

Coping strategies to mitigate the effects of the COVID-19 pandemic on agricultural household income in Osun state, Nigeria



Kolawole Adelekan Adeloje¹, Dixon Olutade Torimiro¹ and Damilare Samuel Olufemi¹

Abstract - Agricultural households with low socio-economic status in emerging nations face the hardships of generating income, including rural Nigeria. Moreover, the emergence of the COVID-19 pandemic posed a grave risk to these households' finances. Therefore, this study investigates coping strategies to mitigate the effects of the COVID-19 pandemic on agricultural households' income. Data were collected from 150 heads of agricultural households via multistage sampling. Interviews were scheduled and analyzed using the appropriate statistics. Findings showed that 57.3% of respondents were male. The most practiced coping strategies during the pandemic included, in descending order, expenditure rationing ($\bar{x} = 2.63$), job diversification ($\bar{x} = 2.40$), reduced hired labor ($\bar{x} = 2.36$), and household food rationing ($\bar{x} = 2.28$), among others. We found a substantial relation between household size ($r = 0.075$, $p = 0.003$), annual income ($r = 0.033$, $p = 0.004$), and coping strategies ($p \leq 0.005$). We conclude that the pandemic negatively affected the income of agricultural households. The study recommends formulating necessary, effective, and urgent policies such as adequate a social welfare net, provision of relief materials, and improvements in food assistance and revenue-producing prospects for affected households to lessen the negative effect of the pandemic on the income of this population.

Index terms: Family farming; Farming families; Surviving tactics; Revenue; COVID-19

Estratégias de enfrentamento para mitigar o efeito da pandemia de COVID-19 na renda familiar agrícola no estado de Osun, Nigéria

Resumo - A renda de famílias agrícolas com baixo status socioeconômico é uma tarefa em nações emergentes, incluindo as áreas rurais da Nigéria. Além disso, a entrada da pandemia de COVID-19 representou um grave risco para a economia das famílias. Este estudo, portanto, investiga as estratégias de enfrentamento na mitigação do efeito da pandemia de COVID-19 na renda das famílias agricultoras. Os dados para o artigo foram coletados a partir de 150 famílias agricultoras, por meio do método de amostragem multi-estágio, com o uso de entrevista agendada e analisada por meio de estatística. Os resultados mostraram que 57.3 por cento dos entrevistados eram do sexo masculino. As estratégias de enfrentamento amplamente praticadas durante a pandemia foram por ordem decrescente racionamento de gastos ($\bar{x} = 2,63$), diversificação de empregos ($\bar{x} = 2,40$), redução de mão de obra contratada ($\bar{x} = 2,36$), racionamento de alimentação domiciliar ($\bar{x} = 2,28$), entre outras. Há relação substancial entre tamanho do domicílio ($r = 0,075$, $p = 0,003$), renda anual ($r = 0,033$, $p = 0,004$) e estratégias de enfrentamento praticadas em $p \leq 0,005$. Concluiu-se que a pandemia teve grande efeito na renda das famílias de agricultores. O estudo recomenda a formulação de políticas necessárias, eficazes e urgentes, como rede de assistência social adequada, fornecimento de materiais de alívio, juntamente com melhorias na assistência alimentar e perspectivas de geração de receita para as famílias afetadas, a fim de amortecer o efeito negativo da pandemia em sua renda.

Termos para indexação: Agricultura familiar; Famílias agricultoras; Táticas de sobrevivência; Receitas; COVID-19

Introduction

Several pandemics have hit the world: the Great Plague of London, 1665 – the First Cholera Pandemic, 1817 – the Third Plague Pandemic, 1855 – the Fiji Measles Pandemic, 1875 – the Russian Flu, 1889 – the Spanish Flu, 1918 – the Asian flu, 1957 – the HIV/AIDS epidemic, 1981 – the SARS outbreak, 2003 (HISTORY, 2021) – and the Corona virus (COVID-19) pandemic, with its origin in Wuhan, China, in 2019

(JONES et al., 2008; LOVELACE, 2020; JAMISON et al., 2020).

