panacea for managing farmers' and herders' conflict in Nigeria.

A nexus exists between social capital and conflict management. Aghajanian (2016) noted that conflict results when there is a disintegration of social capital that exists within a group of people. Societies with low features of social capital are characterized by social conflict with implications for socioeconomic livelihoods (Ashenafi, 2016). Social capital contributes to social cohesion or social solidarity within a community and drives stable development as it enhances the socioeconomic activities within a society (Ashenafi, 2016). The application of social capital in managing crisis has proven to be effective even more than state structures, leading to a growing interest in the concept in the field of conflict management (Sanginga, Kamugisha, and Martin, 2007).

Social capital entails values of social ties and bonds (Pretty and Ward, 2001) through norms, rules, trust, and networks (Putnam, 1993). As social networks, social capital enables the participation of members who derive support from one another to enhance their livelihoods. Social capital places emphasis on people and the way they interact with one another and with systems within their communities. It has been applied to a wide range of social issues, including participatory and rural development, and to problems that require group action (Ostrom and Ahn, 2009).

Social structures are set up for the common good of all members of the community and at the communal level, group interaction is an important component, especially for rural dwellers, who are known to interact cross-culturally, religiously, and ethnically. Social networks and connections (including patronage, neighborhoods, and kinship), relations of trust and mutual understanding and support, formal and informal groups, shared values and behaviours, common rules and sanctions, collective representation, mechanisms for participation in decision-making and leadership, etc. are entrenched social groups and processes that describe socio-cultural dynamics in communities.

These social networks can be harnessed to address the social and economic challenges emanating from conflicts between farmers and herders in Nigeria. This is because social capital allows community members to resolve their collective problems by proffering lasting solutions to them (Boyte, 1995; Sirianni & Friedland, 1997).

The opportunities that social capital that is embedded in a rich stock of social networks in the community are enormous. Communities that are endowed with a diverse stock of social networks and civic associations are in a stronger position to confront issues that threaten their collective existence (Varshney, 2008). Social capital is an important factor for rural communities; it facilitates their capacity to organize for development. Varshney (2008) also highlighted a benefit of social networks in conflict resolution, stating that latent communal conflict has few channels for peaceful resolution and periodically descends into violence and that in cities where association memberships overlap and everyday interactions are frequent, conflict is anticipated and dissipated.

Although herdsman are nomadic in practice; they, however, settle in communities where they engage in their livelihoods periodically. While they rear their cattle, they engage with the farmers, who purchase cattle, beef, or milk from them, while the farmers, on the other hand, sell fodders and other food items to the herders. Business linkages of farmers purchasing cattle which the herders fend for on their behalf also exist in several communities in Nigeria. These ties or bonds, between farmers and herders, are indicative of social networks that bind, which if properly explored, could provide insights into points of cohesion that could be leveraged for conflict management. Their grievances can also be identified through their social networks, and solutions proffered.

Where this is done, the collective association will be able to challenge issues that threaten their collective livelihood and existence and resolve issues of dispute amongst them. This becomes a necessary approach, taking cognizance of the fact that farmers and herders have co-existed in Nigeria before the challenging situations of limited resources that presently threaten their collective means of socio-economic livelihood.

Exploring the social capital and structures in conflicting communities for conflict management holds several benefits.

Firstly, communities are more efficient than formal legal structures in the management of conflicts resulting from resource utilization. In the view of Varshney (2008), in communities where association membership overlaps, with frequent daily interactions, conflicts are easily recognized and dissipated.

Secondly, the approach allows for a participatory process where the conflicting groups



are involved in the decision-making process of the identification of the problem and the desired solution. Whiteside, Michael, and Xavier (2005) noted that the adoption of social capital in conflict management is a participatory process that involves a bottom-up approach, unlike the conventional top-bottom approach that characterizes the formal conflict management processes. This implies that to adequately address the farmers' and herders' conflict that is fast eroding the livelihoods of rural households and national food security in Nigeria, the conflicting groups must be seen as critical stakeholders in decisions of conflict management as this will ensure their ownership of decisions reached and the sustainability of peace in the communities.

Thirdly, the approach ensures thrust among conflicting groups as they interact in their social spaces. Friend-Mensah (2004) noted that ending the conflict is not about preventing those who possess guns from using them but rather, improving or rebuilding social capital that exists within a group by ensuring that they trust each other and cooperate most efficiently.

A participatory system of authority where people come together to identify their problems, proffer solutions, and government also acts on such solutions by adopting them as policies point to an important perspective on farmers' and herders' conflict management in Nigeria. Conflicting groups have points of cohesion in the communities, other than the issues that divide them. Hence, given the communal lifestyle of the rural households in Nigeria with a rich array of social networks and associations, these social structures are pivotal to restoring the serene nature that characterized the rural areas before the sharp tussle for resources between farmers and herders became a frequent occurrence. Appropriating the social capital potentials in the conflicting communities will help to enhance social cohesion and curb or manage conflict to the barest minimum. Strong social ties with a mutual understanding of corporate benefits of societal resources will make people more responsive to the welfare of their neighbours.

