



REVIEW ARTICLE

FOOD SUSTAINABILITY IN A POST COVID-19 ERA: THE NIGERIA PERSPECTIVE

Otache Monday Abel^{a*}, Amagbor Stella Chinelo^a, Bosun-Fakunle Yemisi Funmilayo^b, Agbogo Ugbetan Victor^c

^a Department of Industrial Chemistry Michael and Cecilia Ibru University, Delta State Nigeria.

^b Department of Accounting, banking and Finance, Michael and Cecilia Ibru University, Delta State Nigeria.

^c Department of Chemistry, Nigerian Army University, Biu.

*Corresponding Author Email: fillupotache2456@gmail.com

This is an open access article distributed under the Creative Commons Attribution License CC BY 4.0, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

ARTICLE DETAILS

Article History:

Received 11 July 2022

Accepted 17 August 2022

Available online 22 August 2022

ABSTRACT

Nigeria has had periodic food shortages in recent years, to the point where hunger is clearly one of the country's most pressing issues. The escalating insecurity challenges, ranging from Boko Haram in the north to IPOB's demand for a referendum in the south, are blamed for the crisis. Another important aspect is the high number of kidnappings in most rural communities that rely on agriculture for a living, as well as the recent Covid-19 pandemic, which kept all farmers at home for about a year. Agriculture has been Nigeria's greatest non-oil contributor to the national economy, accounting for 41.84 percent of GDP in 2009 and employing about 70 percent of the labour force. However, this projection has recently suffered a setback, with a report from the Bureau of Statistics accounting for 24.45 percent in 2020. In the post-Covid-19 period, Nigeria's economy has shifted from a fight for survival to a struggle for survival hampered by serious insecurity crises. Despite the fact that government measures prohibiting the importation of some food items have had a favorable impact, the unchecked battle between farmers and herders continues to thwart government objectives. Furthermore, the Covid-19 pandemic brought to light the reality that addressing food sustainability will necessitate a collaboration of these elements, as well as more extensive knowledge of Farming Structure (FS), Environmental Issues (EI), Social Issues (SI), and Government Intervention (GI). As a result, this review will look at a correlation between these aspects, evaluating their effects on food sustainability as well as providing important information to address the persistent food insecurity in the contemporary era while also increasing the nation's GDP.

KEYWORDS

Food, Agriculture, Scarcity, Sustainability, Poverty, Zero Hunger

1. INTRODUCTION

Nigeria has recently become a significant food importing country as a result of the agricultural sector's negligence. This act can be traced back to a total reliance on petroleum as a more viable economic development resource (Matemilola and Elegbede, 2017). After the devastation wrought by the Covid-19 pandemic, most people around the world believe that having the correct quality and quantity of food all year is a mirage (HLPE, 2020). Similarly, increased insecurity has been cited as a key setback that has reduced the appeal of many farming approaches, resulting in low profit margins (Matemilola and Elegbede, 2017). Hunger is undoubtedly one of Nigeria's biggest problems right now due to the rising insecurity issues, including Boko Haram in the north and IPOB's quest for a referendum in the south, as well as the numerous kidnapping cases in majority of the local communities that rely on agriculture as a source of income. As a result, there are now more cases of hunger in Nigeria, which is extremely worrying and a negative set-back to the economy (Andam, et al., 2020).

Since Nigeria's independence, agriculture has been a significant factor in the country's economy (Tolulope and Chinonso, 2013). This has followed a consistent pattern of progressive growth from a small-scale level to a stronger commercial system (Matemilola and Elegbede, 2017). According to a study, agriculture in Nigeria contribute 41.84 % to the GDP in 2009 (Maimuna and Benedict, 2015). However, in recent time, this projection has suffered setback with report by the Bureau of Statistics accounting for

24.45 % in 2020 (Aaron, 2022). To reposition the Nigerian economy in the post-Covid-19 era, which is focused on achieving a higher GDP and meeting the required expectations, demand that various cash crops such as cocoa, oil palm, rubber etc., and other major staple foods such as rice, cassava, yams, maize, etc., be harnessed for both domestic and commercial purposes. Likewise other common occupation involving livestock farming are very key to resuscitating the dwindling food crises (Offu, 2013).

In general, the high cost of food in most developing countries may be traced back to a high rate of recession (Christian, 2010). This is said to be the key cause that has pushed low-income earners into a situation where they must spend large fraction of their income (over 70%) to purchase basic food items. As a result, the quest to improve Nigeria's agricultural practices is aimed at ensuring food security (Anselm and Taofeeg, 2010). Similarly, other critical sectors from various social and economic perspectives are also drivers that are crucial tools required to achieve the nation's planned food sustainability objective. One of the tools used to evaluate and characterize food markets in developing economies is to focus critically on macroeconomics, which is based on the GDP pattern as well as the rate of agricultural production. Nigeria's GDP position over the last six years is depicted in Figure 1.

According to Figure 1, periodic population expansion is a major driving force, demanding a desire to focus explicitly on sustainability challenges coming from the food supply value chain (FAO, 2015). The concept of sustainability, on the other hand, considers the environment, profit

Quick Response Code



Access this article online

Website:
www.sfna.org.my

DOI:
10.26480/sfna.01.2022.46.51

margins, and the social status of those engaged (Justice and Sandra, 2019). These factors have influenced the food consumption pattern, which has resulted in a high production of processed foods, which has a significant cost effect and produces a lot of waste (Dwivedi et al., 2017). These practices have further widened the disparity among the rich and the poor in the society (Era et al., 2015). To bridge this gap, the United Nations (UN) has highlighted the importance of sustainable practices based on the following SDGs: zero hunger (SDG 2), good health and wellbeing (SDG 3), and sustainable consumption and production (SDG 12). According to the findings of the study, using a single food criterion as a yardstick for gauging sustainability is insufficient, and numerous factors must be combined to meet consumers' expectations.

