ARTICLE | OPEN ACCESS

Discovery Agriculture

Nexus of livelihood diversification on food security status among rural households in Agbani agricultural zone of Enugu state, Nigeria

Arigbo Precious Obinna*, **Agbo Chidimma Maryann**

To Cite:
Obinna AP, Maryann AC. Nexus of livelihood diversification on food security status among rural households in Agbani agricultural zone of Enugu state, Nigeria. *Discovery Agriculture* 2024; 10: e4da1547
doi: https://doi.org/10.54905/disssi.v10i21.e4da1547

Author Affiliation:
Department of Agricultural Extension, University of Nigeria, Nsukka, Nigeria

*Corresponding Author
Department of Agricultural Extension, University of Nigeria, Nsukka,
Nigeria
Email: precious.arigbo@unn.edu.ng, arigboprecious@gmail.com
ORCID: 0000-0003-4868-8046

Contact List
Arigbo Precious Obinna precious.arigbo@unn.edu.ng, arigboprecious@gmail.com
Agbo Chidimma Maryann chidimma.agbo.246721@unn.edu.ng

Peer-Review History
Received: 18 November 2023
Reviewed & Revised: 22/November/2023 to 31/January/2024
Accepted: 03 February 2024
Published: 07 February 2024

Peer-Review Model
External peer-review was done through double-blind method.

Discovery Agriculture
pISSN 2347-3819; eISSN 2347-386X

ABSTRACT

The study was conducted to determine the nexus between livelihood diversification and food security among rural households in the Agbani agricultural zone Enugu state. The objectives of study were to: ascertain the livelihood diversification strategies of the respondents; determine the livelihood diversification index; determine the food security status of the rural households; and the relationship between livelihood diversification and food security. A multi-stage sampling procedure was used to select the sample size of 90 respondents. Data was collected using questionnaire and was administered using a Computer Assisted Personal Interview (Kobocollect). The data collected were analyzed using frequencies, percentages and chi-square. The findings revealed that the respondents were involved in on-farm and non-farm livelihood diversification strategies such as animal production, agro-processing/value addition, crop production, farm wage labour, trading, construction/contract work, transport services, tailoring, and hairdressing. The result of the livelihood diversification index showed that the majority (93.3%) of the respondents had a low diversification index. Also, the food security status showed that only 20% of the respondents were food secure, 47.8% were mildly food insecure, 31.1% were moderately food insecure while 1.1% were severely food insecure. The chi-square showed that there was no significant relationship between livelihood diversification and the food security status of the respondents ($X2$ (3, N=90) = 4.25, P =.236). The study recommended that Government should organize programmes and interventions to boost the capabilities of the respondents to diversify since they are lowly diversified.

Keywords: Livelihood Diversification, Food Security

1. INTRODUCTION

Food insecurity has remained a concern for many rural households. About two billion people in the world experience moderate or severe food insecurity. This lack of regular access to nutritious and sufficient food has made many vulnerable to malnutrition and poor health (FAO, 2019). According to the Food Security International Network FSIN, (2018), about 124 million people in 51 countries faced food security crises in the year 2017. Globally, the population has increased over time. Hunger and food security will increase as the global population moves toward 10 billion people living on the earth in 2050. The number of people who are malnourished has increased to about 842 million, approximately 12% of the population of the world (Andualam and Ebrahim, 2021). Specifically, Africa remains the region with the highest prevalence of undernourishment. To promote development in Sub-Saharan Africa, the global difference in malnourishment and food insecurity must be improved.

Therefore, enhancing food security has become a global threat to world leaders and policymakers (Andualam and Ebrahim, 2021). In Nigeria, two-thirds of the population lives in food poverty. Poor access to means of producing food and supporting rural development are among the causative factors (Onuaha et al., 2018; Dooshima et al., 2023; Ahungwa & Sani, 2021). Nigeria, despite being one of the largest economies in Africa has a high level of food insecurity with about 29 million undernourished people (FAO et al., 2021). According to current statistics, in Nigeria alone, about 25.6 million people were undernourished between the years 2016-2018 while 12.1 million people faced severe food insecurity problems between the years 2015 - 2017. In Enugu State, the issue of food security has been a topic of concern.

