International Journal of Public Administration and Management Research (IJPAMR), Vol. 6, No. 6, August, 2021. Available online at http://journals.rcmss.com/index.php/ijpamr; www.academix.ng
ISSN: 2350-2231(E) ISSN: 2346-7215 (P)

Hannatu Kungaba & Jide Ibietan , 2021, 6(6):1-16

Food Security and Nigeria's Agricultural Promotion Policy: Empirical and Cross-National Review

Hannatu Kungaba & Jide Ibietan, PhD
Department of Political Science & International Relations
Covenant University, Ota-Nigeria.
hannatu.kungabapgs@stu.cu.edu.ng; olajide.ibietan@covenantuniversity.edu.ng

Abstract
The paper investigates Nigeria's attempt at improving food security using the agricultural promotion policy and Sustainable Development Goal 2. It situates the discussion via empirical and cross-national review that juxtaposes Nigeria with seven other countries. The study relied on secondary sources of data, which were textually analysed. It is observable from the review that food insecurity results from a plethora of factors, namely: poor funding of agriculture; top-bottom approach to policy formulation and implementation; inadequate appreciation of the role of science and technology; natural disasters; and human-induced afflictions such as insurgency, banditry and general security deficits within and across national borders. To ameliorate these, strategic planning; robust technology adoption/adaptation; resuscitation of agricultural co-operative societies and funding institutions operating at reduced or free-interest on loans to practising farmers are canvassed by this paper. Other suggestions proffered are capable of redressing food security deficits identified.

Keywords: *Agriculture, Food, Food Security, Policy, Nigeria*

DOI: URL:https://doi.org/10.36758/ijpamr/v6n6.2021/01

1.0 Introduction

Nigeria is often regarded and prides itself as the "Giant of Africa" and this in certain contexts is rightly so with its economy being one of the largest in Africa (Naidoo, 2020). However, the level of poverty remains quite alarming as the National Bureau of Statistics (2019) stated that 40% of the Nigeria's population or almost 83 million people live below the country's poverty line of 137, 430 naira, which when converted is just $381.75 per year. The number of undernourished people in the country as at 2016 was estimated at 14 million (Food and Agriculture Organisation, 2017). According to the Global Hunger Index, Nigeria was ranked 100th among 113 countries on the global list with an overall score of 40.1 based on the indices of availability, affordability, quality and safety, natural resources and resilience (Global Food Security Index, 2020). The country remains a food insecure nation as it relies on the importation of grains, livestock produce and fish. Its agriculture sector began to plunge after the discovery of oil in 1956 and it is yet to fully recover. The effect of the downturn has been gradual but consistent. The state of its economy has also had an effect on the prices, importation and production of food. The food inflation rates as at February, 2021 is the highest the country has experienced since October, 2005 (Trading Economics, 2021).

All human beings need food to live an active and healthy life. It is essential as it helps to provide energy, encourages physical and mental development, maintains life and stimulate growth. Food is invaluable as it improves health and prevents diseases. The lack of adequate consumption of food according to one's age requirements affects bodily functions, causes fatigue, and body mass, weight, and overall metabolisms are affected (Shutterstock, 2019). It also results in frequent illness, reduces labour productivity in a nation, life expectancy and economic growth can be badly impacted (Abdul Manap & Ismail, 2019). According to Matemilola & Elegbede (2017), one out of four persons lacks access to adequate food, numerically this means that almost 240 million people in sub-Saharan Africa do not have access to sufficient food. The authors also

attest to the fact that successive policy failure, poor policy monitoring and implementation affect food security in Nigeria.

Some reports have shown that the insecurity situation in the country also has adverse effects on the nation's food security. The civil insecurity caused by the Boko-Haram insurgency, particularly affecting the North-east region of Nigeria has not only caused the internal displacement of a portion of its population, it has reduced farming activities in the region, limiting market and trade activities (Adelaja & George, 2019). Dysfunctional activities such as the herdsmen-farmer conflicts have also been identified as a major cause of food insecurity in the country. These conflicts have made farmers, especially the female farmers to refrain from farming as they fear being sexually assaulted or being killed. These constraints account for escalating food prices. Eme et al in (Van Den Hoek, 2017) posit that it has also affected the South as the insecurity has made it more difficult to transport food, thereby causing scarcity and making the food available more expensive compared to the former prices. Every child has a right to basic needs like food and shelter, but Nigerian children are at risk of malnutrition due to food deficits, and the Food and Agriculture Organisation (2020) has estimated that in the coming years, more children will be at risk of malnutrition.

In an attempt to rise to the challenge of food insecurity in Nigeria in recent years, the Agricultural Promotion Policy (2016-2020) was formulated. The Agricultural Promotion Policy was targeted at building on the successes and the lessons of the Agricultural Transformation Agenda (2011-2014), ensure food security, substitute for the importation of food, create employment opportunities and diversify the economy. However, the level of food insecurity is still high with a large number of the population experiencing poverty, hunger, malnutrition and death.

2.0 Conceptual Discourse

The Concepts of food, food security and the central government's (Nigeria) efforts at zero hunger using Sustainable Development Goal 2 strategies are presented here.

2.1 The Concept of Food

The benefits of food cannot be understated, food substances do not only keep people alive, they also provide energy for bodily functions, regulate body process and prevent diseases. It provides the body with required nutrients for keeping the immune system active (Burgess & Glasauer, 2004; Pillai, Kinabo, & Krawinkel, 2016). All body functions, metabolism, hormonal, mental, physical and chemical cannot be performed without food, and it is essential for human survival. For this reason, discussions about the importance of food security cannot be easily dismissed. Food exists is in various forms, it is anything edible that is solid, semi-solid or liquid, which when consumed, digested or assimilated in the body, is useful to it. Food can be categorised into various groups based on different criteria varying from its origin, to functions and its nutritional value (Rubin, 2019). By nutritional value, food is subdivided into, carbohydrates, protein, fat, vitamins, water and minerals. By origin, food is divided into plants and animals, which are consumed and provide nutritional value for human beings. By functions, food is classified into energy yielding foods such as cereals, pulses, fats and sugars; body building foods include milk, eggs, pulses; protective foods such as vegetables, milk and fruits.

