



## PRICE AND OUTPUT TREND OF GINGER IN NIGERIA FOR THE PERIOD 1990 – 2020

**\*Tanko, F., Ibrahim, F. D., Yisa, E. S. and Ojo, O. A.**

Department of Agricultural Economics and Farm Management,  
Federal University of Technology, Minna, Nigeria

**\*Corresponding Author's Email:** tankofidelis2015@gmail.com **GSM:** 08038351128

### ABSTRACT

The study analyzed the price and output trend of ginger in Nigeria for the period 1990 – 2020. The study utilized secondary data and were analyzed using descriptive statistics such as means frequency distribution, percentages, standard deviation and graph. The result shows that ginger has an all-time maximum output of 927,041 Metric tonne (MT) and an all-time minimum output of 420,000 MT over the considered time period. The all-time minimum price was ₦145/kg while the maximum price was ₦690.50/kg. The results indicate high variability in ginger output and price with standard deviation of 263,319 MT and ₦183.2479/kg, respectively. The result further revealed three major periods for Nigerian ginger production over the past 20 years. The first was from 2000-2006, characterized with a high area of ginger cultivation, averaging 169,857 (ha) or 51.3% of the global total, but a low yield, at 6,186 MT/ha. The second period ran from 2007-2014, first with a jump in yields to an average of 21,017 MT/ha from 2007-2010 and a decline in area harvested, to just 52,256 hectares, or 20.5% of the world total. This was followed by a brief spike in yields to 54,085 MT/ha in 2011 and rise in area harvested to 2013, before a reversion for both closer to 2007-2010 levels. The third period from 2015 saw yields catching up more sustainably to Asian levels, reaching 82,138 MT/ha as of 2019, while area harvested stabilized, and stood at 80,104 ha in 2019 or 21.8 of the global total. From this study, it can be concluded that Nigeria has comparative advantages in growing ginger, which is noticeable with the geographical features and well-adapted local varieties. The trend of enormous growth in ginger production and its export indicates that ginger production and trade could be a potential enterprise contributing to the national economy. It is recommended to focus on enhancing ginger productivity by providing training and extension services to farmers, efficient pricing system, establishing ginger processing units, easy and reliable certification within the country, and enhancing diplomatic relations for easy market accessibility for strengthening the ginger sub-sector.

**Keywords:** Ginger, Output, Period, Price and Trend

### INTRODUCTION

Nigeria is the third-largest producer of ginger in the world (after India and China). Nigerian ginger is among the best in the world, with its aroma, pungency and high oil and oleoresin content as distinct features. Kaduna stands as the highest producer of the crop while Nasarawa, Gombe, Bauchi, Benue among other States are the major producers (National Agricultural Extension and Research Liaison Services [NAERLS] 2020; Sodangi, 2020; Ayodele and Sambo, 2014). Nigeria could use ginger to position itself in different ways on the domestic, regional and European markets (EU market) (Obinatu, 2016). On the EU market, there is scope to expand Nigeria's current fresh and dried ginger exports, by focusing among others on quality improvements and meeting the mandatory EU market requirements, as well as exploring opportunities for certification and gaining access to niche market segments.

In the EU, healthy and cosmopolitan lifestyle dishes, drinks, snacks and food supplements in which ginger is a key ingredient are experiencing increasing popularity.



Another specific trend from which Nigeria can benefit especially is the fact that European demand peaks in winter time, when supply is low and prices are high. Nigeria, being a country with year-round ginger supply, can offer a constant supply to meet such demand (Food and Agriculture Organization Statistical Corporate Database (FAOSTAT), 2018; Ezra *et al.*, 2017; Sunday *et al.*, 2014). Ginger (*Zingiber officinale*) is a perennial herb revered as one of the most popular and valued spices of the world. The most useful part of this plant is the underground rhizome. Besides being used as a spice, the dry ginger is also used to produce oil, oleoresin, essences, soft drinks, and nonalcoholic beverages. Ginger also has manifold medicinal properties as a carminative and stimulation of gastro-intestinal tracts (Pakhuan and Sukanlaya, 2021).