In research in Enugu State 69.5% of rural households were food insecure during the peak of the COVID-19 pandemic (Egwue et al., 2020). Also, Chiemela et al., (2022) explained that 70% of households in Enugu State do not have food security due to poor access to food, unaffordability of food and poor dietary diversification. Poor performance of the agricultural sector due to outdated agricultural practices has been one of the challenges to achieving food security. Given that most rural Nigeria families depend on Agriculture for their food and livelihood needs, the poor performance of this sector has put households at a high risk of food unavailability and generally food insecurity. This has led the vulnerable rural households to adjust their actions and look for means of improving their income, to meet their livelihood demands (Arowolo et al., 2021).

The adjustment for alternative sources of income to improve livelihood demand is called livelihood diversification. Livelihood diversification is the process by which rural families construct a diverse portfolio of activities, social support to survive and improve their living standards (Ayana et al., 2022). In a world where everyone is struggling to survive, the high rate of food insecurity, poverty and the ever-growing population rate, livelihood diversification has been of the essence. Livelihood diversification for rural households is aims to improve the food security status of rural households. However, the relationship between livelihood diversification and food security status has not been ascertained in the Agbani agricultural zone. Hence, this study was designed to provide empirical evidence on the nexus of livelihood diversification and food security status among the rural households in the Agbani agricultural zone of Enugu State, Nigeria. The specific objectives were to:

1. Ascertain the livelihood diversification strategies,
2. Determine the diversification livelihood index,
3. Determine the food security status, and
4. Determine the relationship between the livelihood diversification index and food security status.

2. METHODOLOGY

The study was conducted in the Agbani Agricultural Zone, Enugu State, Nigeria. The zone is one of the six Agricultural zones in the State. The population consisted of all rural households in the area. A multi-stage sampling procedure was used in selecting the sample size. In the first stage, three agricultural blocks in the area were selected. In the second stage, a proportionate sampling technique was used to select 20% of the circles from each block. This is because there were an unequal number of circles in the blocks. This gave rise to 15 circles from the three (3) agricultural blocks (seven from Nkanu West, six from Nkanu East, and two from Enugu South). In the third stage, six (6) rural households were selected from each selected circle giving rise to 90 respondents used for the study. The data for the study was collected using questionnaire and was administered using Computer Assisted Personal Interview (CAPI).

For this exercise, the Kobo collect application was the source tool used for the CAPI. Specifically, data were collected on different livelihood strategies. The livelihood diversification strategies were categorized into two: On-farm/off-farm and non-farm. Under on-farm/off-farm livelihood diversification, the respondents were asked to choose from any of the options like crop production, animal production, and agro-processing that they have diversity. While under non-farm livelihood diversification, lists of non-farm livelihood diversification strategies were provided and the respondents were asked to choose from the list the areas they have diversified into. The diversification index was calculated for each household. The livelihood diversity index (LDI) is a measure of the diversity of income-generating activities and sources of income within a household. It takes into account the number of different types of livelihood activities.

LDI= n/N

n= Number of livelihood activities engaged in by the respondents

N= Total number of livelihood activities in the study area

The computed Livelihood Diversity Index was categorized into four (4), namely (no diversification, low, medium, and high diversification). Households with an LDI of 0 were categorized as having no diversification, a household with an LDI between 0.01-0.3 was categorized as low diversification, and household with an LDI between 0.4-0.6 was categorized as medium diversification, while households with an LDI ≥ 0.7 were categorized as high diversification. The food security status of the rural households was determined using the Household Food Insecurity Access Scale (HFIAS). The scale comprises nine low food status occurrence questions with responses 'yes' or 'no' and another set of corresponding nine questions on frequency of occurrence during the last 30 days. Based on the responses, the food security status of the rural households was categorized into four food security categories (food secure, mildly food insecure, moderate food insecure and severely food insecure). Data were analyzed and presented using frequencies, percentages and Chi-square.