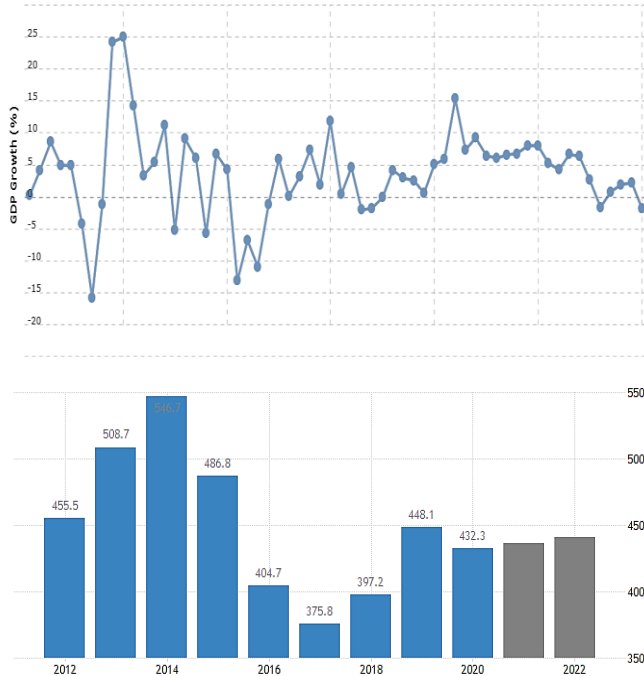


Figure 1: GDP status of Nigeria over the past 6 years (Aaron, 2022).

In addition to the aforementioned, a study by highlighted the government's perspective on ensuring food supply to satisfy local demand and, as a result, improving the well-being of low-income earners (Mozaffarian, 2018). In a comparable report, the factors impacting sustainable food consumption might be based on the minimum living wage, average per capita income, food exports and imports, domestic food prices, and the role of agriculture in GDP (Karen, 2018). More emphasis on the importance of education, household member work, income, household disease, and household health status, according to Burchi and Muro, is a route to food sustainability (Burchi and Muro, 2016). Moreover, other circumstances have been documented to induce a divergence from the established target. To address these issues, a thorough understanding of major elements affecting food shortage (FS) based on farming structure (FS), environmental issues (EI), social issues (SI), and government intervention will be required (GI). Understanding the effects of these elements on food sustainability would provide useful knowledge for addressing persistent food insecurity in the post-Covid-19 period while also increasing national GDP.

2. ENVIRONMENTAL IMPACT (EI)

Environmental factors significantly influence agricultural production and yield (Musa et al., 2019). A number of environment-related challenges are identified to mitigate food security efforts of the Nigerian agricultural system. These include desertification and drought caused by deforestation, pollution, climate change, soil erosion, and floods (Amusa et al., 2019). According to several research, the environmental conditions cannot be isolated from the agricultural yield and productivity. According to the rising food insecurity is associated to flooding (Ogundele, 2021). Although other factors, as reported in related study, highlighted that the impacts of food insecurity could trigger communal conflicts between farmers and herdsmen, thereby leading to insecurity which prohibits farmers from accessing their farms (Echendu 2021a; Furini 2019; Kralovec 2020; Lawal 2020; Ogundipe et al., 2020). Flooding has a significant impact on Nigeria's key food supplies, which include agriculture, fisheries, and aquaculture (Echendu, 2022). While this is going on, accomplishing the SDGs is closely correlated with food availability because it is difficult to work toward reaching the objectives without it.

In order to understand how environmental dilapidation affects productivity and poverty rate in rural communities in Nigeria, Nwokoro and Chima conducted a study (Nwokoro and Chima, 2017). From their findings, minimizing the usage of natural resources was found to be crucial for ensuring long-term environmental preservation. A group researchers conducted research on the factors that influence national food security (Chete et al., 2014). He listed the issues the food industry in the economy was facing, such as inefficient policy, high production costs, high exchange rates, growing population, etc. The report also contends that in order to prevent the nation's high percentage of poverty, food production should be matched to population growth. Environmental deterioration would continue to impede Nigeria's economic progress, according to Akin, in their joint report, unless steps are taken to address the issue (Akin, 1995). People who depend on agricultural resources and land for their subsistence are being forced into poverty because of the economy's continued loss of these sources of income. While some plant and animal species are already extinct, others are in danger due to this issue. Alege and Ogundipe reported that environmental deterioration will increase at an early stage of economic development (Alege and Ogundipe, 2013).

In a collaborative study, noted the emission of greenhouse gases is impacted by climate change (John et al., 2021). Additionally, a group researchers pointed out that the potential of Nigeria to be food secured is anchored on her vast land and natural resources (Romanus et al., 2020). Furthermore, some researchers stated that there exists a relationship between economic development and environmental problems (Adebiyi et al., 2017). However, attribute the danger of malnutrition and possible death to rise in population (Apata, 2018). Insufficient data information has limited the farmers towards better designs and strategies to enhance productivity. Similar to how stated that climate change might potentially halt efforts to achieve a world without hunger as revealed from the study on the implications of climate change on food security in Nigeria (Chaplin et al., 2017).