Despite all the potentials and opportunities of having such a long history with a diversified conducive agro-ecology base, this spice sub-sector potential remains unexploited in Nigeria. The sub-sector is still not organized or packaged, low in productivity and inefficient (Sodangi, 2020). The challenge of the low price of the ginger products also tends to repel most of the Nigeria farmers from continuing the farming of ginger (Nmadu and Marcus, 2011). The Nigerian ginger market is highly volatile, with daily price fluctuations due to inadequate government intervention in creating a fixed price model. Even with its large production, Nigeria is only a small contributor to global ginger exports, at just 3.5% of the total volume in 2019. Though studies have been conducted on ginger value chain, production efficiency and factors influencing the choice of marketing outlets by ginger farmers by Nmadu and Marcus (2012); Ayodele and Sambo (2014); Abah *et al.* (2015).

However, there is scanty study on the price and output trend of ginger in Nigeria. This study therefore helps us to assess the progress of ginger as a spice crops in a given period and also locate the weakness in planning programmes with a view to drawing valid conclusions and appraising the behaviour its supply in the context of raising demand. This study was undertaken to provide the needed empirical information to guide policy on the development of price and output trend of ginger in Nigeria. The objective of this study was to analyze the price and output trend of ginger in Nigeria for the period 1990 – 2020.

## **METHODOLOGY**

### **The Study Area**

This study was conducted in Nigeria. Nigeria is located in West Africa on the Gulf of Guinea and is one of the largest countries in Africa occupying a geographical area of about 923,770 square kilometers with an estimated population of 223,804,632 going by the population growth rate of 2.4% (United Nation, 2022). It lies along latitudes  $4^{\circ} 1'$  and  $13^{\circ} 9' N$  and longitudes  $2^{\circ} 2'$  and  $14^{\circ} 30' E$ . It is bounded by the Atlantic Ocean to the south and by the Sahel countries of Niger and Chad to the North. Nigeria operate operates Federal system of government with 36 States and Federal Capital Territory and 774 Local Government Areas (LGAs). Nigeria, by virtue of its location, enjoys a warm tropical climate with relatively high temperatures throughout the year, and two seasons; the rainy or wet season that lasts from mid-March to November in the South and from May to October in the North, and the dry season that occupies the rest of the year.

## **METHOD OF DATA ANALYSIS**

Secondary data such as price and output of ginger were sourced from Food and Agriculture Organization website (FAO) and National Agricultural Extension Research Liaison Services (NAERLS). The data collected were analyzed using descriptive statistics such



as percentage, frequency distribution, mean and standard deviation and graph using E-views version 10 statistical software.

## RESULTS AND DISCUSSION

### Trend of Ginger Price and Output

Figure 1 and 2 indicates that during 1990-2020 period, the trend analysis of ginger price (in naira) and output in Metric tonnes (MT) depict an upward and downward trend during the period under review. More so, various factors appear to have triggered the structural changes of the series such as; forces of demand and supply, random variation and various policies and programmes of government which appears to be the most important cause of the changes in both prices and output of ginger (Olukunle, 2013; Zhang *et al.*, 2019).

Beginning from 1990 there was decrease in price of ginger from 150/kg to 145/kg in 1992. However, there was seemingly sharp increase between 1993 and 1995, while maintaining an average price of ₦200/kg in the year 1996 and 1997 respectively. This increase in price was accompanied by a corresponding increase in output from 64000 MT in 1993 to an appreciable value of 69,000 MT/ha in 1994, and fluctuated from 70,000 MT/ha in 1995 to about 85,000 MT/ha in 1996, with a marginal dropped of 84,000 MT/ha in 1997. The increase in price and output was due to the fact that the period falls within the first phase of Structural Adjustment Programmes (SAP) and beyond, which covered from 1986-1994. The impact of structural adjustment on agricultural exports, particularly of the cash crops was remarkable, because a good portion of total agricultural production was diverted to exports during the period of SAP, as there was new price incentives arising from the improved marketing conditions and currency depreciation which boosted local earnings (Mbum and Ederewhebe, 2019). Generally, Producer prices of all export commodities have increased substantially, during SAP. Cotton, cocoa and palm kernel producer prices for instance increased by an average of 117.0 %, 61.7 % and 55.0 % respectively during SAP (1986 - 1994) compared with the increases of 11.1%, 9.6% and 12.0 % recorded respectively before SAP (1975 - 1985) (Egbuomwan, 1996).