3. RESULTS AND DISCUSSION

Livelihood diversification strategies

The livelihood diversification strategies were categorized into on-farm/off-farm and non-farm livelihood strategies.

On-farm/off-farm livelihood strategies

The result in Figure 1 shows the livelihood strategies engaged in by the respondents. A greater proportion (40%) of the respondents engaged in animal production. This implied that the respondents in the area were more inclined to rearing animals than any other on-farm/off-farm livelihood strategies. Most of these respondents have small-scale poultry farms kept at either free range or in an enclosure. The free range is easier for the respondents because it requires less capital as intensive feeding, medication, and cleaning of the pens are not necessary. Further, the result shows that 30% engaged in agro-processing/value addition. Value addition in the area was often carried out at off-farm basics. The most common value addition in the area is the processing of cassava tuber into garri, and for few respondents is the processing of cocoyam tuber into cocoyam flour for soup and processing and packing of plantain into plantain chips.

Also, the result shows that 27.78% are engaged in crop production. This is surprising because more respondents were expected to diversify into this area because of the vast arable land in the area. However, the reason for the seemingly low diversification could be due to shortage in the labor force caused by rural-urban migration and the current farmers' herders' crises. Further, the result shows that very few (2.22%) engaged in farm wage labor. Farm wage labor is paid labor for individuals who supply their labor (work for other farms) in exchange for money. This low percentage confirms the assertion that the low diversification into crop production was a result of a low labor force. However, the result conforms Dia et al., (2022), where it was reported that the households engaged in a series of on-farm and off-farm livelihood diversification strategies like arable cropping, livestock, and farm labor.

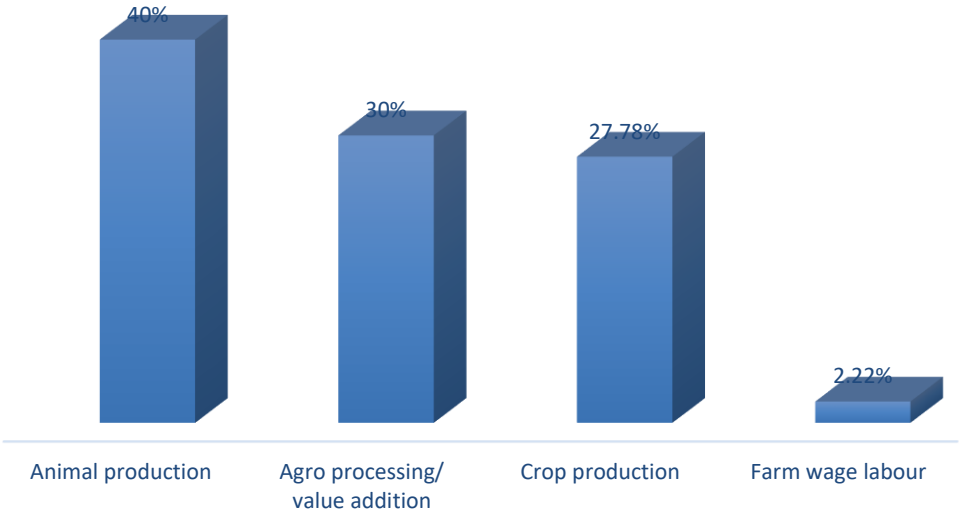

Figure 1 On-farm/off-farm livelihood diversification strategies

Non-farm livelihood diversification

The result in Figure 2 shows the non-farm livelihood diversification strategies of the respondents. The result indicates that greater proportion (36.67%) of the respondents were traders, and 10% were petty traders. This result was expected because many rural households prefer engaging in livelihood strategies that bring daily returns to enable them to meet daily family obligations. Most of the traders depend on daily income for their family's daily meal consumption. Further, the result shows that 7.78% engaged in construction/ contract work, 6.67% involved in transport services, 2.22% engaged in other livelihood strategies and remittances, and 1.11% were wage laborers, tailors, hairdressers, and food vendors the reasons for these low percentages are because these livelihood options do not guarantee daily income. In all, the result shows that rural households engage in several activities to make a living. This also corroborates the findings of Dia et al., (2022), where it was reported that the households engaged in a series of non-farm livelihood diversification strategies such as trading, tailoring, remittances, hairdressing, bricklaying etc.