CONCLUSION AND RECOMMENDATIONS

The practice of community efforts in resolving rural conflict has been widely used in traditional conflict management in societies, before the emergence of complexities of a changing climate and urbanization that paved way for competition over limited resources for farmers and herders' communities in Nigeria. With the extension of the conflict to all parts of the country and the associated loss of lives, livelihood, and properties with an attendant threat to rural livelihood and national food security, harnessing the social capital that is inherent in the rural communities in managing farmers and herders' conflict becomes a veritable alternative in Nigeria.

It is therefore, recommended that:

1. The dynamics of the social structures of conflicting groups and points of cohesion should be identified and explored as avenues for addressing the rising levels of conflict between farmers and herders in Nigeria.
2. Communities that are vulnerable to farmers-herders conflicts need to be adequately sensitized on the need for amicable conflict management for the betterment of all concerned by tapping into the wealth of social ties that bind them, rather than focusing on their points of disagreement.
3. The government should carry out awareness and advocacy should be carried out from the national to community levels, to emphasize the cohesive structures and benefits of the conflicting groups.
4. Conflicting groups should be involved in decision-making aimed at resolving their disagreements at the communal levels, as this will create ownership of any avenue that is explored for managing conflict between farmers and herders in the community.

REFERENCES

- Abass, I. (2012). No retreat no surrender conflict for survival between the Fulani pastoralist and farmers in Northern Nigeria. *European Scientific Journal* 8 (1): 331-346.
- Aghajanian, A. (2012). Social Capital and Conflict. The Institute of Development Studies, University of Sussex. Accessed July 14, 2021, from <https://www.researchgate.net/publication/235443868>
- Ashenafi, T. (2016). *The Role of Social Capital as a Conflict Resolution Mechanism: The Case of Organizations in Methara Town* (Doctoral dissertation, ASTU).
- Assessment Capacity Projects (ACAPS). (March 17, 2017). *Farmer-Fulani Herder Violence in Benue, Kaduna and Plateau States. Thematic Report*. https://www.acaps.org/sites/acaps/files/products/files/20170320_acaps_thematic_report_nigeria_farmers-herders_violence.pdf
- Bello, A.U. (2013). Herdsmen and farmers conflicts in north-eastern Nigeria: Causes, repercussions, and resolutions. *Academic Journal of Interdisciplinary Studies*. <https://www.mcser.org/journal/index.php/ajis/article/view/603>
- Blench, R. (2004): *National Resources Conflict in North-Central Nigeria: A Handbook and Case Studies*. Mallam Dendo Ltd.

- Boyte, H. C. (1995). Beyond deliberation: citizenship as public work. *The Good Society*, 5(2), 15- 19.
- International Crisis Group Africa Report. (2017). *Herders against Farmers: Nigeria's Expanding Deadly Conflict Africa Report*
- Means K, Josayma C, Neilsen E, Viriyasakultorn V. (2002). Community-based forest resource conflict management. A Training package, 1 & 2. Food and Agriculture Organization of the United Nations, FAO-Rome
- Mustapha S. (2019) The Effectiveness of Government Strategies in Resolving Farmers-Herdsmen Conflict in Adamawa State. *International Journal of Research and Innovation in Social Science* 3 (4): 464-470
- National Bureau of Statistics (NBS). (2019). *Nigerian Gross Domestic Product Report Q1 2019*.
- National Bureau of Statistics (NBS). (2020). *2019 Poverty and Inequality in Nigeria: Executive Summary*.
- Nwosu, C. (2017). Between Fulani herdsmen and farmers.
- Ofem, O.O. & Inyang, B. (2014). Livelihood and conflict dimension among crop farmers and Fulani herdsmen in Yakurr Region of Cross River State. *Mediterranean Journal of Social Sciences* 5(8): 512-519.
- Okoli, A.C. & Atelhe, G.A. (2014). Nomads against natives: A political ecology of herder/farmer conflicts in Nasarawa State, Nigeria. *American International Journal of Contemporary Research* 4(2):76-88.
- Olaniyan, A., Francis, M. and Okeke U.U. (2015). The Cattle are Ghanians but the Herders are Strangers: Farmers and Herders Conflict. Expulsion Policy and Pastoralist Question in Agogo, Ghana
- Ostrom, E., & Ahn, T. K. (2009). The meaning of social capital and its link to collective action. *Handbook of social capital: The troika of sociology, political science and economics*, 17-35.
- Pretty, N. Jules and Ward, Hugh. (2001). Social capital and the environment. *World Development*.
- PricewaterCoopers (PwC). (2020). *Responding to the impact of COVID-19 on food security and agriculture in Nigeria*. Retrieved on April 29 2021 from <https://www.pwc.com/ng/en/assets/pdf/impact-covid19-food-security-nigeria.pdf>
- Putnam, R. (1993). The prosperous community: Social capital and public life. *The American prospect*, 13(4).
- Sanginga, P. C., Kamugisha, R. N., & Martin, A. M. (2007). The dynamics of social capital and conflict management in multiple resource regimes: a case of the southwestern highlands of Uganda. *Ecology and Society*, 12 (1).
- Sirianni, C., & Friedland, L. (1997). Civic innovation & American democracy. *Change: The Magazine of Higher Learning*, 29(1), 14-23.
- Sulaiman & M.R. Ja'afar-Furo, (2010). Economic effects of farmer-grazer conflicts in Nigeria: A case study of Bauchi State. *Trends in Agricultural Economics* 3:147-157.
- Tenuche, M.S. & Ifatimehin, O.O. (2009). Resource conflict among farmers and Fulani herdsmen: Implications for resource sustainability: *African Journal of Political Science and International Relations* 3(9):360 – 364
- Varshney, A. (2008). *Ethnic conflict and civic life*. Yale University Press.
- Whiteside, Katherine, Michael Woolcock, and Xavier de Souza Briggs (2005) "Assessing Participatory Development Projects: Integrating the Art of Practice and the Science of Evaluation" Mimeo, Washington, DC: The World Bank



