

### Trend and trade potentials of ginger export in Nigeria

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**Abstract** - Ginger (*Zingiber officinale*), a high-value crop with significant economic potential, has experienced fluctuating export levels due to Nigeria's infrastructural challenges, market volatility, and competing international producers, such as India. This study examined the trends and trade potential of ginger exports in Nigeria. Utilizing quantitative research methods, data were collected from the World Bank, CEPII Database, and UNCTAD. Descriptive statistics, time-series, and gap analyses were employed to investigate the historical trends and assess Nigeria's ginger export potential in key international markets. The results highlighted Nigeria's fluctuating ginger export performance, with significant variations in production and export volumes over time. Historical data from 2014 to 2022 showed volatility in export values, reflecting global demand shifts and domestic challenges like infrastructural deficiencies. Additionally, the analysis of trade potential further revealed export gaps in key markets, including the United Arab Emirates (0.0280658), the United States (0.7111641), India (0.2998686), Netherlands (0.0423501), Spain (0.8434551), South Africa (0.3006455) and Germany (0.1363955), where actual exports fall short of their potential in markets and the predicted trade volumes suggested room for expansion.

The study concludes that, while Nigeria has substantial trade potential for ginger, achieving consistent export growth requires targeted interventions to address logistical challenges, improve quality standards, and enhance market access. By focusing on strategic markets and investing in supply chain infrastructure, Nigeria can better leverage its ginger exports to support economic growth and increase its presence in the global ginger market.

**Keywords:** Ginger exports, trade potential, trade potentials, trade barriers, trade diversification

### INTRODUCTION

Ginger (*Zingiber officinale*) is an annual herbaceous plant which is extensively grown for its aromatic, pungent rhizomes, utilized in both traditional and modern medicinal systems and as a spice (Ravindran and Babu, 2016). Ginger is a key cash crop and a substantial source of revenue for smallholder farmers in Nigeria, making the country one of the world's top producers of the vegetables (Okwu and Oluafor, 2021). In Nigeria, ginger (*Zingiber officinale*) is a significant economic crop and it is one of the ten most widely grown crops. Nigeria's northern states account for the majority of the country's ginger production; the top producers are Kaduna, Gombe, Benue, Nassarawa, and Plateau (Akpan and Iniloh, 2020).

Nigeria is one of the world's largest producers of ginger, an important agricultural commodity known for its diverse uses in food, beverages, medicine, and cosmetics (FAO, 2020; Olaniyi, 2017). Nigeria, particularly in areas like Kaduna, has the ability to produce high-quality ginger with distinctive flavors and smells thanks to its rich, fertile land and ideal temperature, which makes it a fierce competitor in international markets (Adegbeye *et al.*, 2021).

However, despite this high production potential, Nigeria's ginger export sector has not reached its anticipated performance. The sector faces volatility, reflected in export values and inconsistent trade flows (Adeoye and Dada, 2019). Key challenges include logistical inefficiencies, trade barriers, currency fluctuations, and competitive pressures from other countries, especially India, the world's leading ginger exporter

(Ogunsina and Emeka, 2019). As a result, Nigeria's ginger sector fails to capitalize on high-demand international markets, such as Europe and North America, leading to underutilized trade potential and reduced economic benefits.

Therefore, this study evaluated the trends in ginger production and exports in Nigeria and trade potential of Nigerian ginger exports in key international markets

### METHODOLOGY

The study area is Nigeria, located in West Africa. The country's northern region, particularly Kaduna State, is known for high-quality ginger production due to favorable environmental conditions (NBS, 2022).

This study used a quantitative research design, which is suitable for analyzing numerical data on trade trends and determinants. Quantitative methods provide an objective approach to understanding the relationship between variables affecting ginger export performance (Creswell, 2014).

Data were collected from the World Bank, CEPII Database, and UNCTAD.

Descriptive statistics and time-series analysis were used to examine historical data. Gap analysis and comparative analysis were used to assess the trade potentials of ginger export in Nigeria.