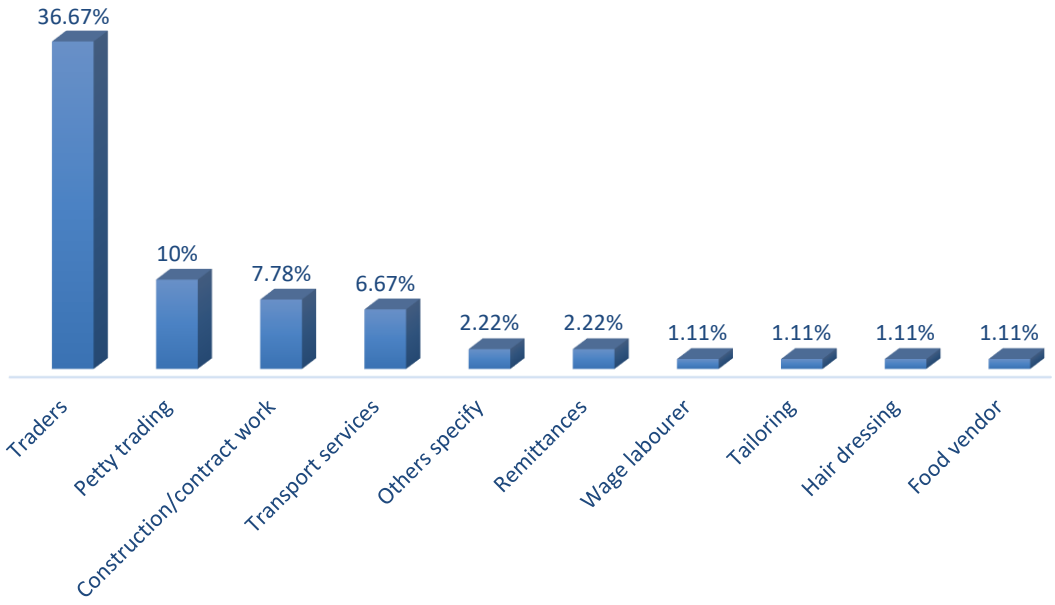

Figure 2 Non-farm livelihood diversification strategies

Livelihood diversification index

The result in Table 1 shows that the majority (55.6%) of the respondents had a low on-farm/off-farm diversification index, and 22.4% had no diversification. The no diversification does not mean no livelihood strategy; it implied that the respondents have a single (mono) source of livelihood for survival. Furthermore, the result shows that 15.6% had medium diversification, while only a few (4.4%) respondents were highly diversified. For non-farm diversification activities, the majority (65.6%) of the respondents had low diversification, while 34.4% had no diversification. The pooled result (on-farm/off-farm + non-farm) diversification index shows that the majority (93.3%) of the respondents had low diversification, while 6.7% had no diversification. This implied that the majority of the respondents were poorly diversified, which limits their sources of income. This could be due to lack of capital needed for livelihood diversification. This is in line with Dia et al., (2022), where the majority of the households had low diversification, and a small percentage being highly diversified.

Table 1 Livelihood diversification index of the respondents

Variable	Diversification index	Frequency	Percentage
On-farm			
No diversification	0	22	22.4
Low diversification	0.01-0.3	50	55.6
Medium diversification	0.4-0.6	14	15.6
High diversification	0.7-1.0	4	4.4
Non-farm			
No diversification	0	31	34.4
Low diversification	0.01-0.3	59	65.6
On-farm + non-farm			
No diversification	0	6	6.7
Low diversification	0.01-0.3	84	93.3

Food Security Status of the rural households

The result in Figure 3 shows that 20% of the households were food secure, while 80% of the respondents were food insecure. This implied that more than two-thirds (80%) of the respondents are food insecure, which may be due lack of resources, and the incidence of farm destruction caused by cattle, rodents, and monkeys as reported by some of the respondents. Some studies corroborate the current findings. For instance, Kassy et al., (2021), reported that 61.1% of households in Enugu State were food insecure. Also, Chiemela et al., (2022), reported that 70% of the households suffered from food insecurity. This suggests that food insecurity in the state has grown over time. The food insecure households were further analysed to ascertain the levels of food insecurity.