INFLUENCE OF COVID-19 JINGLES ON RURAL DWELLERS' BEHAVIOUR IN OYO STATE, NIGERIA

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ABSTRACT

This study assessed rural dwellers' behaviour because of COVID-19 jingles on mode of transmissions and preventive measures in Oyo state. Multi-stage sampling procedure was used in selecting 256 rural dwellers. Data were collected on respondents' COVID-19 jingles' listenership and listening pattern. Knowledge of, attitude to, practice of and constraints to practicing COVID-19 preventive measures were assessed. Data were gathered using interview schedule and analysed using frequency counts, mean, percentages and Pearson Product Moment Correlation at $\alpha 0.05$. Majority (94.9%) listened to COVID-19 jingles while 46.9% listened to the jingles 14-21 times in a week. Overall, a positive behaviour (62.9%), high knowledge (79.7%), favorable attitudes (53.9%) and high practice (54.7%) of COVID-19 preventive measures were recorded among the respondents. One of the constraints limiting the practice of COVID-19 preventive measures was high cost of alcohol-based sanitizer ($x=1.37$). A significant relationship existed between listenership ($r= 0.22$), constraints limiting practice of COVID-19 preventive measures ($r=-0.26$) and behaviour towards COVID-19 preventive measures. Rural dwellers' behaviour was positive towards COVID-19 preventive measures as a result of listening to the COVID-19 jingles. Government and corporate bodies should facilitate the provision of hand sanitizers for rural dwellers to enhance compliance with the messages in the jingles.

Keywords: COVID-19 jingles, Behaviour, COVID-19 preventive measures.

INTRODUCTION

Over the years, behaviour of people changed after information or message is communicated about a particular training on a technology, health, (outbreak of pandemics), social or psychology innovation using a form of mass media, or a combination tagged Behaviour Change Communication (BCC). According to Ngigi and Busolo, (2018) BCC employs a systematic process that combines research with communication planning, implementation, monitoring, and evaluation using both mass media and interpersonal channels to achieve behavioural objectives. That is, it comprises range of processes and methods used to encourage positive health outcomes by making planned and strategic usage of communication to strengthen health seeking behaviours through health literacy of an individual or community on a large scale for community mobilisation, health education, and different public outreach programmes, (Kusum, 2019).

Therefore, immediately a pandemic outbreak occurs, development communicators are ready to provide accurate information to assist people in making best, safe and firm decisions about their health as well as recommendations on preventive guidelines to managing well-being. (Center for Disease Control and Prevention, 2019). Development communicators employ any of the mass media to transfer the information for faster access to such information especially the use of jingles on radio, television, and social media among others. Jingles are pivotal to assist in configuring the mind set of people towards an expected end. Leighton (2018) and Leader, (2020) confirm that jingles are essentially used to appeal or get the attention of potential consumers or listeners or target

audience, arouse their interest and elicit consumption action from them, which are often repeated to make the listener hardly forget the information being passed across. Jingles are so effective that they bring about change of attitude towards unhealthy behaviours, to address any misinformation concerning a particular issue, (Leader, 2020). However, for jingles to be effective they must to be catchy, simple, emotional appealing, create slogan and deliver powerful message to the listeners. They must not more than between 10-30 seconds so as to create impact on listeners' mind, (Rogers, 2020 and Sutherland and Sylvester, 2000).

In 2019, COVID-19 a family of coronavirus was discovered in China while Nigeria recorded its first case on February 20th, 2020 and ever since then, the pandemic has become a major public health challenge globally with countries of the world adopting unprecedented infection prevention and control measures to curtail its rapid spread. The fact that COVID-19 is a viral disease that is caused by severe acute respiratory syndrome which spread speedily called for critical understanding of the epidemiological dynamics of this disease and compliance with preventive measures, (NCDC, 2020). Therefore, health risk communication on accurate knowledge about the health-affecting risk or hazard, the cause of communicable disease and preventive measures must be conveyed to diverse audiences to increase their knowledge improve their attitude and practice. Specifically, among these diverse audiences, the rural populace should be focused because they lack access to accurate and timely information. Rural dwellers can also be easily misguided about COVID-19 and spread wrong rumours that could lead to fear and panic among themselves, all these

among others could worsened the scenario of COVID-19. Hence, NCDC collaborated with media houses to give updated news, to reduce rumours and debunk fake news of COVID-19 on radio, television, mobile phone and social media on a daily basis. The messages were packaged in form of jingles, news, songs and documentaries.