Food choices are influenced by these factors: culture, social, economic, physical and biological (Monterrosa, Frongillo, Drewnowski, Pee, & Vandevijvere, 2020). Sobal & Bisogni in (Velardo, 2015) identified three approaches used to analyse food choice, the first is the rationalist approach which assumes that human beings make food choices to minimise costs and maximise values; the structuralist approach assumes that environmental factors and social institutions determine the food choices of individuals; the third approach, the constructionist approach assumes that in the process of making food choices, individuals define and interpret the world around them. In recent policy discourse on sustainability and prevention of malnutrition, individual food choices that result in healthy dietary patterns are considered

important for achieving food sustainability targets. Authors like Loring & Gerlach (2019) posit that for food security to be understood as a matter of human health, then the definitions must recognise the differences needed for food security solutions as cultural differences and personal food choices play an important role in creating positive health outcomes through food security.

2.2 The Concept of Food Security

Food Security is difficult to measure because it is broad in terms of the production, distribution and contribution (Okorie, Johnson, Anyanwu, Adiku, & Ochigbo, 2019). According to (Reutlinger, 1983; Idachaba, 2009; Mohammed & Yakubu, 2016), food security is attained when the majority of a population have access to food in adequate quality and quantity at all times, sufficient quantity and quality may be from domestic production or the global food market. This implies that a country or a locality that considers itself food secure must provide food in its best quality and form where consumers are able to satisfy their hunger and consume food in their best forms, these should provide consumers with enough nutrients for body functions, nutrients provided should be sufficient for all body types and nutrient requirements ranging from children to adults. The Food and Agriculture Organisation (2014) asserts that food strategies do not only comprise of food security measures, they also include consideration for the promotion of sufficient quantities of food in good quality, which together make up a healthy diet. Food security entails the following:

1. Ready availability of nutritionally adequate and safe foods.
2. The assured ability to access acceptable foods in socially acceptable ways that excludes scavenging, stealing and resorting to other coping mechanisms (Anderson, 1990).

The above averments buttress the earlier point that in a food secure environment, food is not acquired through ways that are considered unacceptable, food is acquired with dignity. Food security is also defined as physical and economic accessibility to food, physical accessibility to food comprises the easy transportation of adequate food to places of consumption in a corresponding range to the demands and standards put in place for consumers. Economic accessibility on the other hand, is the probability of buying food products by diverse groups of the population in the average price and size in the food market. Food security is the ability of a food-deficit country or households within countries to meet its yearly targeted consumption levels (Salih, 1994). A country is considered to be food secure on a large-scale, if its domestic food production is adequate to meet its domestic food demand. It can also be food secure if the country's balance of payments and currency reserves provide for importing sufficient food (Diaz-Bonilla, Thomas, & Robinson, 2012; Jambor & Babu, 2016).

Food availability can be due to the effectiveness of an agricultural policy, a good harvest in a particular year, massive importation of food or food aids. Food aid can become an economic instrument being used to serve the political goal of a donor country (Uzor, Chukwura & Esieme, 2020). Food aids in some cases discourage the food production activities of recipients. Some scholars believe that the reliance of a country on food aid before its citizens feed is only providing a short-term solution to its food crisis problem and its food security cannot be guaranteed because the food security of such a country is largely determined by the willingness and the ability of the donor country to supply food (Ojo & Adebayo, 2012). The hygiene and safety of food must also be taken into consideration. It may in some instances be produced and processed unhygienically, and could be preserved with unhealthy substances. A country that is considered food secure must be able to provide its citizens with food that will not be harmful to them. The Food and Agriculture Organisation categorises food security into four: availability, accessibility, stability and utilisation (FAO, 2017).

- Food Availability: refers to the availability of required calorie intake at the individual level and the types of calorie available nationally. Calorie intakes vary from individual, body type, age, health conditions and so on. Food available must account for the calorie requirements of individuals.

- Food Accessibility: implies the variables that measure physical infrastructure which enables the transportation of food to the market. It also includes the individual level indicators of whether people have access to the daily required amount of calories.
- Food Stability: has to do with the measurement on dependence of food import, domestic price variability and variation in land equipped with irrigation, heavy reliance on food aids is an indicator that a country may be food insecure, evidence obtained from conflict-ridden and politically unstable countries in the Middle-East and North Africa that rely heavily on food aid shows challenges of food insecurity and malnutrition (United Nations, 2018).
- Food Utilisation: refers to data on primarily anthropometric indicators of whether people are able to use available calories. Relevant data usually includes wasting, stunting and low weight among children.

A rights-based approach to food security connotes that people have the fundamental right to be free from all forms of food deprivation. This approach mandates the state with the responsibility of ensuring that people have physical and economic access to nutritious and safe food to lead healthy and active lives (FAO in Stringer, 2016). The right to food is well stipulated in Article 25 of the Universal Declaration of Human Rights, which provides that "Everyone has the right to a standard of living adequate for the health and well-being of himself and his family, including food, clothing, housing and medical care". The 1966 Covenant on Economic, Social and Cultural Rights (Article 11) submits that:

> 1. The State Parties to this Covenant recognise the rights of everyone to an adequate standard of living for himself and his family, including adequate food, clothing and housing, and to the continuous improvement of living conditions. State Parties will take appropriate steps to ensure the realisation of this right, recognising to this effect the essential importance of international co-operation based on free consent.
> 2. The States Parties to this Covenant, recognising the fundamental rights of everyone to be free from hunger, shall take, individually and through international co-operation, the measures, including specific programmes, comprising: improved methods of production, conservation and distribution of food by making full use of technical and scientific knowledge, disseminating knowledge of the principles of nutrition and developing or reforming agrarian systems in such a way as to achieve the most efficient development and utilisation of natural resources.