Levels of food insecurity

The result in Figure 4 shows that more significant (47.8%) of food ensure households were mildly food insecure. This shows that in addition to having anxiety about not having enough food to eat, they often were not able to eat their preferred meals but rarely eat a limited variety of food or small meals due to lack of resources. Further, 31.1% were moderately food insecure, meaning that they not only worry about not having enough food to eat but have resorted to eating alternative food than what they need more often and sometimes eating smaller amounts of meals than they need and fewer meals in a day. Very few (1.1%) of the food insecure households were severely food insecure, and this means that they often do not have food to eat due to lack of resources and sometimes or often go a whole day and or night without food due to lack of resources. This result implies that high and different levels of food insecurity in the study area, with the majority being mildly food insecure. The high level of food insecurity could be due to poor livelihood support in the rural areas.

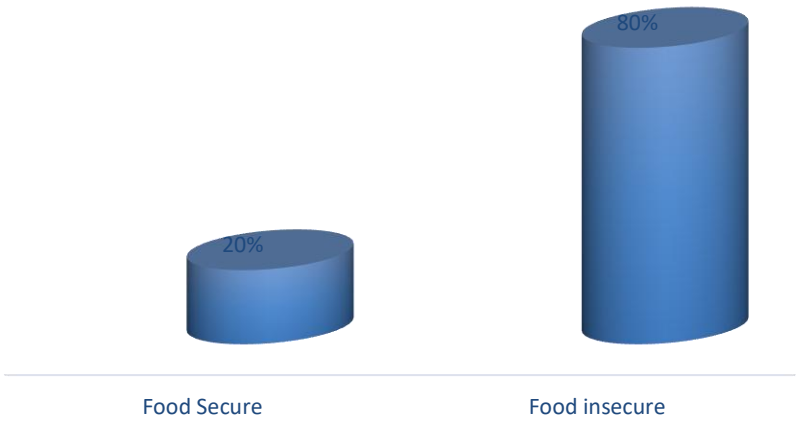

Figure 3 Food security status of the respondents

Most of the respondents were farmers whose seasonal production does not sustain them all year round. Seasonal productions are sold off immediately with little or nothing left during the off-season. Many of them live below the poverty line and with no constant stream of income, and as such are unable to afford the necessary essential nutrition. Hence, constant worry about food and skipping meals. This result is typical, especially in Nigerian rural communities and Africa. Studies on food security status in the area using different approaches have produced similar results. For example, Otekunrin et al., (2021), using Household Food Insecurity Access Scale (HFIAS) categorized the food security level of the households into food secure, mildly food insecure, moderately food insecure, and severely food insecure. Out of 211 cassava farming households, only (27) 12.8% were food secure, while (11) 5.2% were mildly food insecure, (59) 28.0%, were moderately food insecure and (114) 54.0% were severely food insecure. Pooled together the majority (87.2%) of the farming households in the study area were food insecure. Further, Aboaba et al., (2020) in a survey conducted among rural households in southwestern Nigeria categorized the level of food security into very low, low, marginal, and high food security.

The study revealed that most (66.67%) households were at the very low food security level, 1.67% were in the high food security category, 3.89% were in the marginal food security category and 27.78% were in the low food security category. The study concluded that a considerable number of the households were in the very low food security category. Also, Aromolaran et al., (2017), in a survey among rural communities in Nigeria observed that the Majority 86.7% of the farming households in the survey were food insecure, as against few (13.3%) of the respondents that were categorized as a food secured. These studies corroborate the current findings. This high food insecurity among rural households and farming communities is surprising because the bulk of food produced comes from rural areas. Besides, the food insecurity situation brings additional problems. For example, Children from insecure households are more likely to have poor growth attainment, recurrent infections, inadequate energy and nutrient intakes, compromised learning ability, and psychosocial problems.