Between the period 1998 and 2005, there was marked increase in price from ₦460/kg reaching a peak of ₦690.90/kg and fluctuated downward from 2006 to 2009. While, the output continues to witness increase from 128,100 MT/ha in 1998 to a tremendous value of 142,000 MT/ha in 2,000. The increase in output has been attributed to ginger maintaining its good price. Notably, fluctuations of ginger prices affect ginger farmers' production decision, because farmers have to be aware of market prices to make their production plan accordingly. Prices in the market are formed based on supply and demand principles rather than production costs. More so, Farmers consider the previous years' price for making their production plan. Price is a determinant factor to output as farmers will always display a Cobweb attitude to be able to achieve a dynamic equilibrium as a result of change in price. Marcuzzo (2020) postulated that, expected price is the latest actual price and that conditions prevailing today will be maintained in all subsequent time periods. Adaptive expectations mean that people formed their expectations about what will happen in the future based on what has happened in the past. It implies that the current expectation is a geometrically weighted moving average of past observations. That is, people revised expectation depending on past errors and farmers in the developing countries mainly rely on the adaptive expectation (Nerlove model).

In addition, there was government intervention in Root and Tuber Expansion Programme (RTEP) in 1999 which also triggered the trend during that period. Although output fluctuated from 2001 to 2004 which coincided with the period 2000- 2009, where yields in Nigeria decreased from 1.820 % to 1.519 %, and almost all the countries (except Egypt,



Indonesia and Vietnam) have observed yields below the average for the world. This problem of low productivity was more or less a general one and needs to be address to ensure continuous supply of adequate amounts of output.

Furthermore, in 2001 a new policy was prepared (FRN, 2001) and implemented during the period of strategic planning exemplified by National Economic Educational Development Strategy (NEEDS) I and II (2001-2007). The era witnessed the Presidential Initiatives aimed at developing selected agricultural commodities and it was followed by the Seven-Point Agenda (2007-2010) that witnessed the preparation of the Food Security Strategy Document in 2009 which started to emphasize the need for a value chain approach to agricultural development. These strategic planning periods also featured the formulation of sub-sector-specific policies such as the Land Resources Policy to guide sustainable use of agricultural lands, National Agricultural Mechanisation Policy, National Cooperative Development Policy, and the National Seed Policy which assigned primary responsibility for commercial seed supply to the private sector while Government would be responsible for foundation and breeder seed development, seed certification, quality control and certification while at the same time providing the enabling environment for accelerated development of the seed industry.

However, the price fluctuated between 2006 and 2008, likewise the output also observed a similar trend. The price differential coincided with the period of 2007-2008 global food crisis. The initial causes of the late-2006 price spikes included droughts in producing nations and rising oil prices. Oil price increases also caused general escalations in the cost of fertilizers, food transportation, and industrial agriculture. This is in line with (Tangermann, 2011; Hepburn *et al.*, 2021) who report that accumulation of events, partially due to oil price shocks, contributed to the 2007/08 and 2010/11 global food price spikes. Even after 2008, prices of many crops continued to rise in Nigeria.

The result further reveals an appreciable rise in price of ginger to about ₦610/kg in 2010, but declined to ₦385/kg and ₦379.54/kg in the year 2011 and 2013, while the output rose from 260,179 MT/ha to 413,382 MT/ha even though there was price decline. The increase in output was as results of increase in land area and improved technologies. This finding collaborate with (Borlaug 2007; Fan *et al.*, 2012) who opined that technological change improves productivity on existing agricultural land as well as additional land area used. The price of ginger in the country somehow trended upward between 2014 and 2015 with a marginal dropped of ₦524.70/kg 1n 2016. However, the price continues to maintained a steady increased reaching a value of ₦666, 27/kg and ₦683.64/kg between 2017 and 2018, and consequently decreased to ₦500/kg in 2019, and gradually rose to 666.29/kg in 2020. However, ginger output rose consecutively from 2009 to 2016 with sharp dropped in 2017, but rose again from 2018 to 2019, then declined in value in 2020. This increase was as a result of continual Presidential initiative policy in 2011 which focused on some selected agricultural commodities which emphases mainly on the value chain to agricultural development as well as the implementation of the Growth Enhancement Support Scheme (GESS) from 2011 to 2014, which improve farmers' access to modern agricultural inputs at subsidized price with efficient agricultural extension delivery system there by increases in income of the farmers which impacted positively on social wellbeing of the farmers by reducing poverty level resulting to increased production as well as the importance of the sector to the Nigerian economy which place ginger as one of the top (non-oil) export commodities for the country.