On the contrary, food insecurity can exist in a country when food supply is not stable and are irregular, it can be as a result of conflict and instability in a particular area, for example the Boko Haram insurgency in the North-East region of Nigeria has resulted in unstable supply of food and the destruction of agricultural production (Adelaja & Weatherspoon, 2020). Food insecurity may be caused by factors that affect the production of food such as flooding, climate change and environmental changes. Food insecurity results in malnourishment and this has negative impact on the population (Mbow, et al., 2020), typified by deficiency, excess or imbalance in a person's intake of nutrients.

2.3 Sustainable Development Goal 2 and Nigeria's Efforts on Zero Hunger

The Sustainable Development Goals (SDGs) are supranational development goals and targets that were proposed by the international community in 2015, following the first supranational development goals, the Millenium Development Goals. The SDGs were created to guide the actions of every nation in pursuit of a better world (Gil, et al., 2019). The Sustainable Development Goals include all social, economic and environmental dimensions of sustainability. The Millenium Development Goals focused exclusively on developing countries while the SDGs are inclusive of developed countries since collective action is the only way to achieve global advancement without threatening boundaries (Steffen, et al., 2015).

The Sustainable Development Goal 2 aims to end hunger, achieve food security and improved nutrition and promote sustainable agriculture. The eradication of hunger requires the

alignment of the SDG 2 with the four pillars of food security, food availability which involves having food in sustainable amounts, food accessibility which is having the economic and physical means to acquire nutritious diet, food utilisation which means having the adequate dietary intake and the ability to absorb nutrients in the body, and food stability which involves ensuring the consistency of the other three pillars. The principal targets of the SDG 2 are to: end hunger and ensure nutritious and safe food, end all forms of malnutrition, double the productivity and income of small-scale food producers, ensure sustainable food production systems and implement resilient agricultural practices, maintain the genetic diversity of seeds, plants and animals (UN, 2021).

Following the resolution of Heads of States and Governments at the Special Summit of the United Nations held in September, 2015, the Federal Republic of Nigeria's commitment to achieving the 2030 Agenda for Sustainable Development, found expression in the 17 Goals listed in this agenda. However, Nigeria prioritised the SDG 2 which emphasises that the country accords pre-eminence to food security and nutrition in the global development agenda (Ayoola, Ayoola, Okike, Dashiell, & Ogbodo, 2018). To this end, the Nigeria Zero Hunger Forum was inaugurated in 2017 with the former president, Chief Olusegun Obasanjo as its convener and a number of state governors as members.

The Global Hunger Index (GHI) is a tool created to measure hunger at global, regional and national levels, they are used to identify and assess the progress and hindrances to fighting global hunger. Based on the GHI scores of 2000, 2005, 2010, 2018 and 2020, Nigeria's GHI scores went from extremely alarming (≥ 50) to alarming (35.0-49.9) (Otekunrin, Momoh, & Ayinde, 2019). Ayoola et al (2018) posit through a policy situation analysis collected from four states in Nigeria: Ogun, Ebonyi, Sokoto and Benue which the present situation in those states made the targets set for zero hunger unrealistic, unless measures were taken to normalise the policy process. This calls for greater and concerted efforts to address the dismal state of affairs.

3.0 Cross-National Empirical Review on Food Security and Agricultural Policy

According to studies, there are many countries that have utilised agricultural policies to solve food security challenges and many other countries live with food insecurity. This paper reviews the following countries: Rwanda, Finland, South Africa, Israel, India, Ghana, Mexico, Nigeria and Mali. According to the Global Food Security Index (2020), Finland is the most food secure country in the world with an overall food security score of 85.3, South Africa has an overall score of 57.8, Rwanda is ranked 104th with an overall food security score of 38.8, Israel has an overall food security score of 78 and is ranked 8th on the GSFI, India has an overall score of 56.2 and is ranked 71st on the list, Ghana has an overall score of 53, Mexico with an overall score of 66.2, Nigeria has an overall score of 40.1 and is ranked 100th and Mali has an overall score of 52.7 and is ranked 79th. Predicated on the foregoing, this paper presents the following review.

RWANDA

The Rwandan agricultural sector is regulated by the National Agriculture Policy, but its policies and programmes have been institutionalised under the Ministry of Agriculture (MINAGRI). Its policies are embedded in a framework of various international conventions and protocols such as the Millenium Development Goals (MDG), the New Partnership for African Development (NEPAD), Common Markets for Eastern and Southern Africa (COMESA) and the East African Community (EAC) vision 2020, these cover the long term development framework of the government while the Economic Development and Poverty Reduction Strategy (EDPRS), 2007 to 2012; the Plan for Strategic Transformation of Agriculture, Agricultural Mechanisation Strategy (AMS) 2010 to 2015; The National Post Harvest Crop Strategy (2011 -2016) are some of the short term development goals of Rwanda (Alinda & Abbott in Musabanganji, Maniriho, Kayisire , & Nyalihama, 2019).

The government of Rwanda recognised the persistence of food insecurity in the country from the rural perspective and formulated policies to improve the situation, also the government placed agricultural production and food sufficiency at the top of its agenda (Chigbu, Ntihinyurwa,

De Vries, & Ngenzi, 2019). The Rwandan government introduced the Land Use Consolidation (LUC) measures since 2008 as part of the Crop Intensification Programme (CIP) to meet food security by boosting national agricultural production. It is a matter for debate whether the Land Use Consolidation programme has improved food security in Rwanda, some studies and reports mostly conducted by the Rwandan government claim that the Land Use Consolidation has tripled agriculture yields of priority crop such as rice and thereby increased food availability and food quantity at the national level. On the negative side, Pritchard (2013) disagrees and claims that due to the rapid and forceful implementation of the programme, tenure and agricultural policies are undermining the livelihood stability of rural subsistence farmers.