Agriculture is known to support the livelihood of about 90% of people in the rural communities in Nigeria. Apart from farming, there are other sources of income which are considered complimentary in these rural areas and they, just like farming, also depend hugely on the environmental conditions (IFAD 2010). As reported when describing the economy of the rural communities in Nigeria, there is a common picture painted and that is a picture of a community largely depending on all forms of agricultural production which include hunting, fishing, herbal medicine and farming which cuts across planting, rearing of cattle and animal husbandry (Amusa et al., 2019). All of these activities depend hugely on the environment. When people are undernourished due to a lack of the necessary quantity and quality of food, there is a problem with food security. Additionally, such people lack access to sufficient food for healthy living on a social and financial level (Musa et al., 2019). Based on the nutritional needs of the body for physiological use, food insecurity applies to the consequences of not having the adequate consumption of nutritious food (FAO, 2010). It is imperative to state that for a country to enjoy sustainable food security, its environment (land, soil, climate, water bodies, and vegetation) must be sustainably managed.

Nigeria flares 17.2 billion m³ of natural gas that causes severe atmospheric pollution (Ubani and Onyejekwe, 2013). The flare also contains particulate matter, hydrocarbon and ash. These contaminants acidify the soil and deplete the soil of its fertility and hence reduce the yield and output of famers (Ajugwo, 2013). Although the oil industry accounts for more than 65 percent of government revenue, gas flaring is thought to result in a yearly loss of roughly \$2.5 billion, while the damage to the environment and farming communities is enormous (Ajugwo, 2013). According to the National Bureau of Statistics, the incidence of poverty in the Niger Delta has over the year increased exponentially resulting from countless pollution cases (National Bureau of Statistics, 2004). According to a reflection of this environmental concern has shown a huge impact on the unfortunate poor livelihood of famers as well as having an adverse effect on plant growth and animal health (Nnabuenyi, 2012; Aziz and Iqbal, 2014). Sometimes, as a result of improper disposal of waste, chemicals such as petroleum hydrocarbon, heavy metals, pesticides, fertilizers are discharged into the soil. Ojimba reported that growths of arable crops are always poor in polluted land and soils (Ojimba, 2012).

Any change in the climate over time, whether brought on by natural variability or human activity, is referred to as climate change (IPCC 2001: 2). This has worsened over time and has become a global concern, thereby threatening agricultural production (Ojo and Adebayo, 2012; Ogbo et al., 2013). Several models have been adopted using observation and series of weather data collection to predicted future scenarios (Zewdie, 2014; Berhanu and Wolde, 2019; Wossen et al., 2018; Fudjumdjum et al., 2019). Food production have shown strong correlation to climate change (Jung and Kunstmann, 2007; Wossen and Berger, 2015). A group researcher in

their study, evaluated crop growth and food production (Karimi et al., 2018). Their findings revealed that food production depends on a steady climate and enough clean water resources. In another study, some researchers stated that droughts happen due to climate variability as such poses a threat to fish farming (Ficke, 2007; Muringai et al., 2020). This impact reduces the amount of oxygen as well as lake disappearance (Tirado et al., 2010: 1755). Climate change is a global phenomenon working against efforts being made towards the achievement of the Millennium Development Goals (MDGs) to reduce extreme poverty and food insecurity in developing countries where efforts to build adaptive response is comparatively low (Aondoakaa, 2014). Aondoakaa and Mustapha reported that Agricultural production is particularly affected by climate change (Aondoakaa, 2014; Mustapha, 2009).

According to a study, protein in plant is related to the amount of CO₂ as possible contaminant (Taub et al., 2008). This factor of contamination was reported by accounting for the poor quality of food that has a direct impact on food security and livelihoods (Tirado et al., 2010). Further study revealed a relationship between climate and food contamination (Umlauf et al., 2005; Manuel, 2006). The continuous impact of climate change has affected food productivity in terms of post-harvest losses (FAO, 2008; James, 2010). This has forced the local people to leave their homes, as such exposing them to further food crises. However, in view of the Nigeria context, exploring how climate change has led to food insecurity in Nigeria is of great importance. Therefore, the future of crop yield, agricultural production as well as land availability will be climate dependent. This will have direct impact of food availability therefore resulting to high price of commodities. The impact of this high food prices will dictate the feeding pattern of the least developed population subsequently leading to malnutrition and possible starvation to death.

3. FARMING STRUCTURE (FS)

The availability of food and its security, depends on the cultural practices of local land use as it borders on key decision-makers. Due to the need to further establish a modern agricultural practice in developed countries, the expansion of large-scale farming is a critical path for modernizing agricultural production and ensuring sustainable food production from the social perspective (Ren et al., 2019). Therefore, the quest to harness different ideas relating to changes in agricultural lands, and a transformation of this perspective to enhance food sustainability is timely in the post Covid-19 era. There will be continuous pressure on agricultural land due to population growth and rising demand for food production (Tilman et al., 2011; Godfray et al., 2010). Farming structure in terms of availability and size is a key driver of the food sustainability mandate of the United Nation. Findings according to Alexandratos and Bruinsma, described Southeast Asia and Subsarian Africa as the areas of the globe where hunger is a massive cause of concern (Alexandratos and Bruinsma, 2012). However, recent findings further characterize the high food insecurity in these regions compared to elsewhere in the world (FAO et al., 2020; United Nations, 2019). This was attributed to uncontrolled land degradation that poses a serious setback in farming expected outcome (Millennium Ecosystem Assessment, 2005).