### RESULTS AND DISCUSSION

#### Ginger export in Nigeria

The descriptive statistics presented offer a comprehensive view of the variables influencing

ginger production and export from Nigeria. The mean production value of 631,857.31 tons, with a standard deviation of 197,847.94, highlighted the large-scale production of ginger in Nigeria, with values ranging from 168,128.24 to 834,634 tons. The average export value of ginger is 1492.309 (in \$1000s), with a wide standard deviation of 2599.073 and a maximum export value of \$11,136. This high variability indicates a large disparity in the value of ginger exports across different periods or destinations. The mean quantity of ginger exported stands at 961.051 tons, with a significant standard deviation of 1821.848 tons. The wide range, from 0.42 tons to 11,740.38 tons, again emphasizes the variation in Nigeria's export volumes. These figures suggested that while Nigeria has the capacity to export large quantities of ginger, export volumes can be erratic. According to Nwokolo *et al.* (2019), this inconsistency can be attributed to both internal factors such as logistics and supply chain inefficiencies, as well as external factors such as trade regulations in destination countries.

The GDP of Nigeria has a mean of 4.544e+11 (approximately \$454.4 billion), with a moderate standard deviation of 5.489e+10. The relatively small variation in Nigeria's GDP during the observed period indicates a stable macroeconomic environment, though growth has been modest. However, the GDP of destination countries, however, shows a much higher mean of 2.401e+12 (approximately \$2.4 trillion) and a large standard deviation of 4.843e+12, indicating significant variability in the economic size of

Nigeria's trading partners. This broad range (from \$10.06 billion to \$23.59 trillion) reflects the diversity of Nigeria's trading partners, from smaller economies to major global markets. Larger GDP destination countries generally imply greater purchasing power and demand for imports, which correlates with higher export values.

The average population of the origin country (Nigeria) has a mean of 198.6 million, with a relatively small standard deviation of 12.68 million, reflecting Nigeria's large and growing population, which serves as both a labor force for ginger production and a domestic market. In contrast, the population of destination countries varies widely, with a mean of 159.3 million and a standard deviation of 384 million, ranging from 1.31 million to 1.417 billion. This significant variability suggests that Nigeria exports ginger to both smaller markets and populous nations such as China and India, where the demand for agricultural products is high (Nguyen, 2018).

The mean distance between Nigeria and its trading partners is 5936.624 kilometers, with a standard deviation of 2971.657 kilometers, ranging from 105.18 kilometers to 15,521.28 kilometers. The wide range suggests that Nigeria exports ginger to both nearby countries (e.g., Benin) and distant markets (e.g., China). According to Lawal *et al.* (2021), distance is a significant determinant of trade costs, which include transportation, logistics, and insurance expenses. Greater distances generally increase these costs, making Nigerian ginger less competitive in distant markets.

**Table 1: Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
Production	207	631857.31	197847.94	168128.24	834634
Ginger Export Value	207	1492.309	2599.073	1	11136
Quantity	207	961.051	1821.848	.42	11740.38
GDP (Origin)	207	4.544e+11	5.489e+10	3.757e+11	5.742e+11
GDP (Destination)	207	2.401e+12	4.843e+12	1.006e+10	2.359e+13
Population (Origin)	207	1.986e+08	12684075	1.794e+08	2.185e+08
Population (Destination)	207	1.593e+08	3.840e+08	1311134	1.417e+09
Distance	207	5936.624	2971.657	105.181	15521.28
Exchange	207	210.199	205.991	.321	1132.923
Landlocked	207	.087	.282	0	1
Regional Trade Agreement	207	.087	.282	0	1
Common official language	207	.261	.44	0	1
Common colonial	207	.13	.338	0	1
Contiguity	207	.043	.204	0	1

Source: Author's computation, 2024

**Historical trends and patterns of ginger production, exports, and their contributions to Nigeria's GDP**

**Historical Trends of Ginger Export Value in Nigeria (2014–2022)**

The figure 1 below depicting the historical trends of ginger export values in Nigeria from 2014

to 2022 revealed significant volatility in export performance during this period. Between 2014 and 2016, ginger export values showed pronounced spikes and declines. The year 2014 began with low export values, followed by a significant upward movement. By 2015, export values experienced a remarkable surge, reaching a peak above 9,000