Studies conducted by (Weatherspoon, Miller, Ngabitsinze, Weatherspoon, & Oehmke, 2019) show that agricultural policies have subsidised poor dietary behaviour since the aggregation of food production has encouraged Rwandan households to sell high quality nutritious foods such as fruits and vegetables; but rural food markets experience low nutrient quality diets since there is little supply of diverse and nutritious food at available prices. Some challenges of the Crop Intensification Programme have been identified at various levels by Musabanganji, Karangwa, & Lebailly (2016), at the institutional level, paucity of financial resources is a hindrance (for smallholder farmers) to increasing agricultural productivity, farmers also have limited access to formal financial services, a significant amount of smallholder farmers in Rwanda have little knowledge on the use of mineral fertilisers and this is reducing the sustainability of their farming practices. The Rwandan government through its input subsidies has been able to sustain its smallholder farmers. The removal of those subsidies threatens the sustainability of small-scale farming intensification.

FINLAND

Finland as a member of the European Union (EU) operates under the Common Agricultural Policy (CAP). The CAP is a core policy of the EU and accounts for almost 40% of the EU budget and a cornerstone of its integration process (Henke, et al., 2017). The CAP was established in The Treaty of Rome in 1957. It aims to increase productivity, enhance the income of farmers, stabilise markets and ensure food supply at reasonable consumer prices (Pe'er, 2020). Finland's agricultural policy has for a long time not only been inspired by economic consideration but also food security. The national objectives of Finland's agricultural policies have been founded on the view that the country is permanently competitively handicapped due to adverse natural and climatic conditions. To this end, the country is continuously compensated and heavily subsidised to ensure its success in the common EU market. Recently, Finland's national calorie intake hovers around 3100kcal per day and its consumption of animal protein and dairy products is 72g a day, which is in fact more than the daily requirement recommended by the Food and Agriculture Organisation (FAO). Finnish agricultural production is able to meet the needs of consumers within the country and the country's self-sufficiency is about 75% (Lehikoinen, Sojamo, & Kummu, 2017), but Finland still imports about two-thirds of the total food consumed because of underutilisation of its vast water and land resources, extreme temperature, daylight variations and a single short growing season.

A number of challenges to the implementation of the Common Agricultural Policy (CAP) in Finland have been identified. Guth, Smedzik-Ambrozy, Czyzewski, & Stepien (2020) submit that the CAP schemes for the support of farms have been more favourable to larger farms as opposed to an equal distribution of support and this is creating disparities within the agricultural sector, they also noted the disparity in agricultural productivity between older European Union states and newer members. This results from the difference in the level of support from direct payments, older members enjoy higher subsidies than the newer members. Lehtonen & Niemi (2018) anticipate future challenges to the CAP implementation in Finland, dairy and beef production based on support payment from the EU and the potential reduction of the CAP budget by 20% would affect prices of agricultural products, the increment in prices will have an effect on food affordability in Finland which would impact food security.

SOUTH AFRICA

In South Africa, about 20.7% of households engage in agricultural activities which is approximately 3 million (Tibesigwa & Visser, 2016). Agriculture does not have the same effect on urban and rural household food security in the country, this is due to reasons such as economic opportunities, population density, access to water and financial markets, security of tenure and so on. These have effect on the agricultural productivity of these areas. The issue of food security has been a top priority for the government of South Africa for a very long time. In comparison to other African countries, South Africa is reasonably food secure having being able to meet the basic nutritional requirements as recommended by the Food and Agriculture Organisation (Masipa, 2017), but there is a disparity in food security levels at national and household levels where majority of the people depend largely on agriculture.

The Bureau for Food and Agricultural Policy is the main policy implementer in South Africa, it collaborates with key local and international partners such as the Bureau of Economic Research (BER), the Food and Agricultural Organisation (FAO) and the Organisation for Economic Cooperation and Development (OECD) on agricultural production, consumption, price fluctuation and trade performance of agricultural value chains in South Africa. The agricultural sector in the country was hit by avian influenza, listeria, drought and other challenges, while its agricultural industries have performed well, the cost of staple food baskets increased by 6% which was driven by maize meal inflation. The National Development Plan (NDP) was formulated as part of the efforts to improve agriculture, institute land reform, integrate and include rural economy and develop human capital. The NDP was expected to create a million jobs. Some of the implementation strategies are: the acquisition of more land, the creation of better irrigation systems and establishment of new schemes, converting underutilised arable land in communal areas, land reform projects, commercial production, granting access to value chains to black farmers, encouraging higher levels of support to black farmers from white farmers and agricultural business companies (Cousins, 2015). The implementation of this policy has encountered various challenges, mechanisation in agriculture has adverse effect on the job security of farm workers, the increase in the import of dumped products from Brazil and European Union has also been a challenge to the implementation of the NDP. Furthermore, these imports are sustained by protective tariffs, the NDP implementation process includes the irrigation of 500,000 hectares of land, but it failed to specify how much of that land will accrue to smallholder farmers, and those who were to be beneficiaries of the land reform.

ISRAEL

Israel in its early decades of existence was considered a developing country, but has since moved past that status, it is now one of the countries ranked in high human development (Endeweld & Silber, 2017). Israel is currently ranked 19th on the Human Development Index (2020) out of over a hundred countries listed, it is also ranked 8th on the Global Food Security Index (2020) based on the criteria of food availability, food affordability, food quality and safety, natural resources and resilience. Israel has managed to increase its agricultural productivity to the extent that food insecurity is no longer a supply-sided problem.

Soon after its independence in 1948, Israel began to address its food security problems through an austerity regime which was also created to address its immigrant problems. The austerity regime rationed food and punished black marketers of food. To this end, food rationing tickets were issued to citizens to ensure that the food rationing policy was implemented to the letter. In 2005, the Knesset which is the Israeli 120-member parliament passed a student daily meal law which stated that children in kindergarten and elementary schools with an extended school day will be provided with a meal a day if the length of the school day is more than 8 hours, and in 2013, the initiative was extended to children living in areas with low socioeconomic status who stay in school till 4pm (Endeweld , Goldsmith, & Endevelt, 2018).