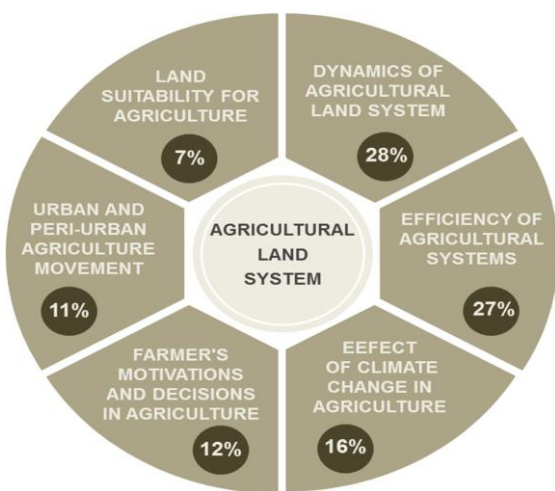


Figure 2: Agricultural land distribution system

From a general perspective, figure 2 highlights the various disposition of the agricultural land system. Report has shown that in Nigeria, there is a rise in industrialization and urbanization that is pegged at massive rural exodus thereby putting much pressure on the use of the available land for the said purposes (United Nations, 2019). Therefore, the need to study the impacts of land usage and practices and how this can affect food security

in the following decades is of great importance (United Nations, 2019; World Bank Group, 2015). Land efficiency study is vital to address SDG 1 (No Poverty) and SDG 2 (Zero hunger) a major area of research evaluated to address food crises (Hong et al., 2019; Mbata, 2001). As shown in World Bank Group report, an increase of 1% in food production reduce 0.48% and 0.72% of the poverty in South Asia and sub-Saharan Africa (World Bank Group, 2015).

Adequate information on available and suitable land for agricultural production is a yardstick to identify the best crop production patterns that will establish and intensify the maximization of food production (EEA, 2017; Shen et al., 2013; Struik and Kuyper, 2017; Wu et al., 2014). A group researchers supported this assertion by noting that land suitability for farming purposes is very relevant to the food sustainability mandate (Akpoti et al., 2019). However, in a study as captured in figure 3, showed an average across all regions and farm types.

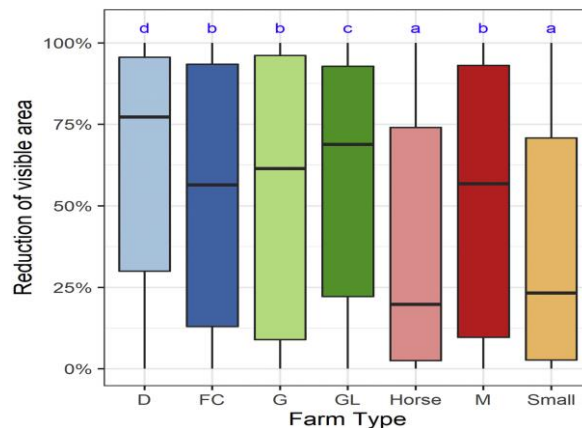


Figure 3: Agricultural distribution farm type

The average reduction in visible area when afforesting fields belonging to a specific farm type. (D: Dairy, FC: Field Crop, G: Granivores, GL: Grazing livestock, M: Mixed)

The Nigeria land usage is represented in Figure 4. This description represents a total area of 92.4 million hectares. Out of the vast land mass, 78 % represents the available agricultural land mass accounting for 71.9 million hectares. This large available land mass has placed Nigeria as a potentially global biofuel contender. However, despite this huge source of opportunity, only a fraction of about 28.2 million hectares is engaged in active agricultural activities.

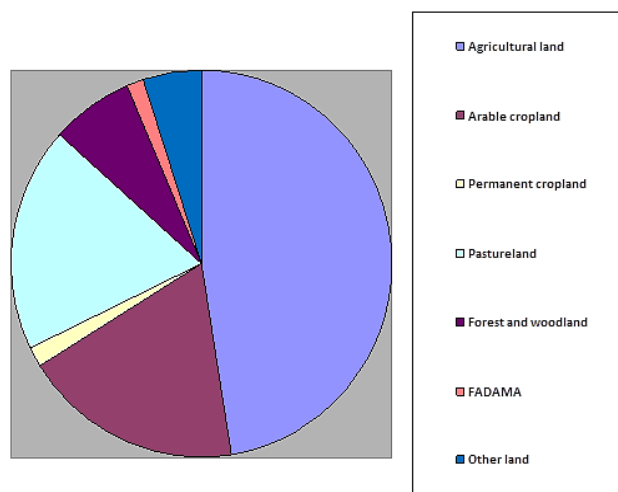


Figure 4: Farm distribution space

Furthermore, tapping into the high-water volume of 267.7 billion cubic meter has positioned Nigeria as a blessed nation with possible projection of a rich vegetation that can support a large population of livestock farming. In addition, the diverse climatic regions (Sahel zone, Guinea Savannah and Derived Savannah zone as well as Forest and Mangrove) is an added advantage to a more robust agricultural prowess. Despite this vast gift of nature, her inability to manage security of the farmers and their farmlands through strict government policies has affected the amount of food production. Also, most local farmers already picture going to the farm as a death trap for kidnappers who demand huge some of ransom to be paid before the victims are released.

4. SOCIAL CRISES (SC)

Negligence to tackle food security has catalyzed the eruption of several social problems across Nigeria. This impact has negatively skewed the social strategic approach towards a better social networking and organized farmer's cooperation. This strategy has presented an escape route for weaker farmers who are important in the supply value chain, thereby enabling them to cope with unpredicted risk. In addition, access to government opportunities through various resource acquisition becomes easy. However, poor access to adequate education in rural communities, has limited the local farmers towards potential access. Therefore, availability of affordable education is an integral requirement by government to address the need to improve the skills of local farmer towards infrastructural access and utilization. The poor availability of these infrastructures (electricity, water, storage facilities, access to market etc.) has hampered farmer's productivity output.