COVID-19 pandemic has impacted everything and everyone around the world, some more than others. Estimates expect Africa to be one of the most harshly infected continents by COVID-19 due to its poverty rate, poor access to excellent health care, inadequate medical staff, and poor technology (WALKER et al., 2020). It has caused many families to make significant changes to their day-to-day

activities due to financial restrictions and other effects stemming from the pandemic. The COVID-19 pandemic and non-pharmaceutical measures to curtail its spread, such as lockdowns, travelling restrictions, social distancing, and face masks, among others, have negatively affected people and families.

Different households greatly affected by the pandemic have, to some extent, adopted different strategies to cope with this crisis (FULLANA et al., 2020, KOOS et al., 2020), its associate

lockdown, and how life has changed since then. However, some coping strategies, such as selling agricultural/non-agricultural assets and reducing food consumption (KOOS et al., 2020) seem insufficient to meet households' food and other needs. Generalizing coping strategies in such an emergency is hard since effective strategies for one part of the country might not be effective in another. This study specifically defines the agricultural household heads' characteristics, identifies their economic activities, examines how COVID-19 pandemic has affected agricultural households' income, and investigates the coping strategies they employed to mitigate the effects of the pandemic on household income in the assessed area. We postulated the absence of any substantial relation between household heads' characteristics and their coping strategies. This study can provide an enhanced overview of the increase in agricultural household size and the apt reactions to mitigate the effects of the COVID-19 pandemic. The outcomes might contribute to formulating definite policies for poor agricultural households.

Materials and methods

This study was conducted in Osun state, in Southwestern Nigeria. The state is located within the forest region in Southwestern Nigeria and its capital, in Osogbo. It covers an area of about 14,875km² and had an estimated population of 3,705,589 in 2016 (NIGERIA, 2018). The state has 30 Local Government Areas (LGAs).

The studied area is divided into six administrative zones: Ede, Osogbo, Iwo, Ikirun, Ife, and Ilesha. A Multi-stage sampling was adopted. This purposive sampling technique was used first to select the most rural/agricultural LGAs among the six administrative zones; totaling 6 LGAs. During the second stage, a proportionate sampling was employed to select 10% of all communities in each selected LGAs; i.e., two southern LGA communities in Ede; three, from the Olorunda LGA in Osogbo; four, from the Iwo LGA in Iwo; five, from the Oriade LGA, in Ilesha;

one, from the Ifedayo LGA, in Ikirun; and three, from the north-Ife LGA in Ife, totaling 18 communities. During the third stage, proportionate sampling was used to select respondents from each community, totaling 150 individuals. Before surveying them, informed consent was obtained from all participants. We introduced prospective participants to our goals before including them in the study. Those who agreed with our aims participated voluntarily. A pre-tested interview schedule was used to elicit data between July 8 and 25 2022, analyzed via SPSS - 2020 Edition.

Coping strategies to mitigate the effects of the COVID-19 pandemic on agricultural households' income was measured by asking respondents to rate the strategies they had been using into very often (3), often (2), rarely (1), and never (0). The lowest possible score was 0, whereas the highest, 36. The effect of the pandemic on household income was measured by asking respondents to rate a list of possible effects on household income (derived from the literature) into no effect (0), little effect (1), moderate effect (2), and serious effect (3), as per Adeloye et al. (2020). The lowest achievable score was 0, whereas the highest, 48.

Results and discussion

Characteristics of household heads

Table 1 shows that respondents' average age was 49.09±10.95 years, implying that they were middle aged but economically active and productive. Table 1 also shows that most of heads of households were male (57.3%), suggesting that agricultural family heads in farming areas are mostly men. This corroborates the findings in Omotoso et al. (2018), which found that males constitute most agricultural heads of households in Ogun state, Nigeria. Moreover, the Table shows that most of respondents (72.0%) had at least primary school education. This agrees with Obaniyi (2020) and Ayinde et al. (2016), who asserted that most respondents were literate due to a considerable attainment rate of either primary or secondary school

education. Household size averaged 5±1.83 persons. This finding mirrored that in Omotoso et al. (2018), who reported that household size in rural Nigerian communities averaged seven persons in 2017. This finding shows that rural households were no longer as large as they used to be in the 1960s and 1970s, when this population needed large household sizes for farm labor. Table 1 also shows that many (58.0%) individuals are involved in farming as their primary occupation and earned a mean annual income of ₦80,126±80,041.50 (conversion rate: US\$1=₦410). This corroborated the findings in Nwaobiala & Ogbonna (2014), who reported that most land workers are low-income earners.