Israel's land resources are not favourable for agricultural activities neither does its climate conditions, but it has managed to navigate through that difficulty. Israel produces 95% of its food requirements and imports the rest, its main imports are oilseeds, grains, meat, sugar,

coffee and cocoa. About 80% of Israel's agricultural activities are based on the activities of cooperative societies who farm on land owned by the state. There are two types of cooperative societies, the first is known as the Kibbutz which is a sparsely populated rural community with a group of inhabitants who are involved in cooperative food production. The second type of cooperative society is the Moshav which is family based, this means that resources are allocated to family farms, resources such as water quotas, farmland and other agricultural inputs. Israel has also been able to successfully incorporate technology in their agricultural process which accounts for their ability to overcome climate, land and manpower challenges. Some of the ways technology has been incorporated is the intense use of greenhouses, computerised irrigation systems, sensors in cattle farms which transmits information on the milk composition and health of the cows (Griver & Fischhendler, 2021). Israel's agricultural sector in recent years has changed from being a planned sector, organised into cooperatives and relying on subsidies to being relatively organised with minimal support and much more competitive (Lewin-Epstein, Siminovich, & Kimhi, 2017).

INDIA

India apart from its agricultural policies have food policies which are used to address food security issues. The National Food Security Act of 2014 is one of the policies formulated by the Indian government to control its malnutrition challenges and to reconfigure the country's food distribution system and agricultural trade policy (Narayanan, 2015). It has a comprehensive legislative framework which is aimed at protecting the rights of every Indian to food. India's high rate of population growth has been one of the greatest challenges to food security. While there has been improvement in the national nutritional status, the progress has been marginally relative to the country's economic growth. The situation in India is what is known as the triple burden of malnutrition, inadequate calorie intake and undernutrition among a large portion of the population, excessive intake of dietary energy leading to obesity and other health-related issues among a section of the population, and prevalent micronutrient deficiencies. Apart from formulating the National Food Security Act (NFSA), the government having identified corruption and inefficiency in the implementation of food programmes adopted a system of cash transfers which was to replace the country's Public Distribution System (PDS).

India's food security problem has been identified to be a problem of food distribution and accessibility not food availability, part of this success is linked to the country's National Food Security Mission which played a key role in increasing food grain production. The country's food distribution and accessibility problem results from high inflation rates on food commodities and the limited access to high quality diets in certain parts of the country. Currently, the problem of imbalanced diets is plaguing India, the country having been able to secure food grain production now struggles with providing a nutritionally balanced system (Pingali, Mittra, & Rahman, 2017). The Public Distribution System (PDS) and the Integrated Child Development Scheme (ICDS) are the main pillars of food-based assistance programmes that the government established in the country. Under the PDS, foods like wheat, rice, sugar are distributed to consumers through Fair Price Shops (FPS), these staple grains are procured by the Food Corporation of India (FCI) from farmers in high producing areas like Punjab and then distributed to these Fair Price Shops. Some challenges facing the National Food Security Act include disparities in the nutritional requirement of adults which differs from children, this means that children suffering from malnutrition live in households where adults enjoy sufficient calories. For India to improve its nutrition status, there are certain problems it has to consider, one of these is the reduction in the rate of diseases caused by improper infrastructure, this must be resolved to improve nutrition and food security (Desai & Vanneman, 2017).

GHANA

Ghana's agricultural sector is its largest source of employment and it predominantly consists of small-holder farmers. The current challenges that the country faces are human resources and managerial skills constraints, technology development, food security and diversity in agro-

ecology. About 5% of Ghana's population is food insecure and 2 million people are at the risk of being food insecure (Darfour & Rosentrater, 2016). The problem of food insecurity, although experienced in different parts of Ghana is mostly prevalent in Northern Ghana.

The Ministry of Food and Agriculture (MoFA) is the policy formulating and implementing body in Ghana. The Ghanaian government recognised that agricultural development interventions can go a long way in reducing the level of poverty and ensuring food security and development. To this end, a comprehensive policy for agricultural development and poverty reduction was initiated. This is the Food and Agriculture Sector Development Policy (FADSEP II). The Northern Rural Growth Programme (NGRP) is an initiative that the Ghanian government presented specifically to address the problem of food security and poverty in Northern Ghana. Studies conducted by Adu, Yawson, Armah, Abano, & Quansah, (2018) show that there has been an increase in food production and the number of trained farmers which suggests that the training of farmers and agricultural extension agents have concomitantly increased the production of food. Another recent policy of the Ghanaian government to solve its food security issues is the National Climate-Smart Agriculture and Food Security Action Plan of Ghana (2016-2020), the policy document provides the implementation framework for the effective development of a climate-smart agricultural plan. The Climate-Smart policy was formulated after recognising the dangers that climate change poses to all aspects of development including agriculture, this policy was also a result of the Climate Smart Agriculture (CSA) introduced by the Food and Agriculture Organisation (FAO) in 2010. Strategic plans have been effectively formulated under this policy to galvanise climate-resilient agriculture for all the agro-ecological zones in Ghana and to also increase the human resource capacity needed for a climate-resilient agricultural promotion in Ghana. Some studies have shown that Climate Smart Agriculture if implemented properly will be beneficial in the long run for agricultural activities and improve the situation of food security in Ghana, some of the benefits are the reduction of waste in natural resources used for processing, packaging, transporting or marketing food, de-risking the livelihoods, farms and value chains from extreme events and unpredictable weather changes (Zougmore, Laderach, & Campbell, 2021). Some of the challenges faced in the implementation of the National Climate Smart Agriculture in Ghana includes the lack of conceptual understanding of the policy and inadequate financing for implementation.