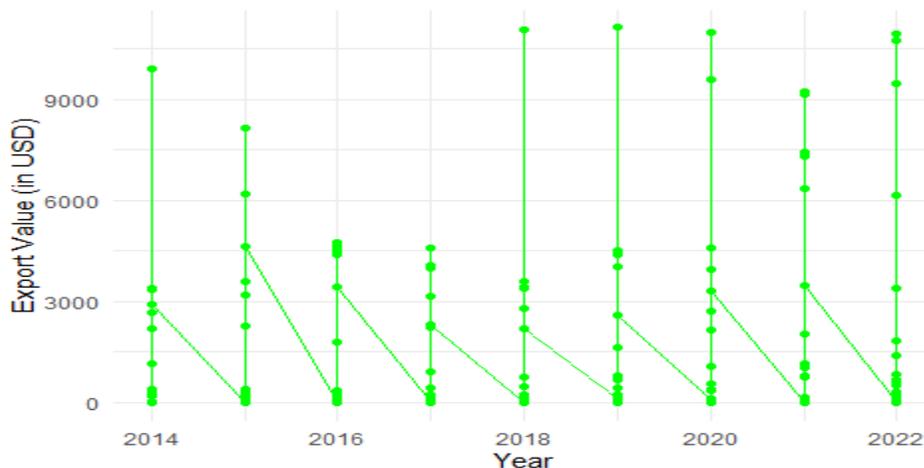
USD. However, this is quickly followed by a dramatic fall in 2016. The high volatility during these years can be attributed to changes in the global demand for ginger, as well as variations in domestic production. According to Olayinka *et al.* (2017), ginger prices and export values are strongly influenced by global market conditions, with demand for spices and herbs rising sharply due to increasing global interest in natural remedies and health products.

From 2017 to 2019, the graph showed relatively moderate export values, with occasional peaks, suggesting a period of consolidation after the extreme volatility witnessed earlier. While the export values did not reach the peaks observed in 2015, there are still discernible increases in certain years, such as 2018 and 2019. The fluctuations seen within these years are still indicative of Nigeria's ongoing challenges in fully capitalizing on its ginger export potential. As Bolarinwa and Gbadebo (2019) noted, Nigeria's export market has been constrained by several factors, including inconsistent trade policies and the volatility of the naira.

From 2020 onwards, the graph reflected a resurgence in ginger export values, with consistently high peaks each year. By 2021 and 2022, the export values once again approached the levels seen in

2015, reflecting renewed vigor in the ginger export market. This recovery can be partially attributed to the global rise in demand for ginger products during the COVID-19 pandemic.

Despite the overall recovery seen after 2020, the graph still showed noticeable volatility, with sharp dips following each peak in export values. This pattern suggested that while the ginger export sector has shown resilience, it continues to face underlying challenges that prevent sustained and stable growth. Usman *et al.* (2020) emphasized that issues such as poor market access, infrastructure deficits, and the impact of climate change on ginger production continue to hinder Nigeria's ability to maintain consistent export levels. The findings from this graph showed the need for more robust and sustained interventions to ensure the consistent growth of Nigeria's ginger export sector. While the global demand for ginger remains strong, Nigeria's ability to meet this demand on a consistent basis requires further investment in agricultural infrastructure, market access, and trade facilitation. FAO (2022) highlighted the importance of improving agricultural value chains, particularly in the areas of post-harvest handling, storage, and transportation, to reduce losses and enhance the export quality of ginger.



**Figure 1: Historical trends of Ginger export value in Nigeria**

Source: Author's Data Analysis, 2024

### GDP Trend of Nigeria Over Time (2014–2022)

The figure 2 depicting Nigeria's GDP over the period from 2014 to 2022 showed significant fluctuations, reflecting both the country's economic challenges and periods of recovery. From 2014 to 2016, Nigeria's GDP showed a sharp decline, falling from approximately 550 billion USD in 2014 to below 400 billion USD by 2016. This period coincides with the significant drop in global oil prices, which severely impacted Nigeria's oil-dependent economy as noted by Ejiogu *et al.* (2018). The graph showed a notable recovery in Nigeria's