Report by FAO revealed that conflict has potency to trigger food insecurity irrespective of the region (FAO, 2017). However, several studies have reported that the impact of the crises is accessed based on the type of conflict (Martin-Shields and Stojetz, 2019). Most rural areas that have promising agricultural potentials are prone to this crisis (FAO, 2017). Violent conflict has resulted to numerous death and dispersion of most local farmers, thereby accounting for severe man-power shortage (Suthakar and Bui, 2008; Eklund, et al., 2016; Adelaja et al., 2019). Study of conflict on early aged children revealed poor growth development for children living in areas or have experience such violent situation as such have no access to food (Martin- Shields and Stojetz, 2019; George et al., 2020; Bundervoet et al., 2007). The impact of conflict cuts across both individual and national levels resulting to irregularities in markets prices and the proposed valued food chains (FAO, 2017).

Inequality between men and women has also been linked to food insecurity. Women and girls account for 60 percent of the world's chronically hungry individuals, with 98 percent hailing from developing countries (Matemilola and Elegbede, 2017). Women endure a lot of discrimination when it comes to getting quality education and obtaining a career. They face a similar destiny at home, where they are mostly responsible for cooking and caring for the children. In fact, they spend the majority of their income, if not all, on feeding and some basic requirements of their children (Matemilola and Elegbede, 2017). When measuring the impact of a food crisis, women's susceptibility stands out the most (Lloyd-et al., 2015). The role of women in the food value chain cannot be overstated (Otaha, 2013). When compared to men, women are frequently denied infrastructural access. Study by revealed that if women had equal access to resources as males, productivity would increase beyond 20 %, thereby increasing total agricultural output (Otaha, 2013). Most developing countries' food insecurity could have been alleviated as a result of this increase in output. Gender inequality if properly addressed in the food value chain will help to address the concern of food security by enhancing better access to agricultural facilities for women, as well as improve their nutrition and poverty status.

5. GOVERNMENT INTERVENTION (GI)

A group researchers evaluated the comparative impact of government involvement in the agriculture sector on food security (Aliyeva et al., 2019). In their submission, they concluded that, since government investment in agriculture has decreased in most republics of the former Soviet Union, the aggregate volume of agricultural output in these countries has plummeted considerably since 1992. On the other hand, as GDP per capita rises in the majority of countries, the significance of agriculture in the economy is diminishing. Agriculture, on the other hand, has a high share of GDP in countries with a low GDP per capita. They found that determining the "optimal role" of the agriculture sector in the country's economy is critical. They came to the conclusion that the degree of foreign trade liberalization and economic growth have a key role in guaranteeing food security. If the country does not have a competitive advantage in the agricultural sector, there is no need to make it a strategic priority or enhance government intervention, and global trade liberalization is a better option for food security.

A group researchers looked on the link between government intervention and food safety in China (Zhang, et al., 2021). They examined the connections between government involvement and food safety performance under two scenarios of local government competition and noncompetition, using Chinese province panel data from 2005 to 2015. Without taking into account local government rivalry, the findings demonstrate unfavorable relationships between food safety performance and government action. Furthermore, it was discovered that government interference not only impedes regional food safety progress, but also has a negative geographical spillover effect on food safety in nearby provinces.

This study presented fresh evidence regarding the relationships between government intervention and food safety, as well as some incisive policy implications for food safety governance. Some researchers investigated the influence of government rice procurement intervention on local farmers (Peshin et al., 2015). According to their findings, the sole socioeconomic component that influences farmers' decisions to sell through government procurement centers is education. According to the report, more education is needed in the area so that farmers can make informed decisions about selling their produce.

Due to an increase in environmental and health problems associated to current practices, sustainable production methods such as organic farming have gotten a lot of attention in recent years. As a result, promoting sustainability frequently necessitates government assistance as a means of encouraging producers to embrace cutting-edge practices. Therefore, the effectiveness of government policy instruments, i.e., taxes, subsidies, etc. will shape the right food sustainability goal. Satyanarayan and Govinda investigated the state and causes of food insecurity in Odisha, as well as government policies to address the issue (Satyanarayan and Govinda, 2017). They proposed that in order to address this drawback, different measures like subsidized distribution of food grains will establish the required nutrition provisioning. However, in general, Nigerians are uninterested in indigenous items due to inferiority complex. The rise of the oil sector has crippled agriculture, as the vast sums of money created by petroleum products has diverted the attention of the government away from agriculture. The government's decision to import food has had a severe influence on local production, especially as oil riches has turned many Nigerian preference for foreign commodities (Otaha, 2013). This, combined with socio-political instability, has resulted in additional degeneration of food accessibility, including civil conflict, declining human resource base etc.

If governments fail to implement these measures, hunger will continue to exist or intensify. Many countries have failed to develop as a result of their failure to adequately administrate laws and initiatives related to food (Matemilola and Elegbede, 2017). This issue can occur when the focus is on policy objectives, frameworks, and institutions without proper consideration of public interest. However, food costs have skyrocketed recently, making imports more and more expensive, causing inflation in the local food market, and thus capitalizing on the circumstances created by the previous government to fool voters. After a while, another bad leader is elected, and lousy governance reigns supreme. In addition, there are sporadic ethno-religious conflicts that have wreaked havoc on Nigeria's economic progress, particularly in the field of food production. The Boko Haram issue more predominant centered in Borno and Yobe states, where farmlands have been turned into battlegrounds and farmers have been exiled to IDPs camps where they must rely on help for survival.

6. ECONOMIC STRATEGIES TO OBTAIN FOOD INSECURITY

Economy policies influences food security. How well a policy is structured will impact on the economic growth as well as food security (Warr, 2014). Therefore, a weak economy is an easy route to food insecurity in a country (Tawodzera, 2011; Musemwa, 2015; FAO et al., 2019). Low income for most developing countries is also a factor that has triggered poor economic policies (FAO, 2019). People who are unemployed fall into poverty, and those who are poor typically rely on the market to buy food. This has severe impact on the people's choice of diet as such reducing the quality of the daily calorie intake. According to some researchers, consumption pattern changes dues to poverty (Leichenko and Silva, 2014). In a related study, food prices have also resulted to food insecurity (Hertel et al., 2010; Smith et al, 2017).