MEXICO

Mexico also known as the United Mexican States is a country located in the Southern part of North America, to the North it is bordered by the United States of America, to the South and West is the Pacific Ocean, to the South-East, it is bordered by Guatemala, the Caribbean sea and Belize, and to the East, it is bordered by the Gulf of Mexico. It is recognised as the third largest Latin American country (Parkes, 2021). Rainfed maize is known as the cornerstone of agriculture in Mexico and the nutrition base for twenty million people in the country (Murray-Tortarolo , Jaramillo, & Larsen, 2018), but climate change has adversely affected the amount of global rainfall and the seasonality of maize. A study conducted by Torres & Rojas (2018) shows that staple foods like sorghum, rice, maize, soyabeans, beans and wheat saw a negative growth from 1993-2017, while fruits, vegetables and other commercial foods like coffee and sugarcane experienced positive growth.

Mexico relies on imports for foods like meats, soybeans, barley, rice, wheat, corn, and beans. Some of these foods are important for the rearing of animals as what they also feed on. According to Torres & Rojas (2020), the country relied on imports for almost 40% of its food consumption and the importation of pork and chicken increased by 16% and 11% respectively. The reliance on imports for food means that Mexico is vulnerable to changes in international prices, this has also affected the country's food security. To tackle food security problems in Mexico, the government changed its focus to small-scale farmers with less than 20 hectares of land and established three new support programmes. These programmes are targeted at guaranteeing minimum prices for maize, beans, wheat, milk and rice, zero interest rate given to bovine producers with no collateral required and a fertiliser programme which distributes

fertilisers to farmers, the programme of payments is called Production for Wellbeing. The Secretariat of Agriculture and Rural Development (SADER), Mexico's ministry of agriculture has also made arrangements with the International Maize and Wheat Improvement Centre (CIMMYT) and other agricultural producers to provide information to farmers with information on weather forecasts and best practices to adapt to climate change.

A general challenge to the implementation of government policies on food and agriculture in Mexico is the quest to align various government sectors who have different priorities, cultures and stakeholders, there is also the lack of clarity on timescale of risks and benefits. Another issue identified by Mozaffarian (2018) is inadequate budget for the implementation of these promising strategies and policies, the government is encumbered with the problem of achieving balance between participant choice and health promotion in the area of food assistance programmes established by the government.

NIGERIA

Nigeria is one of the most populated countries in Africa with a huge number of people living in extreme poverty and experiencing food insecurity (Ayinde et al, 2020). The problem of food insecurity has been linked to unfavorable climate, insurgency in the North-east region, corruption, poverty, farmer-herder crisis and so on. Agricultural policies have been one of the ways the government is tackling food insecurity in the country, various policies have been formulated and implemented to improve agriculture and utilise its success in not only boosting the country's foreign exchange or job creation, but to also address food insecurity. Two of the most recent policies are the Agricultural Transformation Agenda (2011-2015) and Agricultural Promotion Policy (2016-2020), both formulated and implemented by the Federal Ministry of Agriculture and Rural Development under two different administrations. The aims of these policies are agricultural productivity and food security. The Agricultural Promotion Policy was formulated to close the gaps in the Agricultural Transformation Agenda and consolidate the successes of the policy (Olomola , 2017). According to reports from Federal Government of Nigeria (2016); Otekunrin & Otekunrin, (2020), the Agricultural Transformation Agenda provided 12 to 14 million smallholder farmers in the country with means-based input subsidies, Commodities Marketing Boards were re-established and formal lending increased from 1% to 6% in 2015. Other programmes established in the recent years to tackle food insecurity in Nigeria are the National Strategic Plan of Action for Nutrition (NPAN) spanning 2014 to 2019, intended to control diet-related non-communicable diseases and strengthen community participation for nutrition interventions, another is the Zero Hunger Initiative (ZHI) targeted at implementing a strategic framework to achieve Sustainable Development Goal on zero hunger. Other social safety net programmes were also implemented to provide the most vulnerable citizens with assistance, ensuring access to food and reducing the incidence of food and nutritional insecurity in the country, these programmes were commissioned by the National Social Investments Programmes (N-SIP). Some of them include the National Cash Transfer Programme (NCTP), National Home-Grown School Feeding (NHSGSF) and N-Power Programme. Despite these efforts, food insecurity is still very high, and this points to the need for more strategic and robust interventions.

MALI

Mali like many other African countries derives its livelihood from agriculture, 70% of its population live in rural areas with their main occupation being agriculture (Anderson & Masters in Sidibe, et al., 2018), but adverse environmental and climatic conditions have affected its food security and the rate of poverty, the country has been able to overcome some of these challenges by using adaptation strategies such as organic fertilisers, change of planting dates and the cultivation of maize varieties that take a shorter duration to grow. The use of crop production to tackle food security issues and this has been a priority of successive governments in Mali. The Malian farming system consists of cotton being the main cash crop, with other crops like millet,

maize, rice, fishing and herding of cattle. The approach to farming in Mali is undertaken to ensure that farming activities are diversified to reduce risk.

Mali like Ghana has undertaken Climate-Smart Agriculture (CSA) programme initiated by the Food and Agriculture Organisation (FAO), the government went ahead to develop the Climate-Smart Agriculture Prioritisation Framework (CSA-PF) to operationalise its provisions in its agricultural system. The aim of the CSA is to sustainably increase agricultural productivity, enhance adaptation, reduce or eliminate greenhouse gas emissions and to enhance national food security and development goals. The Ministry of Agriculture is separate from the Ministry of Livestock in Mali. Several food and agricultural policies have been initiated in recent times to promote food security in Mali, some of which are the Growth and Poverty Reduction Framework: 2012-2017 (CSCRP); the Agricultural Orientation Law, the National Agriculture Investment Plan (NAIP): 2015-2025; the Strategic Framework for Economic Recovery and Sustainable Development in Mali: 2016-2018 (CREDD). The Accelerated Economic Growth (AEG) and Strategic Objective Programme are examples of economic programmes initiated by the government to reduce malnutrition in the country, increase food security, decrease the rate of poverty and increase adaptation to climate change. Under these economic programmes, two federal initiatives namely: the Feed the Future Initiative (FTF) and the Global Climate Change Initiative (GCC) have been introduced to tackle food security challenges. Prior to undertaking a pilot test on the Climate-Smart Agriculture Prioritisation Framework (CSA-PF) programme in Mali, the government identified issues in cost-benefit valuation, identification and prioritisation of climate-smart options and portfolios for investment (Andrieu, et al., 2017).