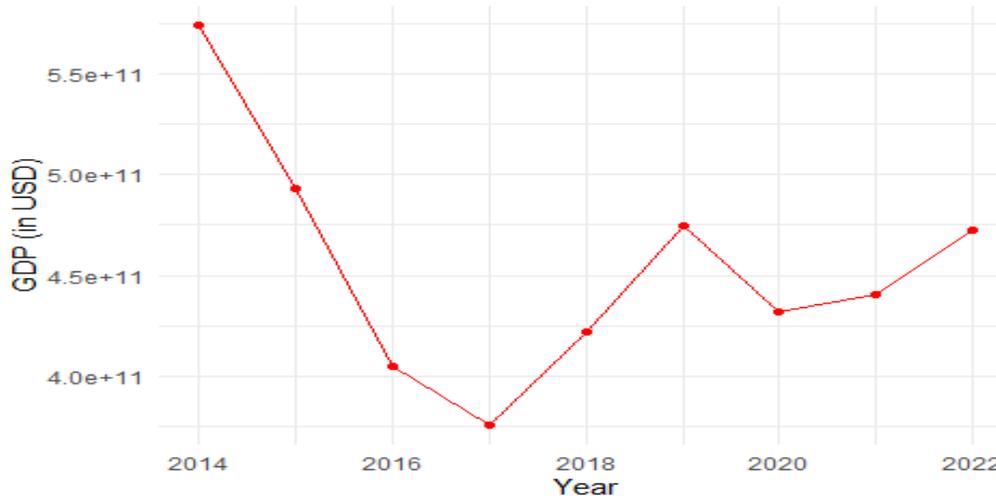
GDP between 2017 and 2019, with GDP rising from below 400 billion USD in 2016 to nearly 500 billion USD by 2019. This recovery can be attributed to the stabilization of global oil prices and efforts by the Nigerian government to implement economic reforms aimed at boosting growth. The GDP decline observed in 2020 is consistent with the global economic downturn caused by the COVID-19 pandemic.

Following the decline in 2020, Nigeria's GDP showed signs of recovery in 2021 and 2022, rising once again to nearly 500 billion USD by 2022.

Ogundipe and Oladeji (2022) argue that Nigeria’s economic recovery in the post-pandemic era has been supported by the global recovery in oil prices, as well as a focus on enhancing agricultural production and boosting non-oil exports. However, the recovery remains fragile, as structural issues such as inflation, unemployment, and insecurity continue to pose challenges for sustained economic growth.

The GDP trends in Nigeria from 2014 to 2022 reflected the broader challenges faced by the

country in achieving stable economic growth. While periods of recovery are evident, the economy remains highly vulnerable to external shocks, particularly fluctuations in oil prices and global economic conditions. Moving forward, Nigeria will need to prioritize economic diversification, infrastructure development, and improved governance to build resilience and promote sustained growth.



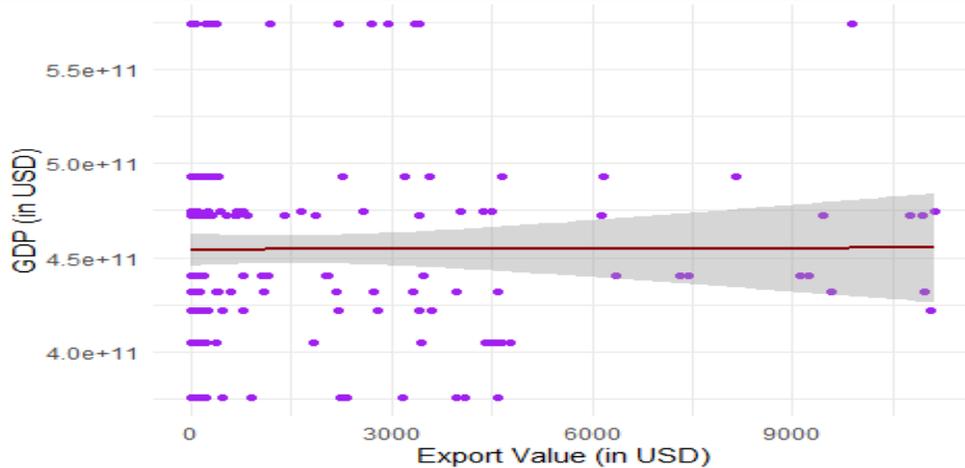
**Figure 2: GDP of Nigeria over time**  
Source: Author’s Data Analysis, 2024

**Relationship between ginger export value and GDP in Nigeria**

The analysis of the relationship between ginger export value and GDP in Nigeria, as illustrated in the scatter plot from figure 3 below, revealed a weak and nearly insignificant correlation between the two variables. The scatter plot showed that even when the value of ginger exports increases, there is no significant corresponding increase in Nigeria’s GDP. This observation is in line with previous research on agricultural export crops in developing countries. For example, studies by Ajayi

and Olu (2019) and Meier (2020) on agricultural commodities in Africa suggested that the contribution of single agricultural products, such as ginger, to overall GDP is often overshadowed by larger industries like oil and gas, especially in resource-dependent economies like Nigeria.