The Economic Activities of Heads of Agricultural Households

On-farm activities

Table 2 shows that most (74%) heads of households worked as arable crop farmers, 58% of respondents produced tree crops; 57.3%, livestock; and 17.3%, fishery. This result implies that some respondents engaged in more than one on-farm activity and that arable crop production predominated. This suggests that respondents will likely engage in more on-farm activities during the pandemic since most may be unable to engage in other type of activities due to restrictions and lockdowns. Results also support the finding in OECD (2009) and Omonona et al. (2015), who reported that farming is the main occupation in rural Nigerian communities.

Off-farm activities

Table 2 show that 27.3% heads of households were wage laborers, 62% worked in agro-processing; 88.7%, in agro-marketing; and 32.7%, in input supply. This suggests that most respondents engaged in agro-marketing, meaning they mainly sell their crops and animal products on the market. At the same time, a considerable number worked in agro-processing. Therefore, this finding shows that marketing agricultural products constitutes respondents' main off-farm activities.

Table 1. Characteristics of the heads of agricultural households in 2 Osun State, Nigeria, 2021
Tabela 1. Características dos chefes de famílias agricultoras no estado de Osun, Nigeria, 2021

Variables	Frequency	%	Mean	Std.
Age (year)			49.09	10.95
≤40	42	28.0		
>40	108	72.0		
Sex				
Male	86	57.3		
Female	64	42.7		
Educational attainment				
No formal education	27	18.0		
Primary	19	12.7		
Secondary	68	45.3		
Tertiary	36	24.0		
*Primary occupation				
Farming	87	58.0		
Petty trading	27	18.0		
Craftsmanship	19	12.7		
Civil service	13	8.7		
Household size			5.0	1.83
<3	16	10.7		
4-6	125	83.3		
>6	9	6.0		
Monthly income (₦)			80,126.67	80,041.50
≤50,000	89	59.3		
50,001-150,000	42	28.0		
>150,000	12	12.7		

Source: Field survey, 2021

Table 2. Economic activities of heads of agricultural households in Osun State, Nigeria, 2021
Tabela 2. Atividades econômicas dos chefes de família agricultora no estado de Osun, Nigeria, 2021

*Economic activities	Frequency	%
On-farm activities		
Arable crop	111	74.0
Tree crop	87	58.0
Livestock	86	57.3
Fishery	26	17.3
Off-farm activities		
Wage labour	41	27.3
Agro-processing	93	62.0
Agro-marketing	133	88.7
Input supply	49	32.7
Non-farm activities		
Trade	77	51.3
Tailoring	13	8.7
Carpentry	9	6.0
Com. Motorcycle Operation	22	14.7
Vulcanization	9	6.0
Hairdressing	8	5.3
Craftsmanship	22	14.7
Civil service	13	8.7

*Multiple responses

Source: Field Survey, 2021

Furthermore, since agro-marketing and agro-processing are the household's heads' main off-farm activities, these activities would most likely to suffer from the COVID-19 pandemic, forcing the heads of households to adopt coping strategies, such as taking government input subsidies, to mitigate the effects of the COVID-19 pandemic on their households. Results also support the findings in Balde et al. (2020), who showed that marketing agricultural products is the second largest economic activity in rural areas and that it had been dramatically affected by the pandemic.

Non-farm activities

Table 2 shows that 51.3% of heads of households worked in trading; 8.7%, in tailoring; 6%, in carpentry; 14.7%, in commercial motorcycle usage; 6%, in vulcanization; 5.3%, in hairdressing; 14.7%, in craftsmanship; and 8.7%, in civil services. This implies that the heads of households engage in at least one or more non-farm activities and that trading is the main non-farm activity. Respondents' non-farm activities would most likely suffer from government lockdowns and restrictions, which would lead them to adopt coping strategies, such as taking new job opportunities, to mitigate the effects of the COVID-19 pandemic on their households. These results support the findings in Ovwigho (2014), who found that agricultural households usually participate in various non-farm income-generating activities, apparently to balance the shortage of income due to the seasonality of agricultural production and develop unceasing sources of income to satisfy the different household needs.