COVID-19 jingles in different forms and ways were broadcasted from different radio and television stations. This was to create awareness on the pandemic disease, to provide key messages about the disease and to build conscious reminder of practicing COVID-19 preventive measures. All aimed to further curb the spread of this deadly disease. According to CLEEN Foundation, (2021) COVID-19 jingles are aired in various languages in Nigeria including Pidgin, English, Yoruba, Igbo and Hausa to give key messages and action for COVID-19 prevention. This is an all-encompassing approach to language barriers. The association of the jingles with the broadcast media especially radio takes the COVID-19 jingle messages very far into rural communities where this communication device is known to be available in large numbers, implying wider reception of the jingle message. Most message on COVID-19 are on how the disease can be transmitted and generally on preventive measures.

Despite, efforts made by NCDC in collaboration with media (radio and television stations) to broadcast COVID-19 jingles in various forms, there are still concerns about rural dwellers' behaviour towards the disease and its preventive guidelines. Because a large proportion of rural dwellers populace are not well educated, lack access to information and amenities like electricity. These, coupled with rural dwellers' misconception that only rich people can contact COVID-19. Although earlier studies on COVID-19 exist (Iorfa, Ottu, Oguntayo, Ayandele, Kolawole, Gandi, Dangiwa & Olapegba, 2020; Ya'aba, Mohammed, Adamu, Yakubu & Adigwe, 2020) none of these researches studied the extent to which COVID-19 jingle broadcasts affects the knowledge, attitude, and practice of listeners. Moreover, it is over a year now that the jingles are aired, it is expected that the jingles must have impacted on rural dwellers' knowledge, attitude and practice of COVID-19 preventive measures. To this end, the study assessed the influence of COVID-19 jingles on rural dwellers behaviour in Oyo State, Nigeria. The specific objectives include to:

1. examine COVID-19 jingles' listenership and listening pattern of the respondents.
2. ascertain rural dwellers' knowledge level of COVID-19 mode of transmission, symptoms and preventive measures heard from the jingles.
3. determine respondents' attitude towards COVID-19 mode of transmission, symptoms and preventive measures.

4. examine the frequency to which rural dwellers practice COVID-19 preventive measures heard from the jingles,
5. identify the constraints to practicing COVID-19 preventive measures heard from the jingles.

The study's hypotheses are as follows:

H₀₁: There is no significant relationship between the rural dwellers' listenership of COVID-19 jingles and their behaviour towards mode of transmission of COVID-19 and its preventive measures.

H₀₂: There is no significant relationship between the rural dwellers' constraints limiting the practice of COVID-19 preventive measures and their behaviour.

METHODOLOGY

The study was carried out in Oyo state, situated on latitude and longitude coordinates of 7°51'9.25"N, 3°55'52.5"E., Nigeria, (Latitude and longitude. Org, (2022). Multistage sampling procedure was used to select respondents for the study. The first stage involved stratification of the local government areas in the Oyo state into rural and urban. There are a total of 33 Local Government Areas (LGAs) in Oyo state out of which 28 are rural local government areas, (Cadmus, Adebusoye and Owoaje, 2022). Therefore, the 28 rural local government areas were purposively selected. At the second sampling stage, simple random sampling was used to select six rural local government areas from the twenty-eight existing in the state. The selected rural local government areas are Ibarapa east, Atiba, Ido, Saki-west, Iwajowa and Surulere. The third stage involved random selection of 30% wards (from Ibarapa east, Saki-west, Surulere, Atiba and Iwajowa rural LGAs) and 50% from Ido rural LGAs of Oyo state. Hence, three wards were randomly selected from Ibarapa east, Atiba, Ido, Saki-west, Iwajowa and Surulere local government areas. The total number of the wards selected was 18 wards.

The last stage involved the random selection of 15 households from each of the selected wards and this gave a total number of 270 respondents for the study. Any available member of the rural household who is 18 years and above was interviewed using questionnaire which was sometimes administered as interview schedule based on literacy level while a return rate of 95% (256) of total sample was used for the analysis.

COVID-19 jingles' listenership and listening pattern were measured by asking respondents to indicate if they had listened to one COVID-19 jingles or the other before, to state the number of times they listen to the COVID-19 jingles in a week and sources of the COVID-19 jingles they listened to among other questions. The response options were dichotomized into '0 = no and 1 = yes'



as well as 1 = radio 2 = television, respectively. Then, using a Z score, respondents' scores were standardised to generate a listenership index which was used to categorise the scores into large and low listenership and mean was the benchmark.

For rural dwellers' knowledge level about COVID-19 mode of transmission, symptoms and preventive measures, a set of 15 knowledge questions were provided for the respondent on mode of transmission of COVID-19, symptoms and preventive guidelines with response options of True = 1 and False = 0. A score of 1 was assigned to 'True' options and zero to 'False' options. Maximum and minimum obtainable score was 15 and 0 respectively. Thereafter, from their responses to the knowledge items, knowledge index (a composite score) was generated and divided into high and low level of knowledge using mean as a benchmark. A score below mean was categorised as low but mean score and above scores were adjudged to be high.