This rise in food prices happens more in countries that rely in exporting agricultural goods, hence are more susceptible to global price instability (FAO, 2019). Sequel to the aforementioned, the impact of food crises is more in developing countries, however the shock can still be felt at global level. The argument as reported by Davis and Geiger noted that the demand for food aid signifies higher food insecurity (Davis and Geiger, 2017). In a related study revealed that the demand of food items showed significant changes even in developed countries (Griffit et al., 2013). Additional research confirmed that people's levels of food security are influenced by their economic circumstances (Browning and Crossley, 2009; Huang et al., 2016). Therefore, irrespective of the region, an economic crisis can hit every part of the Nigeria state if due considerations are not sufficiently adhered to.

7. CONCLUSION

Despite the complete dependence on crude oil with an intension to become an industrialized Nation, our local industries have suffered a huge setback with incessant fold-up due to lack of basic raw materials. This is

evident in our weak presence in the global financial market. The nation in the past was reckoned as giant in palm oil production, but over the year of complete negligence, this sector has reversibly made the Nigeria system relying on importation of same product from countries they once sold seedlings to. Therefore, food sustainability in Nigeria is a diverse issue, ranging from a lack of passion for local products to a perception that they are inferior to imported foods. Similarly, socio-political instability has exacerbated food insecurity by causing economic downturns, surge in kidnapping cases, civil wars, declining human resource bases, gender inequity etc. Conclusively, encouraging sustainability frequently necessitates government assistance in order to encourage producers to embrace cutting-edge agricultural practices in a secured environment.