The effects of the COVID-19 pandemic on agricultural household's income

Table 3 shows the mean rank of effects of the COVID-19 pandemic on agricultural households' income. Results show that the effect on household expenditure ranked highest among all effects (mean = 2.52), followed by reduced ability to save money (mean =

2.47), increased production costs (mean = 2.44), decreased access to financial institutions (mean = 2.37), affected work supply (mean = 2.21), decreased spending power (mean = 1.91), reduced cooperation with other people (mean = 1.87), and affected credit ratings (mean = 1.71).

Table 3 also shows that the pandemic helped respondents discover new ways of doing business (mean = 1.35) and marketing (mean = 1.33), increased household size (mean = 1.05), affected owned properties and the acquisition of new properties (mean = 1.04), and affected employment opportunities (mean = 0.85). Based on these results, increased household expenditures, reduced ability to save money, decreased spending power, and increased production costs, which are associated with household income, constitute the major effects of the COVID-19 pandemic on rural households. Moreover, reduced access to financial institutions and affected work supply — a major COVID-19 pandemic effect on agricultural households — may be due to lockdown and restrictions imposed by the government. This result implies that most respondents agreed that the pandemic had a moderate effect on their income. This might be associated with the fact that many heads of households work on daily wages, might suffer from unemployment, and have no alternative source of revenue. This result mirrors the findings in Ayewumi & Okeke (2020), Celik et al. (2020), and Sumner et al. (2020), who stated that the pandemic would inversely influence poor people's finance, especially in Sub-Saharan Africa. Thus, family incomes would significantly decrease and family expenditures, increase.

Coping Strategies to Mitigate the Effects of the COVID-19 Pandemic on Agricultural Households' Income

Table 4 shows the mean rank order of the coping strategies used to mitigate the effects of the pandemic on agricultural households' income. Results

Table 3. Distribution of respondents by the effect of COVID-19 on agricultural household income in Osun State, Nigeria, 2021

Tabela 3. Distribuição dos entrevistados por efeito do COVID-19 na renda familiar agrícola no estado de Osun, Nigéria, 2021

Respondents' statements	NE	LE	ME	SE	M
	Freq.(%)	Freq.(%)	Freq.(%)	Freq.(%)	
Effect on household purchasing capacity	61(40.7)	41(27.3)	27(18.0)	21(14.0)	1.05
Effect on work experience	32(21.3)	58(38.7)	45(30.0)	15(10.0)	1.29
Effect on household social networks	52(34.7)	30(20.0)	49(32.7)	19(12.7)	1.23
Effect on employment	71(47.3)	39(26.0)	32(21.3)	8(5.3)	0.85
Effect on credit rating	19(12.7)	30(20.0)	77(51.3)	24(16.0)	1.71
Effect on marketing methods	35(23.3)	55(36.7)	36(24.0)	24(16.0)	1.33
Effect on ways of doing business	47(31.3)	36(24.0)	34(22.7)	33(22.0)	1.35
Effect on work supply	11(7.3)	21(14.0)	44(29.3)	74(49.3)	2.21
Effect on owned properties and the acquisition of new ones	66(44.0)	29(19.3)	38(25.3)	17(11.3)	1.04
Effect on purchasing power	27(18.0)	28(18.7)	26(17.3)	69(46.0)	1.91
Effect on household expenditure	7(4.7)	13(8.7)	25(16.7)	105(70.0)	2.52
Effect on access to a financial institution	11(7.3)	13(8.7)	35(23.3)	91(60.7)	2.37
Effect on saving ability	4(2.7)	20(13.5)	27(18.0)	99(66.0)	2.47
Effect on work cooperation with other members of the community	22(14.7)	22(14.7)	60(40.0)	46(30.7)	1.37
Effect on the cost of production	2(1.3)	14(9.3)	50(33.3)	84(56.0)	2.44

NE = "no effect," LE = "little effect," ME = "moderate effect," SE = "serious effect,"

M = "mean"