However, there are no clear explanations from sector experts regarding the declining trend in 2017, but most believe that the production trend will stabilize over the next few years. This finding is in line with ((Adesugba and Mavrotas, 2016; Choenkwan, 2017; Ihuoma and Dogara, 2018), who report that ginger production served as source of income among farmers





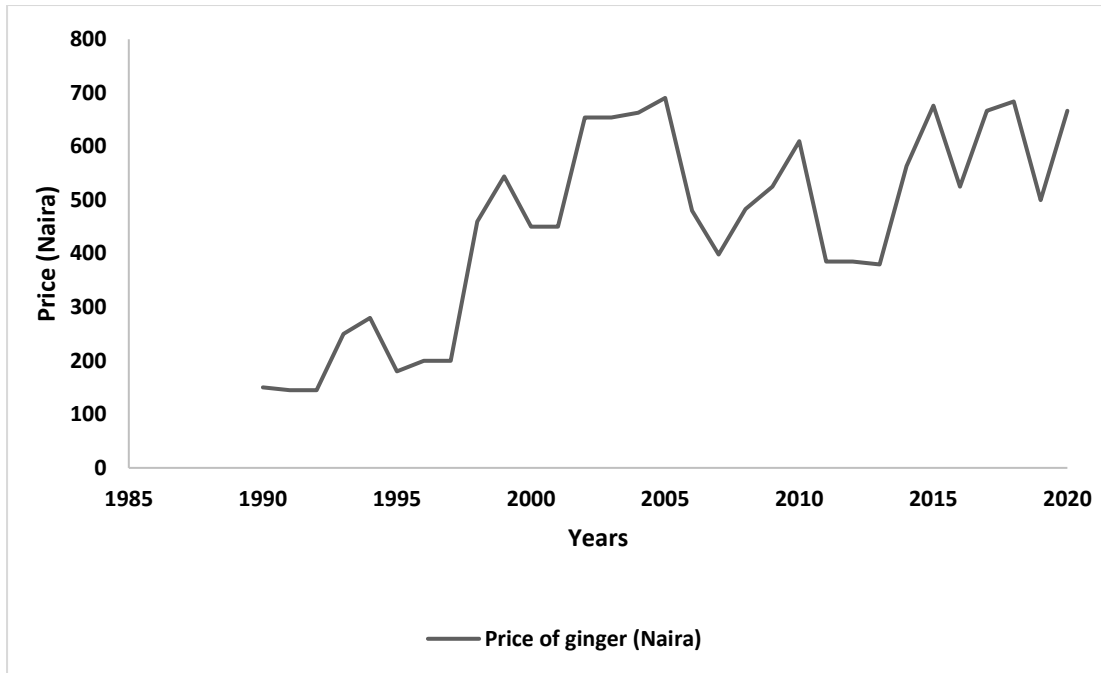
Nigeria. The dropped in 2020 was associated with Covid-19 pandemic which causes disruptions in major activities in the country including agricultural production. This finding is in line with Pakhuan and Sukanlaya, (2021), who report that the price of rhizome seed has increased due to the Covid-19 outbreak and has made travel and transportation more difficult. Middlemen who sell the rhizome seed were unable to enter the area resulting in the price of rhizome seed to increase. This result coincides with previous studies that explain Covid-19 restriction measures have impacted the supply of farm inputs, such as seed and fertilizer, as well as access to extension services. These disruptions adversely affected bean production among rural poor and marginalized groups, cutting them off from output markets (Siche, 2020). In eastern and southern Africa, Covid-19 affected seed distribution to farmers (Nchanji *et al.*, 2021). This effect created disruptions of bean seed systems, which is the crucial crop grown to improve incomes, food, and nutrition security, also influencing health outcomes of resource-poor smallholder households (Nassary *et al.*, 2020). Although there was rise in price of ginger in 2020 compared to previous year, and some experts has attributed it to several factors such as; farmers reduced the area for growing ginger when Covid-19 began to spread around the period of the growing season. This is because they were worried that they would not be able to sell their products because of the lack of markets.