In the same vein, respondents' attitude towards COVID-19 mode of transmission and preventive measures was measured by asking them to respond to a set of positive and negative attitudinal statements about mode of transmission of COVID-19 and its preventive guides. A list of 30 attitudinal items were provided and they were asked to indicate their opinions on a 5 Likert scale. Strongly Agree with assigned score of 5, Agree 4, Undecided 3, Disagree 2, and Strongly Disagree 1 for positively worded statements and Strongly Agree = 1, Agree = 2, Undecided = 3, Disagree = 4, Strongly Disagree = 5 for negatively worded items. However, for easy reportage the scale was merged to 3 of 'Strongly Agree', 'Undecided', and 'Strongly Disagree' after analysis was done. Maximum obtainable point was 150 with a minimum of 30 score. Then, from their responses to the attitudinal questions, attitudinal index (a composite score) was generated and divided into favourable (mean score and above) and unfavourable (below the mean score) attitude using generated mean as benchmark.

Similarly, respondents' practice of COVID-19 preventive guidelines was measured by providing them with a list of 9 major preventive measure items. Three response options of 'Never', 'Seldom' and 'Always' were to choose from, while a score of 0 was assigned 'Never' option, 1 was to 'Seldom' and 2 was assigned to 'Always' option. Minimum and maximum obtainable scores were 0 and 18 respectively. Mean of individual item was calculated and used to rank the preventive measures of the respondent while the measure with the highest mean was ranked first, the one with the least mean was ranked last. Practice index was calculated and used to categorise respondents into high and low

level of practice by employing mean as the yardstick.

Respondents' behaviour towards COVID-19 mode of transmission, symptoms and preventive measures was determined by adding the already generated indices (generated composite scores) of Knowledge, Attitude and Practice (KAP) being the component of behavioural change. It is assumed that since the COVID-19 jingles have been broadcasted for more than a year now, the respondents must have had ample time needed to gather knowledge, form an attitude and improve on the practice of COVID-19 preventive guides, and therefore develop a behaviour towards mode of transmission of COVID-19 and its preventive measures. The new computed behavioural index was then divided into positive and negative behaviour using mean as benchmark. A score below mean was categorised as negative while mean score and above scores were adjudged to be positive behaviour.

Finally, constraints limiting the practice of COVID-19 mode of transmission and preventive guidelines was measured with appropriate response option such as severe constraint, mild constraint and not a constraint. These options were later converted to an individual mean, the hypotheses were analysed using Pearson Product Moment Correlation while other data were analysed using descriptive statistics namely percentages, mean and frequency distribution.

RESULTS AND DISCUSSIONS

COVID-19 jingles' listenership and listening pattern

Table 1 shows that 94.9% of the respondents had listened to one COVID-19 jingles or the other, 82.8% confirmed to have listened to the jingles on radio, 46.9% listened for at least 14 – 21 times in a week and 66.8% opined that the jingles listened to were entertaining and educating. This result is in tandem with the finding of Reuben and Samuel (2020) that radio listeners were exposed to COVID-19 messages on a daily basis. This implies that COVID-19 jingles are being frequently aired on radio and respondents irrespective of their locations heard the jingles multiple times especially in rural areas. Repetition of the broadcast will ensure that either consciously or unconsciously the message is registered in the heart of the listeners. Table 1 also shows that 58.0% of the respondents had a large listenership of COVID-19 jingles. This implies rural dwellers listened widely to the COVID-19 jingles from radio. The fact that they listened via radio is supporting the existing knowledge that radio is still the most used media. The results also implying that entertainment-education is one of the managements of COVID-19 outbreak.

Table 1: COVID-19 jingles’ listenership and listening pattern

Variables	Percentage
Have you listened to one COVID-19 jingles or the other before?	
Yes	94.9
How many times do you listen to COVID-19 jingles in a week?	
<6 times in a week	14.4
6 – 13 times in a week	38.7
14 – 21 times in a week	46.9
From what source did you listen to the COVID-19 jingles?	
Radio	82.8
Television	6.7
Mobile phone	10.5
Reasons for listening to COVID Jingles	
Just for listening sake	0.0
For relaxation	0.8
For entertainment	5.5
For learning	26.9
For entertainment and education	66.8
Variable	%
Large listenership	52.0
Low listenership	48.0

Source: Field Survey (2021)

Respondents’ Level of Knowledge about COVID-19 Mode of Transmission, Symptoms and Preventive Measures

Table 2 shows that the majority (79.7%) of the respondents had high level of knowledge about COVID-19. This implies that listeners are quite knowledgeable about COVID-19 mode of transmission, symptoms and preventive measures and this high knowledge could be attributed to the various regular COVID-19 jingles aired in the study area. This is in tandem with the findings of Christie,

Utibeka, Ekere, Elebe, Imaobong, Dorothy, Wisdom and Victory, (2021); Abdelhafz, Mohammed, Ibrahim, Ziady, Alorab, Ayyad and Sultan (2020); Labban, Thallaj and Labban, (2020) which confirmed that citizens all over the world especially rural dwellers in Nigeria are very knowledgeable about COVID-19 mode of transmission, symptoms and preventive measures. The high level of knowledge would imply that rural dwellers should be able to protect themselves and their loved ones from the deadly disease.