Source: Field Survey, 2021

showed that "Rationed spending (mean = 2.63) ranked the highest, followed by "Diversification into a new job (mean = 2.40)," "Labor usage reduction (mean = 2.36)," "Food rationing (mean = 2.28)," "Capital inflows from family and friends (mean = 2.15)," "Financial institution loans (mean = 2.09)," "Free health care provision (mean = 2.09)," "Input subsidy provision (mean = 1.87)," "Government palliatives (mean = 1.79)," "Government tax breaks (mean = 1.75)," "Loan interest reduction (mean = 1.71)," and "Skill acquisition center (mean = 1.71)." From this result, we can infer that respondents rationed spending (which has the highest mean)

the most to mitigate the effect of the pandemic on agricultural households. Also, they used diversification into new jobs and reduction in labor usage to create new income streams and reduce production costs during the pandemic. While government palliatives and tax breaks and skill acquisition centers ranked lowest, this may stem from the government failing to effectively and efficiently play its role to care for people's needs during this period. The effect of the pandemic on households is exceptional and we observe different responses among families due to their different socio-economic status (SES). Previous studies have reported a similar

Table 4. Respondents' coping strategies to mitigate the effects of the COVID-19 pandemic in Osun State, Nigeria, 2021

Tabela 4. Entrevistados sobre estratégias de enfrentamento usadas para mitigar o efeito da pandemia de COVID-19 no estado de Osun, Nigeria, 2021

Coping strategies	Very often Freq. (%)	Often Freq. (%)	Rarely Freq. (%)	Never Freq. (%)	Mean	Rank
Input subsidies from the government	40(26.7)	61(40.7)	39(26.0)	10(6.7)	1.87	8 th
Government palliatives	43(28.7)	49(32.7)	41(27.3)	17(11.3)	1.79	9 th
Household food rationing	76(50.7)	44(29.3)	26(17.3)	4(2.7)	2.28	4 th
Rationed spending	108(72.0)	33(22.0)	5(3.3)	4(2.7)	2.63	1 st
Financial institution loans	68(45.3)	44(29.3)	21(14.0)	17(11.3)	2.09	6 th
Free health care provision	65(43.3)	41(27.3)	37(24.7)	7(4.7)	2.09	6 th
Loan interest reduction	30(20.0)	59(39.3)	48(32.0)	13(8.7)	1.71	11 th
Skill acquisition centre	16(10.7)	38(25.3)	82(54.7)	14(9.3)	1.37	12 th
Government tax breaks	49(32.7)	37(24.7)	41(27.3)	23(15.3)	1.75	10 th
Capital inflows from family	69(46.0)	40(26.7)	36(24.0)	5(3.3)	2.15	5 th
Reduction in hired labour	62(41.3)	81(54.0)	6(4.0)	1(0.7)	2.36	3 rd
Diversification into new jobs	96(64.0)	21(14.0)	30(20.0)	3(2.0)	2.40	2 nd

Source: Field Survey, 2021

situation in the state of Osun state, Nigeria, postulating that rural families with high SES might have better coping strategies and greater resilience than those with low SES; findings which agree with Gideon et al. (2020); Mukaila et al. (2020), and Okidim et al. (2021); agricultural households adopted skipping meals, engaging in additional small-scale productivity activities, borrowing money to buy food, among others to cope during the COVID-19 pandemic.

Relation between Selected Characteristics and Coping Strategies

We found no substantial relation between coping strategies to mitigate the effects of the COVID-19 pandemic and respondents' characteristics.

Table 5 shows that occupation has a significant association ($p \leq 0.05$) with coping strategies to mitigate the effects of the COVID-19 pandemic on agricultural households. It also shows that gender, religion, marital status, educational attainment, and travel frequency have no significant association ($p < 0.05$) with such coping strategies.

Furthermore, Table 6 shows the relation between selected characteristics and coping strategies. Results show that household size ($r = 0.075$, $p = 0.003$) and annual income ($r = 0.033$, $p = 0.004$) have a positive relationship ($p \leq 0.05$) with coping strategies to mitigate the effects of the COVID-19 pandemic on rural households' income as do age ($r = 0.029$, $p = 0.722$) and work experience ($r = -0.001$, $p = 0.991$) ($p \leq 0.05$).

Conclusions

- Based on the study outcomes, many heads of households were male and involved in on-farm, off-farm, and non-farm activities to make ends meet. Many claimed that the pandemic negatively impacted their households' income.

- The most common coping strategies during the pandemic were rationed spending, job diversification, reduction in hired labor, and household food rationing, among others.