From the result, three major periods have been outlined for Nigerian ginger production over the past twenty years. The first, from 2000-2006, saw a high area of ginger cultivation, averaging 169,857hectares (ha) or 51.3% of the global total, but a low yield, at 6,186 MT/ha. The second period ran from 2007-2014, first with a jump in yields to an average 21,017 MT/ha from 2007-2010 and a decline in area harvested, to just 52,256 hectares, or 20.5% of the world total. This was followed by a brief spike in yields to 54,085 MT/ha in 2011 and rise in area harvested to 2013, before a reversion for both closer to 2007-2010 levels. The third period from 2015 saw yields catching up more sustainably to Asian levels, reaching 82,138 MT/ha as of 2019, while area harvested stabilized, and stood at 80,104 MT/ha in 2019 or 21.8 of the global total. The results from Table 1.1 show some summary statistics, where mean output, minimum output, mean price, minimum price and maximum output, maximum price were analyzed for the data series of ginger. It shows that the ginger has an all-time maximum output of 92,7041 MT/ha and an all-time minimum output of 420000 MT/ha over the considered time period. The all-time minimum price is ₦145/kg while the maximum price is ₦690.50/kg. The results indicate high variability in ginger output and price with standard deviation of 263319 MT and ₦183.2479/kg respectively.

**Table 1: Summary Statistics for Output and Price trend of Ginger from 1990 – 2020**

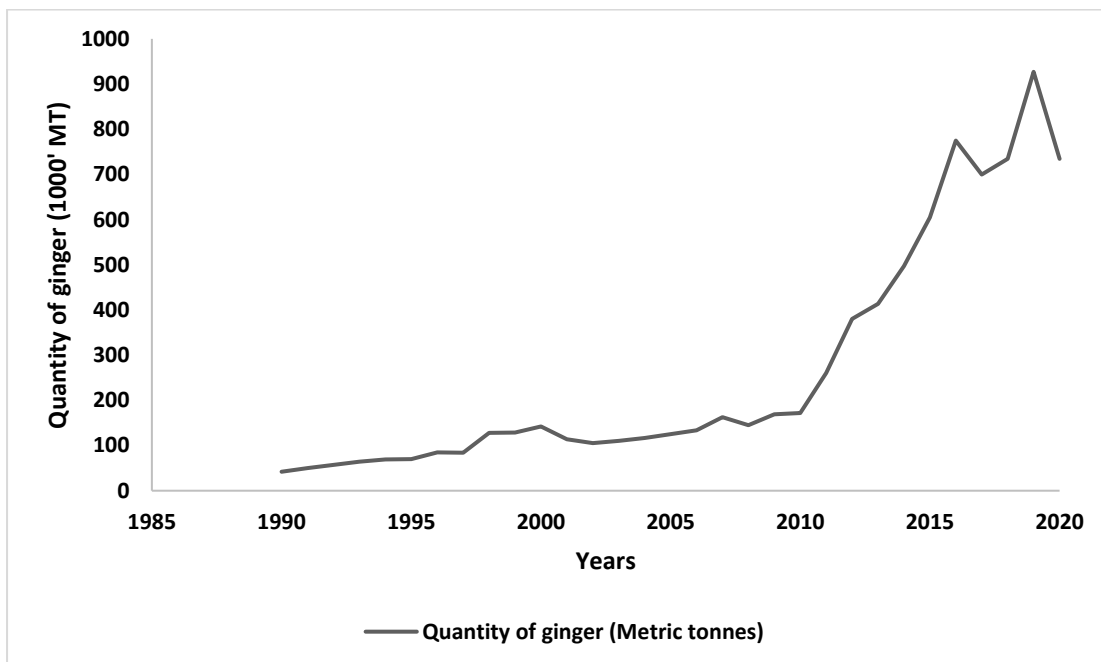
Variables	Quantity (Metric Tonne)	Price of Ginger (Naira)
Mean	267,736.2	452.9490
Median	134,000.0	480.0000
Maximum	927,041.0	690.5000
Minimum	420,000.00	145.000
Standard deviation	263,319.0	183.2479
Skewness	1.216822	-0.35021
Kurtosis	3.007354	1.880598
Jarque-Beta	7.650123	2.280796
Probability	0.021817	0.319692
Sum	8299821	14041.42
Sum Sq.Dev	2.08+12	1007394
Observation	31	31