Table 2: Knowledge test on COVID-19 mode of transmission, symptoms and preventive measures

Knowledge tests	Correct (%)
COVID-19 is a respiratory infection	73.1
The signs of COVID-19 infection are dry cough, headache and sore throat	98.4
The symptoms of COVID-19 infection are fatigue, headache and loss of taste and smell	94.9
A person get infected with COVID-19 through close contact with an infected person	97.6
2m distance should be maintained to prevent spread of COVID-19	100.0
Nose mask is use to cover nose and mouth to prevent spread of COVID-19	100.0
Washing of hands with soap and water frequently prevents the spread of COVID-19	100.0
Disinfecting of hands is done with the use of alcohol-based sanitizer	100.0
To prevent the spread of COVID-19 we should avoid birthday parties, Naming ceremonies and social gatherings	82.0
The isolation period for COVID-19 infected person is 2 weeks	79.7
COVID-19 can infect everybody	80.8
The COVID-19 virus spreads via respiratory droplet of an infected person	55.1
COVID-19 is not the same thing as Ebola virus and flu virus	86.7
What do you do if you have an infected person? Go to a health facility	98.4
COVID-19 started from China	94.9
Variable	%
High level of knowledge	79.7
Low level of knowledge	20.3

Source: Field Survey (2021)



Attitude towards COVID-19 Mode of Transmission, Symptoms and Preventive Measures

Table 3 reveals that the majority (94.9%) of the respondents strongly agreed that strictly obeying all COVID-19 preventive measures during the pandemic is key, that COVID-19 vaccine is free and must be taken by all citizens (94.9%). They strongly concurred that wearing of nose masks will reduce the chances of contacting COVID-19 (98.4%), as

well as frequent washing of both hands with soap and running water (100.0%) and 86.7% strongly agreed that everybody can be infected by COVID-19 virus. Meanwhile, 53.9% of the respondents had favourable attitudes towards COVID-19 mode of transmission and preventive measures. This finding is in agreement with that of Christie, Utibeka, Ekere, Elebe, Imaobong, Dorothy Wisdom and Victory, (2021) which found that vast majority of participants had positive attitudes towards COVID-19.

Table 3: Attitude towards COVID-19 mode of transmission, symptoms and preventive measures

Attitudinal statements	SA (%)	UD (%)	SD (%)
Strictly obeying all COVID-19 preventive measures during this pandemic is key	94.9	2.7	2.4
COVID-19 preventive measures are too stressful for to practice	11.7	1.6	86.7
Covering of nose while sneezing and coughing will curb the spread of COVID-19	97.6	1.6	0.8
COVID-19 is not a threat to public health	86.7	1.6	11.7
Regular practice social distancing of 2m will prevent the spread of COVID-19	80.8	5.9	13.3
COVID-19 affects only the rich people	30.5	2.4	67.1
COVID-19 vaccine is free and must be taken by all citizens	94.9	2.7	2.4
COVID-19 vaccine does not prevent infection	86.7	1.6	11.7
During this period, reduction of attendance of social gatherings prevents the spread of COVID-19 virus	26.9	18.0	55.1
COVID-19 is just a rumour	2.3	18.0	79.7
Cleaning of surfaces at home and public places is one of ways to curb the spread of COVID-19	79.7	2.3	18.0
Cleaning of surfaces at home and public places cannot curb the spread of the virus.	26.9	18.0	55.1
It is very difficult to ensure social distancing at a public gathering	67.1	2.4	30.5
Reporting any suspected COVID-19 case to NCDC will prevent its spread	61.7	5.4	32.9
COVID-19 can be prevented by eating spicy food	30.5	2.4	67.1
It is very dangerous when people do not obey social distancing rule	73.1	1.6	25.3
Wearing nose mask to reduce the chances of contacting COVID-19	98.4	1.6	0.0
Wearing of nose mask is dangerous to inhalation/breathing	13.3	4.7	82.0
Sanitizing both hands with alcohol-based sanitizers will reduce the risk of contracting COVID-19	30.5	2.4	67.1
Alcohol-based sanitizer is too expensive for me to buy hence, might not be effective preventive measure	86.7	1.6	11.7
Frequent washing of both hands with soap and running water is a way to avoid getting infected by COVID-19	100.0	0.0	0.0
It is compulsory for government to provide washing facilities for hand washing preventive measure to be effective.	79.7	2.3	18.0
Everybody can be infected by COVID-19 virus	86.7	1.6	11.7
Sharing of nose masks with another will not help to curtail the COVID-19 virus	94.9	2.7	2.4
COVID-19 can be considered as a viral disease that can lead to death	94.9	2.7	2.4
Urban people are more prone to COVID-19 than rural people	26.9	18.0	55.1
Frequent orientation of family and friends about COVID-19 can prevent the virus	97.6	1.6	0.8
COVID-19 is not a curable disease	82.0	4.7	13.3
COVID-19 is a call for concern in my community	11.7	1.6	86.7
COVID-19 vaccine is available to all households	94.9	1.6	3.5
Variable	%		
Favourable	53.9		
Unfavourable	46.1		