REFERENCES

- Adebiyi, H.O., Oladimeji, A.B., Gambo, M.D., 2017. Prevention of environmental degradation in Nigeria: A strategy towards sustainable development. *International Journal of Sciences, Engineering and Environmental Technology*, 2 (3), Pp. 17-24.
- Adene, D.F., Oguntade, A.E., 2006. The structure and the importance of the commercial and village-based poultry industry in Nigeria. *FAO, Rome*.
- Akkaya, D., Bimpikis, K., Lee, H.L., 2017. Government interventions in promoting sustainable practices in agriculture. *SSRN Electronic Journal*. doi:10.2139/ssrn.3001342
- Alege, P.O., Ogundipe, A.A., 2013. Environmental quality and economic growth in Nigeria: A fractional co-integration analysis. *International Journal of Development and Sustainability*, 2 (2), Pp. 580-596.
- Akin, L.M., 1995. *The Environmental Challenges In Sub Saharan Africa*. African Technology Foru: Heldref Publications, 37 (4), Pp. 4.
- Aliyeva, L.Z., Huseynova, S.A., Babayeva, S.J., Huseynova, V.A., Nasirova, O.A., Hasanzade, F., 2019. Food security and optimal government intervention level in agriculture (comparative analysis). *Bulgarian Journal of Agricultural Science*, 25 (2), Pp. 12-20.
- Amaechi, L.N., 2018. Food security and sustainable agricultural development in Nigeria. *The International Journal of Social Sciences and Humanities Invention*, 5 (05), Pp. 4765-4768. doi:10.18535/ijsshi/v5i6.01
- Amponsah, L., Hoggar, G.K., Asuamah, S.Y., 2015. Climate change and agriculture: Modelling the impact of carbon emission on cereal yield in Ghana. *Agriculture and Food Sciences Research*, 2 (2), Pp. 32-38.
- Amusa, T.A., Enete, A.A., Okoye, B.C., 2019. A review of Economic and Food Security Implications of Critical Environmental Challenges on Nigerian Agriculture. "National Root Crops Research Institute (NRCRI), Umudike, Abia State.
- Andam, K., Edeh, H., Oboh, V., Pauw, K., Thurlow, J., 2020. Impacts of COVID-19 on food systems and poverty in Nigeria. *Advances in Food Security and Sustainability*, 5, Pp. 145-173. <https://doi.org/10.1016/bs.af2s.2020.09.002>
- Anselm, A.E., Taofeeq, A.A., 2010. Challenges of agricultural adaptation to climate change in Nigeria: a Synthesis from the literature. *Field Actions Science Reports [Online]*, 4.
- Aondoakaa, S.C., 2012. Effects of climate change on agricultural productivity in the federal capital territory (FCT), abuja Nigeria. *Ethiopian Journal of Environmental Studies and Management EJESM*, 5 (4), Pp. 559 - 566.
- Apata, T., 2018. Effects of global climate change on Nigerian agriculture: An empirical analysis. *CBN Journal of Applied Statistics*, 2 (1), Pp. 31-50.
- Ajugwo, A.O., 2013. Negative effects of gas flaring: The Nigerian experience. *Journal of Environment Pollution and Human Health*, 1 (1), Pp. 6-8.
- Aaron, O., 2022. Distribution of gross domestic product (GDP) across economic sectors Nigeria. *Statista*.
- Aziz, U.R., Iqbal, H.H., 2014. Appraisal of ground water quality using index analysis approach. *World Applied Science Journal*, 31 (1), Pp. 07-11.
- Bala, B.K., Alias, E.F., Arshad, F.M., Noh, K.M., Hadi, A.H.A., 2014. Modelling of food security in Malaysia. *Simulation Modelling Practice and Theory*, (47), Pp. 152-167.
- Baumann, M., Kuemmerle, T., 2016. The impacts of warfare and armed conflict on land systems. *Journal of Land Use Science*, 11 (6), Pp. 672-688.
- Benson, D.N., Odinwa, A.B., 2010. Impact of crude oil exploration and production on the yield and Income of Cassava (*Manihot spp*) in Khana Local Government Area, Rivers State, Nigeria. *Africa Journal Agricultural. Research and Development*, 3 (3), Pp. 59-64.
- Browning, M., Crossley, T.F., 2009. Shocks, stocks, and socks: Smoothing consumption over a temporary income loss. *Journal of the European Economic Association*, 7 (6), Pp. 1169-1192.
- Berhanu, M., Wolde, A.O., 2019. Review on climate change impacts and its adaptation strategies on food security in sub-saharan Africa. *AGRISE*, 19 (3), Pp. 145-154.
- Berry, E.M., Dernini, S., Burlingame, B., Meybeck, A., Conforti, P., 2015. Food security and sustainability: can one exist without the other? *Public Health Nutrition*, 18 (13), Pp. 2293-2302.
- Blekking, J., Waldmann, K., Tuholske, C., Evans, T., 2020. Formal/informal employment and urban food security in sub-saharan Africa. *Applied Geography*, Pp. 114.
- Bundervoet, T., Verwimp, P., Akresh, R., 2009. Health and civil war in rural Burundi. *Journal of Human Resources*, 44 (2), Pp. 536-563.
- Burchi, F., De Muro, P., 2016. From food availability to nutritional capabilities: Advancing food security analysis. *Food Policy*, 60, Pp. 10-19.
- Methodology of the climate change knowledge portal CCKP. 2018. Online: https://climate-knowledgeportal.lworbda.nkor.g/t/he/mes/c/ustom/wb_cckp/r-sources/data/CCKP_Metadata_Description_2018.pdf (Last access: 10/06/2020).
- Clover, J., 2003. Food security in sub-saharan Africa. *African Security Studies*, 12 (1), Pp. 5- 15.
- Chaplin, D., Byekwaso, F., Semambo, M., Mujuni, G., Bantaze, J., Nyasimi, M., Wabyona, E., Krishnaswamy, S., 2017. The impacts of climate change on food security and Change, Agriculture and Food Security (CCAFS). Available from: <http://www.cgspace.org/handle/10568>.
- Chete, L.N., Adeoti, J.O., Adeyinka, F.M., Ogundele, O., 2014. Industrial development and growth in Nigeria: Lessons and challenges. *Nigerian Institute of Social and Economic Research (NISER)*, Ibadan
- Christian, P., 2010. Impact of the economic crisis and increase in food prices on child mortality: exploring nutritional pathways. *The Journal of nutrition*, 140 (1), Pp. 177S-81S. <https://doi.org/10.3945/jn.109.111708>.
- Dahlberg, K.A., 1998. The global threat to food security. *The urban age*, 5 (3), Pp. 24-26.
- Davis, O., Geiger, B.B., 2017. Did food insecurity rise across Europe after the 2008 Crisis? An analysis across welfare regimes. *Social Policy & Society*, 16 (3), Pp. 343-360.
- Dwivedi, S.L., Lammerts van Bueren, E.T., Ceccarelli, S., Grando, S., Upadhyaya, H.D., Ortiz, R., 2017. Diversifying food systems in the pursuit of sustainable food production and healthy Diets. *Trends in Plant Science*, 22 (10), Pp. 842-856.
- Echendu, A.J., 2022. Flooding, food security and the sustainable development goals in Nigeria: An assemblage and systems thinking approach. *Soc. Sci.*, 11, Pp. 59.
- Echendu, A.J., Georgeou, N., 2021. Not Going to Plan': Urban planning, flooding, and sustainability in port Harcourt city, Nigeria. *Urban Forum*, 32, Pp. 311-32.
- Effiong, S.A., Etowa, U.E., 2012. Oil spillage cost, gas flaring cost and life expectancy rate of the Niger Delta people of Nigeria. *Advances in Management & Applied Economics*, 2 (2), Pp. 211 - 228.