4.0 Conclusion and Recommendations

The paper highlighted the indispensability of food to human survival and existence, underscoring the need for its availability, accessibility, stability and utilisation as planks for food security. Pivoted on Sustainable Development Goal 2, Nigeria's efforts at attaining zero hunger were discussed, noting that concerted action are required to tackle security deficits, corruption, poor funding for farmers and bureaucratic lapses among several issues. A synopsis of the main points in this paper are presented below.

Nigerian agricultural policies have been one of the ways that government is tackling food insecurity in the country, various policies have been formulated and implemented to improve agriculture and leverage it to boosting the country's foreign exchange, job creation and address food insecurity.

Rwandan agricultural policies have been able to subsidise poor dietary behaviour, noting that increased food production has encouraged its households to sell high quality nutritious foods such as fruits and vegetables. In addition, the government of Rwanda recognised the persistence of food insecurity in the country from the rural perspective and formulated policies to improve the situation.

The Bureau for Food and Agricultural Policy is the main policy implementer in South Africa and it collaborates with key local and international partners such as the Bureau of Economic Research (BER), the Food and Agricultural Organisation (FAO) and the Organisation for Economic Cooperation and Development (OECD) on agricultural production, consumption, price fluctuation and trade performance of agricultural value chains in South Africa.

Israel's land resources are not favourable for agricultural activities, neither does its climatic conditions but it produces 95% of its food requirements through scientific practices and application of technology. Israel also used to be food insecure but it has managed to increase its agricultural productivity to the extent that food insecurity is no longer a supply-sided problem. The agricultural activities are based on two types of cooperative societies who farm on land owned by the state, the first is the Kibbutz which is a sparsely populated group of inhabitants who are involved in cooperative food production, the other is the Moshav which is family-based and resources are allocated to the family farms.

India has food policies which are separate from their agricultural policies to address food security issues, the country's high rate of population growth is one of the greatest challenges to

its food security. However, specific legislations and bureaucratic networks are in place to lessen the effect of food insecurity.

The Mexican government's incentives and strategies at ensuring food security include guaranteed minimum prices for maize, beans, milk, wheat and rice, zero interest rates given to bovine producers with required no collateral and a fertiliser programme, change of focus to small-scale farmers with less than 20 hectares of land to tackle food security problems in Mexico and provision of information on weather forecasts and best practices in adapting to climate change. Majority of Mali's population live in rural areas with agriculture as their main occupation and this converges with the situation in Ghana consisting predominantly of small-holder farmers. Mali is food insecure, but farmers in the country use adaptation strategies such as organic fertilisers, change of plantation dates and cultivation of maize varieties to circumvent adverse environmental and climatic conditions.

One major lesson that Nigeria can learn from food secure countries like Israel and Finland is to emphasise the inclusion of technology in farming activities; adoption of improved agricultural inputs; value chain development; inter-sectoral linkage of agriculture to industries; innovation to overcome precarious environmental and climatic conditions. This paper further recommends increased budgetary allocation and disbursement to practising/actual farmers in Nigeria.

References

Abdul Manap, N. M., & Ismail, N. W. (2019). Food Security and Economic Growth. *International Journal of Modern Trends in Social Sciences*, 108-118.

Adelaja , G. J., & Weatherspoon, D. (2020). Armed Conflicts and Food Insecurity: Evidence From Boko Haram's Attacks. *American Journal of Agricultural Economics 102(1)*, 114-131.

Adelaja, A., & George , J. (2019). Terrorism and Land Use in Agriculture: The Case of Boko Haram in Nigeria . *The International Journal Covering All Aspects of Land Use*, 1-11.

Adu, M. O., Yawson, D., Armah, F., Abano, E., & Quansah, R. (2018). Systematic Review of the Effects of Agricultural Interventions on Food Security in Northern Ghana. *PLoS ONE 13(9)*, 1-17.

Alinda , F., & Abbott, P. (2012). Agricultural Policy and Institutional Framework for Transformation of Agriculture, Economic Development and Poverty Reduction in Rwanda . Kigali: Institute of Policy Analysis and Research.

Anderson, S. A. (1990). Core Indicators of Nutritional State for Difficult-to-Sample Populations. *Journal of Nutrition, 120(11)*, 1555-1600.

Andrieu, N., Sogoba, B., Zougmore , R., Howland, F., Samake, O., Bonilla-Findji, O., . . . Corner-Dollof, C. (2017). Priotizing Investments for Climate-Smart Agriculture: Lessons Learned from Mali. *Agricultural Systems, 154 (1)*, 13-24.

Ayinde , I. A., Otekunrin, O. A., Akinbode , S. O., & Otekunrin, O. A. (2020). Food Security in Nigeria: An Impetus for Growth and Development . *Journal of Agricultural Economics and Rural Development 6(2)*, 808-820.

Ayoola, J., Ayoola, G., Okike, I., Dashiell, K., & Ogbodo, J. (2018). A Policy Situation Analysis for Achieving the SDG 2 (Zero Hunger) Targets in Selected States of Nigeria . 30th International Conference of Agricultural Economists (pp. 1-20). Vancouver: International Association of Agricultural Economists (IAAE).

Bernades Gil, D. J., Pytrik, R., Giller , K., Todman, L., Whitmore , A., & Ittersum, M. V. (2019). Sustainable Development Goal 2: Improved Targets and Indicators for Agriculture and Food Security. *The Royal Swedish Academy of Sciences*, 685-698.

Burgess, A., & Glasauer , P. (2004). Why We Need to Eat Well. In F. a. Organisation, Family Nutrition Guide (pp. 3-49). Rome : Food and Agriculture Organisation . Retrieved from The Family Nutrition Guide: www.fao.org

Chigbu, U., Ntihinyurwa , P. D., De Vries, W. T., & Ngenzi, E. I. (2019). Why Tenure Responsive Land-Use Planning Matters: Insights for Land Use Consolidation for Food Security in Rwanda. *International Journal of Environmental Research and Public Health 16(8)*, 1-24.