**Source:** Analyzed from time series data 1990-2020 using EVIEWS 10



**Figure 1:** Time trend of price of ginger from 1990 – 2020

**Source:** National Agricultural Extension Research and Liaison services (NAERLS, 2020); Food and Agriculture Organization Statistics of the United Nations (FAOSTAT, 2020).



**Figure 2:** Time trend of quantity of ginger from 1990 – 2020

**Source:** National Agricultural Extension Research and Liaison services (NAERLS, 2020); Food and Agriculture Organization Statistics of the United Nations (FAOSTAT, 2020).

## CONCLUSION AND RECOMMENDATIONS

The study concludes that there is an upward and downward trend in both prices and output of ginger for the period of the study which covers 1990-2020, the variations observed in prices and output are explained by time and various policies of Government directed toward



agricultural production. Furthermore, this study shows, that there existed a positive growth in ginger supply over the years of studied. By 2020, the amount of ginger produced in Nigeria reached over 734,000 metric tons. Considering the period under study, the peak of ginger production in Nigeria was achieved in 2019, with 927,041 MT. In contrast, to the year 1990, whose has a lower quantity produced to 42000 MT was realized. However, the price maintained a steady increased reaching a value of ₦666, 27/kg and ₦683.64/kg between 2017 and 2018, and consequently decreased to ₦500/kg in 2019, and gradually rose to 666.29/kg in 2020 with a significant increase in output.

Based on the findings, following recommendations was make to maximize the potential of ginger in Nigeria:

- i. More effort should be put in the production of ginger as the past productions affect the future quantity produced.
- ii. Formation of more public/private digital commodity marketing boards like AFEX to complement those abolished during SAP period, in order to improve effective marketing and pricing policy that would increase farmer's sensitivity to price movement at various market.
- iii. More Government commercialization policy that will identified ginger as potential focal crop for the export market should be created and implemented consistently to maintain steady pattern in ginger production.

## REFERENCES

- Abah, D. A., Mbanasor, J. A. and Agwu, M. N. (201 8). Analysis of factors influencing the choice ofmarketing outlets by ginger farmers in Kaduna State, Nigeria. *Journal of Agriculture and Food Environment*, **5**(3):38-47.
- Adesugba, M. and Mavrotas, G. (2016). Deliving Deeper into the Agricultural Tranformation and Youth EmploymentNesus: The Nigeria Case, Nigeria Strategy Support Program Working Paper 31, Washington DC: *International Food Policy Research*.
- Atolani, O., Baker, M. T., Adeyemi, O. S., Olanrewaju, I. R., Hamid, A. A., Ameen, O. M. and Usman, L. A. (2020). COVID-19: Critical discussion on the applications and implications of chemicals in sanitizers and disinfectants. *EXCLI Journal*, **19**, 785
- Ayodele, T. J. and Sambo, B. E. (2014). Ginger (*Zingiberofficinale* Roscoe). Production Efficiency and Constraints among Small-Scale Farmers in Southern Kaduna. *Nigeria. Journal of Agricultural Science*, **6**(8):141-148.
- Choenkwan, S. (2017). Mysterious ginger: Enclaves of a boom crop in Thailand. *Forest and Society*, **1**(2):144-153.
- Ernst, E., and Pittler, M. H. (2000). Efficacy of ginger for nausea and vomiting: a systematic review of randomized clinical trials. *British journal of anaesthesia*, **84**(3):367-371
- Evbuomwan, G. O. (1996). An Empirical Analysis of the Prices of Nigeria's Agricultural Export Commodities. *CBN Economic and Financial Review*, **34**(1):501-522
- Ezra, D., Akinola, M. O., Banta, A. L., Makarau, S. B. and Hussaini, A. (2017). Socio-economic assessment of ginger production in Jaba Local Government Area of Kaduna State, Nigeria. *Asian Journal of Agricultural Extension, Economics and Sociology*, **15**(2):1-11.
- Food and Agriculture Organization. (FAOSTAT), (2018). Retrieved from <http://www.fao.org/faostat/en/#data>. Accessed 15 Nov, 2019.
- Hepburn, J., Omari-Motsumi, K., Smaller, C. and Zoundi, Z. (2021). *How Could Trade Policy Better Address Food System Shocks?* International Institute for Sustainable Development.