- We conclude that the pandemic adversely affected agricultural households' income.

- We recommend the formulation of necessary and effective policies, such as an adequate social welfare net, provision of relief materials, improved food assistance, and revenue-producing prospects for affected households, to help lessen the negative effect of the pandemic on these households' income.

References

- ADELOYE, K.A.; AJAYI, A.O.; SOTOMI, A.O. Effect of Leventis Foundation Youth Agricultural Empowerment Programme on Trainees' Food Output In Osun State, Nigeria. *Cercetări Agronomice în Moldova*, Iași, v.53, n.2, p.207-216, 2020. DOI: 10.46909/cerce-2020-018.
- AYINDE, J.O.; TORIMIRO, D.O.; OYEDELE, D.J.; ADEBOOYE, C.O.; DEJI, O.F.; ALAO, O.T.; KOLEDYOYE, G.F. Production and Consumption of UIVs among men and women: Evidence from Southwest Nigeria. *Ife journal of Agriculture*, Ile-Ife, n.26, p.101-110, 2016.
- BALDE, R.; BOLY, M.; AVANYO, E. *Labour Market Effects of COVID-19 in Sub-Saharan Africa: An Informality Lens From Burkina Faso, Mali and Senegal*. Maastricht: United Nations University - Maastricht Economic and Social Research Institute on Innovation and Technology (MERIT), 2020. Available on: <https://ideas.repec.org/p/unm/unumer/2020022.html> Accessed on: 24 jul. 2021.
- CELIK, B.; OZDEN, K.; DANE, S. The Effects of COVID-19 Pandemic Outbreak on the Household Economy, *Journal of Research in Medical and Dental Science*, Jamnagar, v.8, n.4, p.51-56, 2020.

Table 5. Chi-square analysis showing the association between selected characteristics and coping strategies against the effects of the COVID-19 pandemic on households' income in Osun State, Nigeria, 2021

Tabela 5. Análise qui-quadrado mostrando associação entre características selecionadas e estratégias de enfrentamento contra o efeito da pandemia de COVID-19 na renda familiar no estado de Osun, Nigeria, 2021

Variables	χ^2	DF	P-value	Decision
Sex	1.175	1	0.278	Not significant
Religion	0.131	2	0.937	Not significant
Marital status	3.826	3	0.281	Not significant
Level of education	4.534	3	0.209	Not significant
Occupation	0.987	2	0.003	Significant
Travel frequency	3.323	3	0.344	Not significant

χ^2 = chi-square, DF = Degree of freedom

Significant at $p \leq 0.05$

Source: Field Survey, 2021

Table 6. Correlation analysis showing the relation between selected characteristics and coping strategies to mitigate the effects of the COVID-19 pandemic on households' income in Osun State, Nigeria, 2021

Tabela 6. Análise de correlação mostrando a relação entre características selecionadas e estratégias de enfrentamento para mitigar o efeito da pandemia de COVID-19 na renda das famílias no estado de Osun, Nigeria, 2021

Variables	R	P-value	Decision
Age	0.029	0.722	Not significant
Household size	0.075	0.003	Significant
Years of work experience	-0.001	0.991	Not significant
Annual income	0.033	0.004	Significant

r = correlation coefficient

Significant at $p \leq 0.05$

Source: Field Survey, 2021

FULLANA, M.A.; HIDALGO-MAZZEI, D.; VIETA, E.; RADUA, J. Coping Behaviors Associated with Decreased Anxiety and Depressive Symptoms During the COVID-19 Pandemic and Lockdown. *Journal of Affective Disorders*, Amsterdam, v.275, p.80-81, 2020. DOI: <https://doi.org/10.1016/j.jad.2020.06.027>.

GIDEON, O.I.; ALLI, O.J.; IFEOMA, M.E.; OBINNA, C.O.; LINDA, O.E.; FOLASADE, A.A.; NWABUMMA, C.A.; ABDULAFEEZ, S.M.; HANNAH, C.E.; OLUWADAMILARE, E.K.; CYNTHIA, C.O.; UCHECHI, P.O.; LINDA, E.O. Food Consumption and Coping Strategies of Urban-Households in Nigeria During the COVID-19 Pandemic Lockdown. *World Nutrition*, London, v.11, n.3, p.35-50, 2020.