Relationship between the livelihood diversification index and food security status

The result in Table 2 shows that 73.34% of the food insecure households had a low diversification index. Of these, 45.56% were mildly food insecure, and 26.67% were moderately food insecure. However, only 20% of the respondents with a low diversification index were food-secure, and this represents the total number of food-secure households in the study area. On the other hand, none of the respondents that had no diversification were food secure. Very few (2.22% and 4.44%) were mildly and moderately food insecure, respectively.

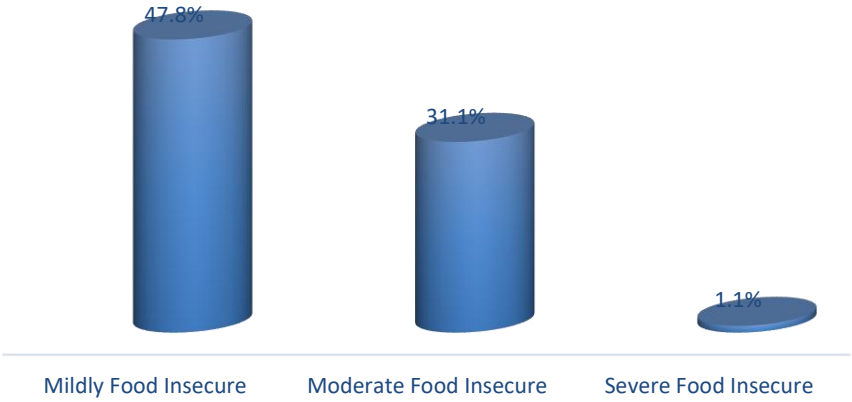

Figure 4 Levels of food insecurity

Furthermore, the chi-square result shows that at P≤0.05, there was no significant relationship between the livelihood diversity index and the food security status of the respondents $X2$ (3, N=90) = 4.25, P =.236. The implication is that the livelihood diversification index does not influence the food security of the respondents. This is in contrast with the findings of Arowolo et al., (2021), where the result of the estimated regression model shows that the likelihood of being food secure among the respondents in the area is significantly higher with a high level of livelihood diversification, implying that livelihood diversification has a significant positive effect on the food security status of the respondents.

Table 2 Relationship between livelihood diversification index and food security

		Food security status				***X2***	**df**	**P.value**
		Food secure	**Mildly food insecure**	**Moderately food inseure**	**Severely food insecure**	**-**	**-**	**-**
Livelihood diversity index	No Diversification	0 (0%)	2 (2.22%)	4 (4.44%)	0(0%)	4.25	3	.236
	Low Diversification	18 (20%)	41 (45.56%)	24 (26.67%)	1(1.11%)	-	-	-

P≤0.05

4. CONCLUSION

The people in the Agbani Agricultural zone of Enugu State, Nigeria were involved in different livelihood strategies ranging from on-farm, off-farm and non-farm. However, there is a general low diversification index. There is also a high level of food insecurity in the area and there is no relationship between the livelihood diversification and food security level

Recommendation

Government and NGOs should organize programs and interventions to boost the capacities of the respondents to diversify since they are lowly diversified.

Government should make policies to mitigate food insecurity and its implementation effected to support and empower the respondents in the study area to be able to come out from their current food insecurity situations.

Acknowledgement
The authors acknowledge the respondents in Agbani Agricultural zone for their willingness to respond to interview guide and also the academic board of the Department of Agricultural Extension, University of Nigeria, Nsukka for organising a seminar that refined the study through their contributions.

Authors' contributions
APO (50%) conceptualized the idea, coordinated the process, reviewed the analysis
ACM (50%) developed the content, collected data and did the analysis

Informed consent
Oral informed consent was obtained from individual participants included in the study.