Source: Field Survey (2021)

Practice of COVID-19 Preventive Measures

Table 4 reveals that the practice of washing hands with soap and running water was ranked first with mean score of 1.93 among the respondents. This practice was followed by the use nose mask in

public place (\bar{x} =1.82), the practice of sneezing or coughing in between elbow or use of tissue (\bar{x} =1.82), avoidance of handshakes and hugging (\bar{x} =1.48), as well avoidance of close contact with

anyone who has cold or flu-like symptoms ($\bar{x} = 0.97$).

In general, majority (54.7%) of the respondents highly practiced COVID-19 preventive measures compared to 45.3% with low practice index. This implies that respondents do engage in the practice of COVID-19 preventive measures maybe as a results of what they heard from the jingles. This could also be because they are quite knowledgeable about how deadlier the virus is and

wish to protect themselves from the contagious disease.

This finding although is in agreement with the finding of Yen-Chiu, Rei-Lin and Shin-Ru (2020) however, it is in contrast to the discoveries of Ya'aba *et al* (2020) and Ipinnimo, Sanni, Aladesuru, Adebayo, Omowaye, Adeniyi, Ipinnimo, Olasehinde, and Adetunbi (2021) where Nigerians despite their knowledge of the disease, did not comply with the practice of preventive measures of COVID-19.

Table 4: Practice of COVID-19 preventive measures

Preventive measures	Mean	SD
Practice of hand wash with soap and running water regularly	1.93	2.02
The use of my nose with a mask in public places to cover my mouth	1.82	1.99
The practice of sneezing or coughing in between my elbow or the use of tissue	1.82	1.99
Avoidance of hands shaking and hugging others	1.48	1.65
Avoidance of close contact with anyone who has cold or flu-like symptoms	0.97	1.01
Avoidance or reduction of social gatherings attendance because of COVID-19	0.75	0.99
Practice of social distancing of 2m apart at public places	0.56	0.66
Seeking medical care early in case of fever or difficulty breathing	0.44	0.57
The use of alcohol-based sanitizer to disinfect my hands when surfaces are touched	0.43	0.56
Variable	%	
Highly practiced	54.7	
Lowly practiced	45.3	

Source: Field Survey (2021)

Overall Behaviour to COVID-19 Jingles on Mode of Transmission and Preventive Measures of COVID-19

Table 5 reveals that the majority (62.9%) of the respondents had positive behaviour towards COVID-19 mode of transmission and preventive

measures. This implies that rural dwellers after listening to COVID-19 jingles became knowledgeable of COVID mode of transmission and practiced most of the highlighted preventive measures.

Table 5: Overall behaviour to COVID-19 jingles on mode of transmission and preventive measures of COVID-19

Variable	Percentage
Positive	62.9
Negative	37.1

Source: Field Survey (2021)

Constraints to Practicing COVID-19 Preventive Measures

Table 6 shows that on average, high cost of alcohol-based sanitizer ($\bar{x} = 1.37$), difficulty in adapting to the preventive measures ($\bar{x} = 1.25$), and insufficient COVID-19 palliatives ($\bar{x} = 1.18$) were

the major constraints to practicing COVID-19 preventive measures. This could be the majority of them are small income earners and do not have extra money to purchase nose masks and sanitizers to disinfect their hands against the virus infection.

Table 6: Constraints to practicing COVID-19 measures

Constraint items	Mean
High cost of sanitizer	1.37
Difficulty in adaptability	1.25
Insufficient COVID-19 palliatives	1.18
Obligation to go out	0.98
Unbelief about COVID-19	0.52
Uncomfortability with the use of nose mask	0.31



Relationship between listenership of COVID-19 jingles, constraints limiting the practice of COVID-19 preventive measures and behaviour towards mode of transmission of COVID-19 and preventive measures

Table 7 observes that there was significant relationship between rural dwellers' listenership of COVID-19 jingles and their behaviour about COVID-19 mode of transmission and preventive measures ($r=0.22$). The implication is that respondents, by listening to COVID-19 jingles over a year ago changed their behaviour for better towards the mode of transmission and preventive measures of the virus.

Table 7: Correlation between listenership of COVID-19 jingles, constraints limiting the practice of COVID-19 preventive measures and behaviour towards mode of transmission of COVID-19 and preventive measures

Variable	r- value
Listenership index* behaviour index	0.22
Constraint index* behaviour index	-0.26

CONCLUSION AND RECOMMENDATIONS

COVID-19 jingles were widely and sufficiently disseminated on mode of transmission, symptoms and preventive measures among the rural dwellers. They always wash their hands with soap under running water and used nose mask to cover to prevent the spread of the disease which led to them having positive behaviour (Knowledge, attitude and practice) towards COVID-19 mode of transmission, symptoms and preventive measures. However, the cost of buying alcoholic sanitizers was a serious challenge to the practice of COVID-19 preventive measures.