HISTORY. **Pandemics That Changed History:** As human civilizations rose, these diseases struck them down. History. New York, 2021. Disponível em: <https://www.history.com/topics/middle-ages/pandemics-timeline>. Acesso em: 10 dez. 2021.

JAMISON, D.T.; GELBAND, H; HORTON, S; JHA, P; LAXMINARAYAN, R; MOCK, C. N.;

NUGENT, R. Disease Control Priorities: Improving Health and Reducing Poverty. 3. ed. In: SUN, J.; HE, W.; WANG, L.; LAI, A.; JI, X.; ZHAI, X.; MADHAV; OPPENHEIM, B.; GALLIVAN, M.; MULEMBAKANI, P.; RUBIN, E.; WOLFE, N. **Pandemics: Risks, Impacts, and Mitigation**. Washington, DC: World Bank, 2020.

JONES, K.E.; PATEL, N.G.; LEVY, M.A.; STOREYGARD, A.; BALK, D. Global Trends In Emerging Infectious Diseases. *Nature*, London, v.451, n.7181, p.990-93, 2008.

KOOS, C.; HANGOMA, P.; MÆSTAD, O. **Household Wellbeing and Coping Strategies in Africa During COVID-19:** Findings From High Frequency Phone Surveys. Bergen: CMI Report, 2020.

LOVELACE, B. World Health Organization Names the New Coronavirus: *COVID-19* 2020. **CNBC**, New Jersey. 11 fev. 2020. Disponível em: <https://www.cnb.com/2020/02/11/world-health-organization-names-the-new-coronavirus-covid-19.html>. Acesso em: 12 jun. 2021.

MUKAILA, R.; FALOLA, A.; OMOTESHO, O.A. Food security status: its drivers and coping strategies among vegetable farming households. *Cercetări Agronomice În Moldova*, Iași, v.53, n.4, p.414-425, 2020. DOI: <https://doi.org/10.46909/cerce-2020-035>.

NIGERIA. NATIONAL BUREAU OF STATISTICS. **NBS Demographic Statistics Bulletin**. Abuja: National Bureau of Statistics, 2018.

OECD – ORGANISATION FOR ECONOMIC COOPERATION AND DEVELOPMENT. **The Role of Agriculture and Farm Household Diversification in the Rural Economy:** Evidence and Initial Policy Implications. Paris: OECD, 2009.

OKIDIM, I.A.; EGWUE, L.O.; EKINE, D.I.; CHUKUIGWE, E.C. Rural Households' Food Insecurity and Coping Strategies During COVID-19 Pandemic in Enugu State, Nigeria. *Journal of Asian Rural Studies*, Makassar, v.5, n.2, p.126-13, 2021.

OMONONA, B.T.; OBISESAN, A.A.; AROMOLARAN, O.A. Health-Care Access and Utilization Among Rural Households in Nigeria. *Journal of Development and Agricultural Economics*, Mashhad, v.7, n.5, p.195-203, 2015.

OMOTOSO, A.B.; DAUDA, A.S.; ADEBAYO, R.A.; OMOTAYO, A.O. Socioeconomic Determinants of Rural Households' Food Crop Production in Ogun State, Nigeria. *Applied Ecology and Environmental Research*, Budapest, v.16, n.3, p.3627-3635, 2018.

OVWIGHO, B.O. Factors influencing involvement in non-farm income generating activities among local farmers: The Case of Ughelli South Local Government Area of Delta State, Nigeria. *Sustainable Agriculture Research*, Ontario, v.3, n.1, p.76-84, 2014.

SUMNER, A.; HOY, C.; ORTIZ-JUAREZ, E. **Estimates of the Impact of COVID-19 on Global Poverty**. Helsinki: United Nations University World Institute for Development Economics Research, 2020. DOI: <https://doi.org/10.35188/UNU-WIDER/2020/800-9>.

WALKER, P.G.T.; WHITTAKER, C.; WATSON, O.J.; BAGUELIN, M.; WINSKILL, P.; HAMLET, A; et al. The Impact of COVID-19 and Strategies for Mitigation and Suppression in Low- and Middle-Income Countries. *Science*, New York, v.369, p.413-422, 2020.