- Egbetokun, S.O., Ogundipe, A.A., 2016. Attaining EKC in Africa: Why institutions really matter. *Journal of Applied Science*, 11 (9), Pp. 884-890.
- Era, D.N., Kalpana, K., Nujin, S., Frantisek, R., Evridiki, T. 2015. Causes and consequences of income inequality: A global Perspective. *International Monetary Fund*.
- Erokhin, V., Gao, T., 2020. Impacts of covid-19 on trade and economic aspects of food security: evidence from 45 developing countries. *International journal of environmental research and public health*, 17 (16), Pp. 5775. <https://doi.org/10.3390/ijerph17165775>.
- Etuonovbe, A.K., 2009. The devastating effects of environmental degradation a case study of the niger delta region of nigeria. fig working week 2009. *Surveyors Key Role in Accelerated Dev. Eilat, Isreal*. Available from: <http://www.g.net/pub>.
- Furini, G., 2019. The influence of climate change on the escalating communal conflict between Herdsmen and farmers: The case of the Fulani ethnic group in Nigeria. *Janus.Net: e Journal of International Relations*, 10, Pp. 33-52.
- FAO. 2010. *World Food Crisis the price of Neglect*. Rome: Food and Agriculture Organization.
- Federal Ministry of Agriculture and Rural Development (FMARD) Report 2018. Available from: <http://www.fmard.gov.ng/articles>.
- Food and Agriculture Organization of the United Nations. 2015. *Climate change and food security: risks and responses*. ISBN 978-92-5-108998-9.
- Food and Agriculture Organization. 2018. *Evaluation Report for National Special Program for Food Security*. United Nations: Food and Agriculture Organization.
- Food and Agriculture Organization. 2017. *Share of Undernourished People by Sub Regions*. United Nations: Food and Agriculture Organization.
- Food and Agriculture Organization. 2016. *Climate Change Invests in Agriculture, El Nino* FAO. United Nations: Food and Agriculture Organization.
- High Level Panel of Experts (HLPE). 2020. *Committee on World Food Security. Rome. Impacts of COVID-19 on food security and nutrition: developing effective policy responses to address the hunger and malnutrition pandemic*. Committee on World Food Security High Level Panel of Experts on Food Security and Nutrition Rome, September 2020.
- John, L., Michelle, C., David, F., Raymond, P., 2021. Agriculture's Contribution to Climate Change and Role in Mitigation Is Distinct from Predominantly Fossil CO2-Emitting Sectors. *Front. Sustain. Food Syst.*, <https://doi.org/10.3389/fsufs.2020.518039>
- Justice, M., Sandra, R.C., 2019. Sustainable development: Meaning, history, principles, pillars, and implications for human action: Literature review, *Cogent Social Sciences*, 5, Pp. 1.
- Karen, D., 2018. *Louise Sheiner Hutchins Center on Fiscal and Monetary Policy*, the Brookings Institution
- Kralovec, S., 2020. *Food Insecurity in Nigeria*. Malmo: Malmo University.
- Lawal, A., 2020. *Food System Resilience in Nigeria: Farmers Perspective*. Lincoln: University of Nebraska-Lincoln.
- Lloyd-Sherlock, P., Corso, B., Minicuci, N., 2015. Widowhood, Socio-Economic Status, Health and Wellbeing in Low and Middle-Income Countries. *The journal of development studies*, 51 (10), Pp. 1374-1388.
- Magami, I.M., Yahaya, S., Mohammed, K., 2014. Causes and consequences of flooding in nigeria: A review. *Biological and Environmental Sciences Journal for the Tropics.*, 11 (2), Pp. 154 – 162.
- Maimuna, Y., Benedict, A., 2015. Neglecting agriculture and its consequences to the Nigerian Economy: an analytical synthesis. *European Journal of Research in Social Sciences* 3 (3), Pp. 2056-5429.
- Matemilola, S., Elegbede, I., 2017. The Challenges of Food Security in Nigeria. *Open Access Library Journal*, 4, Pp. 1-22.
- Mozaffarian, D., 2018. Role of government policy in nutrition—barriers to and opportunities for healthier eating. *BMJ*; 361: k2426
- Muhammad, S.S., 2012. The Impact of the 2012 Floods on Agriculture and Food Security in Nigeria Using Gis at the United Nations International Conference on Space-based Technologies for Disaster Management: "Risk Assessment in the Context of Global Climate Change", Pp. 7 – 9.
- National Bureau of Statistics. 2004. *Federal Republic of Nigeria Poverty Profile of Nigeria*. Abuja: National Bureau of Statistics.
- Nnabuenyi, U.M., 2012. Impact of Oil Exploration and Exploitation on the Niger Delta Region: Environmental Perspective. In: Akpotor, A.S., Egbob, S.H., Ohwona, A.I., Orubu, C.O., Olabaniyi, S.B. and Olomo, R.O., Editors. *Five Decades of Oil Production in Nigeria: Impact on the Niger Delta*, Centre for Environmental and Niger Delta Studies, Ibadan.
- Offu, A.K.S., 2013. *The Nigerian Dependent Management & Leadership Development in the Post World War II Colonial Nigeria*. Author House, Bloomington.
- Ojimba, T.P., 2012. Determining the effects of crude oil pollution on crop production using stochastic translog production function in Rivers State, Nigeria. *Journal of Development and Agricultural Economics*, 4 (13), Pp. 346 – 360.
- Otaha, I.J., 2013. *Food Insecurity in Nigeria: Way Forward*, 7 (4), Pp. 26-35.
- Pozza, Liana E., Field, Damien, J., 2020. The science of Soil Security and Food Security. *Soil Security*, 1, Pp. 100002.
- Romanus, O., Daniel, U., Chinonye, L.M., Evans, O., 2020. Accountability in agricultural governance and food security in Nigeria. *Braz. J. Food Technol.*, 23. <https://doi.org/10.1590/1981-6723.08919>
- Peshin, R., Sharma, R., Gupta, V., Ajrawat, B., Risam, K.S., 2015. Impact of government intervention in procurement of rice on smallholder farmers in subtropics of jammu. *Agricultural Economics Research Review*, 28 (2) Pp. 263-270.
- Ren, C., Liu, S., Van Grinsven, H., Reis, S., Jin, S., Liu, H., Gu, B., 2019. The impact of farm size on agricultural sustainability. *Journal of Cleaner Production*, 220, Pp. 357-367.
- Satyanarayan, B., Govinda, C.P., 2017. Food insecurity and government intervention for sustainable food access in odisha. *International Journal of Latest Technology in Engineering, Management & Applied Science (IJLTEMAS)*, 4, (2), Pp. 38-46.
- Odetola, T., and Etumnu, C., 2013. Contribution of Agriculture to Economic Growth in Nigeria. The 18th Annual Conference of the African Econometric Society (AES) Accra, Ghana at the session organized by the Association for the Advancement of African Women Economists (AAAWE)
- Ubani, E.C., and Onyejekwe, I.M., 2013. Environmental impact analysis of gas flaring in the Niger delta region of Nigeria. *American Journal of Scientific and Industrial Research*, 4 (2), Pp. 246 - 252.
- Zhang, H., Sun, C., Huang, L., Si, H., 2021. Does government intervention ensure food safety? Evidence from China. *International Journal of Environmental Research and Public Health*, 18 (7), Pp. 3645.