The wide scattering of data points in the graph, particularly in the lower ranges of export values, further reinforced the observation of minimal correlation. This widespread dispersion might be attributed to external economic factors that overshadow the contribution of ginger exports.



**Figure 3: Relationship between Ginger export value and GDP**

Source: Author’s Data Analysis, 2024

**Trade potential of Nigerian Ginger exports**

The analysis of Nigerian ginger exports highlighted significant variations in trade performance across different countries. Nigeria's actual exports fall short of their potential in markets like the UAE, India, Germany, the United States, and South Africa, where trade ratios are much lower than expected. The UAE, for instance, showed a trade

ratio of just 0.028, indicating a large, untapped potential. Similarly, India's growing demand for ginger, especially for health-related uses, offers Nigeria an opportunity to expand its market share. In Europe, Germany is another key market with significant potential, offering high-value opportunities for agricultural exports.

**Table 2: Trade potential of ginger export in Nigeria**

S/N	Countries	Trade Ratio	Trade Differences
1	United Arab Emirates	0.0280658	-6086.216
2	Australia	12.33654	304.1299
3	Belgium	32.75053	109.8819
4	Benin	5.107316	91.53699
5	Bahrain	4.57955	-3.779043
6	Bosnia and Herzegovina	3.441216	22.71954
7	Canada	1.849197	128.2385
8	Switzerland	2.125834	-14.46604
9	China, mainland	84.14978	963.3276
10	Germany	0.1363955	-3969.869
11	Spain	0.8434551	-117.1711
12	France	1.666441	146.0483
13	United Kingdom of Great Britain and Northern Ireland	2.071503	39.2465
14	India	0.2998686	-6008.787
15	Latvia	1.131709	-27.7017
16	Morocco	0.1282915	-2367.701
17	North Macedonia	1.129126	0.2644902
18	Netherlands	0.0423501	-4314.611
19	Norway	8.700646	112.1893
20	Poland	3.705341	190.1231
21	Ukraine	2.217774	110.069
22	United States of America	0.7111641	-991.5822
23	South Africa	0.3006455	-1006.845

Source: Author’s computation, 2024

On the other hand, Nigeria has exceeded its potential in markets like China, Belgium, and Norway, where trade ratios are significantly higher than expected. China, with a trade ratio of 84.15, is overperforming

due to its high demand for ginger, driven by its use in food and medicinal products. Belgium and Norway also show higher-than-expected trade figures, likely due to Belgium's role as a gateway for

agricultural goods in the EU and Norway's strong demand for health foods like ginger.

Some countries, such as Canada and France, have trade ratios close to 1, indicating a balanced performance in line with expectations. These markets present opportunities for further growth, particularly by promoting Nigeria's organic and sustainably sourced ginger products.

#### CONCLUSION AND RECOMMENDATION

The study revealed that Nigeria's ginger exports have experienced significant fluctuations over the years, with major export destinations including Europe, Asia, and North America. The trade potential analysis indicated that while Nigeria has established trade relations with several countries, there remains substantial under-trading with key markets such as the United Arab Emirates, Germany, India, the United States, and South Africa. In contrast, countries like China, Belgium, and Norway showed over-trading, suggesting market saturation or fulfilled demand levels. These findings highlight untapped export opportunities for Nigeria in markets where actual exports remain below potential levels. Despite Nigeria's comparative advantage in ginger production, infrastructural deficits, high logistics costs, and inconsistent quality standards continue to constrain export performance.

Given the study's findings, it is recommended that Nigeria adopt strategic measures to expand its ginger exports, particularly to under-traded markets such as the UAE, Germany, India, the United States, and South Africa. The Nigerian government, in collaboration with export agencies, should invest in improved transport infrastructure, storage facilities, and logistics systems to minimize costs and enhance supply chain efficiency. Additionally, enforcing strict quality control and standardization measures will help Nigerian ginger meet international standards and improve its competitiveness. By implementing these strategies, Nigeria can strengthen its position in the global ginger market, increase foreign exchange earnings, and promote agricultural diversification for sustainable economic growth.

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