Broadcast of COVID-19 jingles should be continued on all radio stations because it yielded a positive behaviour especially since new cases are reported daily. Also, the concerned development communicators should maximally utilize educational jingles to foster behaviour change communication. This will aid to curbing the challenges experienced to the control the current and any future epidemics.

REFERENCES

- Abdelhafz, A. S., Mohammed, Z., Ibrahim M. E., Ziady, H. H., Alorab M., Ayyad M., Sultan, E. A. (2020). Knowledge, perceptions, and attitude of Egyptians towards the novel coronavirus disease (COVID-19). *Journal of Community Health*, 45(5):881-890. <https://doi.org/10.1007/s10900-020-00827-7>.
- Cadmus, E. O., Adebusoye, L. A. and Owoaje, E. T., (2022). Rural-urban differences in quality of life and associated factors among community-dwelling older persons in Oyo state, South-Western Nigeria. *Qual Quant* 56, 1327-1344. URL <https://doi.org/10.1007/s11135-021-01178-8>
- Center for Disease Control and Prevention, U.S department of Health and Human Services. USA.gov, March 19, 2019
- Christie, D. A., Utibeka, T. N., Ekere, I., Elebe, I., Imaobong, E., Dorothy U., Wisdom, S., Victory, I. E. (2021). Knowledge, Attitude, Perception and Practices towards COVID-19 among rural dwellers in Akwa-Ibom State, Nigeria. *Ibom Medical Journal*, 14(3); 343-360.
- CLEEN Foundation, (2021). Radio Jingle on Covid; Key messages and actions for COVID-19 prevention. <https://cleen.org/jingle-on-covid-19/>
- Iorfa, S. K., Ottu, I. F. A., Oguntayo, R., Ayandele, O., Kolawole, S. O., Gandi, J. C., Dangiwa, A. L. and Olapegba, P. O. (2020). COVID-19 Knowledge, Risk Perception, and Precautionary Behaviour Among Nigerians: A Moderated Mediation Approach. *Frontiers in Psychology*. 11:566773; 1-10. doi: 10.3389/fpsyg.2020.566773
- Ipinnimo, T. M., Sanni, T. A., Aladesuru, T. A., Adebayo, O. A., Omowaye, M. T., Adeniyi, I. O., Ipinnimo, O. M., Olasehinde, O. K. and Adetunbi, A. R. (2021). Knowledge of COVID-19 and practice of preventive measures among adult residents during the ease of lockdown in Nigeria. *Niger Journal of Medicine* 15; 30:464-9. Available from: <http://www.njmonline.org/text.asp?2021/30/4/464/323994>
- Kusum, W. (2019). Behaviour Change Communication (BCC): Importance and

- Strategies. Public Health Note, <https://www.publichealthnotes.com/1142-2/>
- Labban L., Thallaj, N. and Labban, A. (2020). Assessing the level of awareness and knowledge of COVID -19 pandemic among Syrians, *Arch Med*, 12: 2-8.
- Latitude and longitude. Org, (2022). Oyo, Nigeria latitude longitude: Decimal latitude and longitude coordinates for Oyo Nigeria. <https://latitudelongitude.org/ng/oyo/> Date accessed 24-10-2022
- Leader, S. (2020). The impact of jingles in the fight against covid-19 among rural dwellers-a survey of Tai local government area of Rivers state. *American Journal of Communication*, 2, (1); 17- 25.
- Leighton, B. (2018). The Importance of Jingles. Retrieved from Glehtombroadcasting.com
- Ngigi, S. and Busolo, D. N. (2018): Behaviour Change Communication in Health Promotion: Appropriate Practices and Promising Approaches (2018). *International Journal of Innovative Research and Development*, 7(9); 84-93 DOI:10.24940/ijird/2018/v7/i9/SEP18027
- Nigeria Centre for Disease Control (NCDC). (2020). COVID-19 case update (April 9, 2020) Available online at <https://twitter.com/NCDCgov/>
- Reuben, A. A. and Samuel, O. (2020). Exposure to Broadcast Media Messages and Knowledge of Covid -19 Pandemic among Residents of Port Harcourt, Nigeria. *MCC*, 5 (1): 19-37.
- Rogers Karanga, (2020). Radio Jingles: A Simple Yet Catchy Advertising Tool. Bunny Studio, Published on February 28, 2020
- Sutherland, M. and Sylvester, A., (2000). Advertising and the Mind of the Consumer. St Leonards, Allen & Unwin, *Journal of Advertising Research*, 30 (4); 3.
- Ya'aba, Y., Mohammed, S. B., Adamu, A. S., Yakubu, J. G., and Adigwe, O. P. (2020). Assessment of COVID-19 pandemic Knowledge, Attitudes and Practices (KAP) at National Institute for Pharmaceutical Research and Development (NIPRD), Abuja, Nigeria. *Journal of Natural and Applied Sciences*, 8 (2); 21-34.
- Yen-Chiu L., Rei-Lin K., and Shin-Ru S., (2020). Covid-19: The first documented coronavirus pandemic in history. *Biomedical*, 43 (4); 328-333