- Ihuoma, A. A. and Dogara, M. (2018). Impact of ginger production on poverty alleviation in Kaduna State, Nigeria. *Journal of Economics and Finance*, 9, 37-44.
- Mahassni, S. H. and Bukhari, O. A. (2019). Beneficial effects of an aqueous ginger extract on the immune system cells and antibodies, hematology, and thyroid hormones in male smokers and non-smokers. *Journal of Nutrition and Intermediary Metabolism*, 15, 10-17
- Marcuzzo, M. C. (2020). Expectations, Conjectures and Beliefs. The Legacy of Marshall, Kahn and Keynes. In *Expectations* (pp. 53-67). Springer, Cham
- Marx, W., Ried, K., McCarthy, A. L., Vitetta, L., Sali, A., McKavanagh, D. and Isenring, L. (2017). Ginger—Mechanism of action in chemotherapy-induced nausea and vomiting: A review. *Critical Reviews in Food Science and Nutrition*, **57**(1):141-146.
- Mbum, P. A. and Ederewhevbe, I. G. (2019). Economic recovery, growth paradox and agricultural product marketing in Nigeria. *Lwati: A Journal of Contemporary Research*, **16**(3):125-148.
- Nassary, E. K., Baijukya, F. and Ndakidemi, P. A. (2020). Assessing the productivity of common bean in intercrop with maize across agro-ecological zones of smallholder farms in the northern highlands of Tanzania. *Agriculture*, **10**(4):117.
- National Agricultural Extension and Research Liaison Services (NAERLS) (2020). Agricultural Performance Survey of 2020 Wet Season in Nigeria. Pp. 2-297.
- Nchanji, E. B., Lutomia, C. K., Chirwa, R., Templer, N., Rubyogo, J. C. and Onyango, P. (2021). Immediate impacts of COVID-19 pandemic on bean value chain in selected countries in sub-Saharan Africa. *Agricultural systems*, 188, 103034.
- Nmadu, J. N. and Marcus, P. L. (2012). Efficiency of ginger production in selected local government areas of Kaduna State, Nigeria. *International Journal of Food and Agricultural Economics*, **1**(2):39-52.
- Olukunle, O. T. (2013). Challenges and prospects of agriculture in Nigeria: the way forward. *Journal of Economics and sustainable development*, **4**(16):37-45.
- Palatty, P. L., Haniadka, R., Valder, B., Arora, R. and Baliga, M. S. (2013). Ginger in the prevention of nausea and vomiting: A review. *Critical reviews in food science and nutrition*, **53**(7):659-669.
- Siche, R. (2020). What is the Impact of COVID-19 Disease on Agriculture, *Scientia Agropecuaria*, **11**(1):3–6.
- Sodangi, I. A. (2020). Effect of cultivars on the growth and yield of ginger in Kafanchan, Kaduna State, Nigeria. *Science World Journal*, **15**(4):132-134.
- Sunday, M., Charles, D. and Kinsleg, O. A. (2014). Increasing Production efficiency of Ginger for Poverty alleviation in Kaduna State Nigeria: A stochastic frontier approach. *International Journal of Development and Sustainability*, 7, 1468-1476.
- Sujianto, S., Iriani, E. S., Setiadi, A., Syukur, C. and Rizal, M. (2021). Pursuing sustainable ginger production and supply performance in Central Kalimantan Province. In *IOP Conference Series: Earth and Environmental Science* (Vol. 892, No. 1, p. 012063). IOP Publishing
- Tangermann, S. (2011). Policy solutions to agricultural market volatility: A synthesis.
- United Nation (UN, 2022). World population prospects 2022, Department of Economic and social Affairs, Population Division.
- Zhang, X. X., Liu, L., Su, C. W., Tao, R., Lobont, O. R. and Moldovan, N. C. (2019). Bubbles in agricultural commodity markets of China. *Complexity*, 2019.