Conflicts of interests
The authors declare that there are no conflicts of interests.

Ethical approval
Not applicable.

Funding
The study has not received any external funding.

Data and materials availability
All data associated with this study are present in the paper.

REFERENCES

1. Aboaba KO, Fadiji DM, Hussayn JA. Determinants of food security among rural households in southwestern Nigeria: USDA food security questionnaire core module approach. J Agribus Rural Dev 2020; 2(56):113–124. doi: 10.17306/J.JARD.2020.01295
2. Ahungwa GT, Sani RM. Effect of Population Dynamics on Household Sustainable Food Security among the Rural Households of Jigawa State, Nigeria. Discovery Agriculture 2021; 7(17):53-61
3. Andualam K, Ebrahim E. Review of livelihood diversification and food security situations in Ethiopia. Cogent food and agric 2021; 7(1). doi: 10.1080/23322932.2021.1882135
4. Aromolaran AK, Alarima CI, Akerele D, Soetan OJ, Alao AO. Assessment of Food Security among Farming Households in Agarian Communities of Oluyole Area Oyo State, Nigeria. Nigerian Journal of Rural Sociology 2017; 17(2):20-27.
5. Arowolo KO, Adewumi A, Ogunleye AA, Adesina YO. Effects of livelihood diversification on food security among farmers in Tafa Local Government area of Niger State, Nigeria. Nigeria Association of Agricultural Economics, 21st National Conference Lafia 2021 conference book of proceeding 2021.
6. Ayana GF, Megento TL, Kussa FG. The extent of livelihood diversification on the determinants of livelihood diversification I Assosa Wered, Western Ethiopia. GeoJournal 2022; 87:2525-2549. doi: 10.1007/s10708-021-10379-5
7. Chiemela SN, Chiemela CJ, Apeh CC, Ileka CM. Households Food and Nutrition Security in Enugu State, Nigeria. J Agric Ext 2022; 26(2):11-23. doi: 10.4314/jae.v26i2.2
8. Dia YZ, Jongur AAUb, Onu Jib. Livelihood Diversification Strategies as a Means to Poverty Reduction among Rural Farming Households in Adamawa State, Nigeria. Green Rep 2022; 3(7):39-48. doi: 10.36686/Ariviyal.GR.2022.03.07.037
9. Dooshima U, Idyorough AE, Ugbem-Onah C, Nwafor SC. Impact of farmers' internal displacement on household food security in Benue State, Nigeria. Discovery 2023; 59: e101d1276
10. Egwue LO, Agbugba IK, Mukaila R. Assessment of rural household's food insecurity during COVID-19 pandemic in south-east Nigeria. Int J Res Granthaalayah 2020; 8(12):182-194. doi: 10.29121/granthaalayah.v8.i12.2020.2713

11. FAO, IFAD, INICEF, WFP, WHO. The state of food security and nutrition in the world: Transforming food systems for food security, improved nutrition and affordable healthy diets for all. Rome, FAO 2021. doi.: 10.4060/cb4474en
12. FAO. The role of agriculture and rural development in achieving SDG1.1 2019.
13. Food Security Information Network. Global report on food crises 2018.
14. Kassy WC, Ndu AC, Okeke CC, Aniwada EC. Food Security Status and Factors Affecting Household Food Security in Enugu State, Nigeria. J Health Care Poor Underserved 2021; 32(1):565–581. doi: 10.1353/hpu.2021.0041
15. Onuaha OC, Onugu CU, Edoga JC. Contributions of the National Programme on Food Security (NPFS) on households' food security in Enugu State. Int Open Access J 2018; 2(4):512-520.
16. Otekunrin OA, Otekunrin OA, Sawicka B, Pszczółkowski P. Assessing Food Insecurity and Its Drivers among Smallholder Farming Households in Rural Oyo State, Nigeria: The HFIAS Approach. Agriculture 2021; 11:1189. doi: 10.3390/agriculture 11121189