Cousins , B. (2015). Through A Glass Darkly: Towards Agrarian Reform in South Africa. In B. Cousins, & C. Walker , *Land Divided, Land Restored. Land Reform in South Africa for the 21st Century* (pp. 1-25). Auckland Park: Jacana.

Darfour, B., & Rosentrater , K. A. (2016). Agriculture and Food Security in Ghana. *2016 ASABE Annual International Meeting* (pp. 1-12). Michigan: American Society of Agricultural and Biological Engineers .

Desai, S., & Vanneman, R. (2017). Enhancing Nutrition Security via India's National Food Security Act: Using an Axe Instead of a Scalpel. *India Policy Forum*, *11(1),* 67-113.

Diaz-Bonilla , E., Thomas, M., & Robinson, S. (2012). Trade Liberalization, WTO, and Food Security. *European Journal of Sustainable Development 1(2)*, 199-22 .

Endeweld , M., & Silber , J. (2017). Food Security in Israel. In Z. Zhang-Yue, & W. (. Guanghua, Food Security in Asia: Why Institutions Matter (pp. 192-256). Tokyo: Asian Development Bank Institute.

Endeweld , M., Goldsmith, R., & Endevelt, R. (2018). The Demographic and Morbidity Characterists of a Population Recieving Food Support in Israel. *Israel Journal of Health Policy Research 7(54)*, 1-12.

Food and Agriculture Organisation. (2004). The Ethics of Sustainable Agricultural Intensification. Rome: FAO Editorial Production and Design Group Publishing Management Service.

Food and Agriculture Organisation. (2018). The Future of Food and Agriculture: Alternative Pathways to 2050. Rome : Food and Agriculture Organisation.

Food and Agriculture Organisation. (2021). Summary of Requirements for Energy and Protein. Retrieved from Food and Agriculture Organisation: fao.org

Food and Agriculture Organsiation, International Fund for Agricultural Development, World Food Programme (2017). The State of Food Security and Nutrition in the World 2017: Building Resilience for Peace and Food Security. Rome: Food and Agriculture Organisation.

Food and Agriculture Organisation, International Fund for Agricultural Development, World Food Programme (2014). The State of Food Insecurity in the Worl*d* . Retrieved from Food and Agriculture Organisation of the United Nations : http://www.fao.org/publications/sofi/2014/en/

Food and Agriculture Organisation, International Fund for Agricultural Development, United Nations Children's Fund,World Health Organisation, World Food Programme. (2015). The State of Food Insecurity in the World: Meeting the 2015 International Hunger Targets: Taking Stock of Uneven Progress. Retrieved from Food and Agriculture Organisation: www.fao.org/3/a-i464e.pdf

Global Food Security Index (2015). Global Food Security Index 2015: An Annual Measure of the State of Global Food Security. London & New York: The Economist Intelligence Unit.

Global Food Security Index (2020, December). Rankings and Trends: Country Rankings 2020. Retrieved from Global Food Security Index: foodsecurityindex.eiu.com

Griver, S., & Fischhendler, I. (2021). The Social Construction of Food Security: The Israeli Case . *Food Security*, 1-19.

Guth, M., Smedzik-Ambrozy, K., Czyzewski, B., & Stepien, S. (2020). The Economic Sustainability of Farms under Common Agricultural Policy in the European Countries. *Agriculture 10(34)*, 1-20.

Henke, R., Benos, T., Fillipis, F. D., Giua, M., Pierangeli, F., & D'Andrea, M. R. (2017). The New Common Agricultural Policy: How do Member States Respond to Flexibility? *Journal of Common Market Studies 56(2)*, 1-17.

Jambor, A., & Babu, S. C. (2016). Food Security and Global Agri-Food Trade . In C. Springer, Competitiveness of Global Agriculture (pp. 7-24). Switzerland : Springer International Publishing.

Lehikoinen, E., Sojamo, S., & Kummu, M. (2017). Challenges in Nordic Food Security- A Case Study of Finland. *3rd International Conference on Global Food Security* (pp. 1-2). Capetown: ICGFS.

Lehtonen, H., & Niemi, J. S. (2018). Effects of Reducing EU Agricultural Support Payments on Production and Farm Income in Finland. *Agricultural and Food Science, 27(1)*, 124-137.

Lewin-Epstein, N., Siminovich, O., & Kimhi, A. (2017). Public Opinion Towards Agriculture and Rural Areas in Israel. *The Hebrew University of Jerusalem 5(16)*, 1-25.

Loring , P. A., & Gerlach, S. C. (2009). Food, Culture, Human Health in Alaska: An Integrative Health Approach to Food Security. *Environmental Science and Policy 12(1)*, 466-478.

Manwaring, M. G. (2017). The Security Lexicon From Westphalia To The Present. *Air and Space Power Journal 29(1)*, 4-12 .

Masipa, T. S. (2017). The Impact of Climate Change on Food Securty in South Africa: Current Realities and Challenges Ahead. *Journal of Disaster Risks Studies 9(1)*, 1-7.

Matemilola, S., & Elegbede , I. (2017). The Challenges of Food Security in Nigeria. *Open Access Library Journal 4(12)*, 1-22.

Mbow, C., Rosenzweig, C., Barlomi, I. G., Benton, T. G., Herrero, M., Krishnapllal, M., . . . Xu, Y. (2020). Food Security. In P. R. Shukla, J. Skea, J. Calvo Buendia , V. Masson-Delmotte , H. O. Portner, D. C. Roberts , . . . J. Malley, Climate Change and Land: An IPCC special report on climate change,desertification, land degradation, sustainable land management, food security and greenhouse gas fluxes in terrestrial ecosystems (pp. 437-550). New York: NASA Technical Supports Server.

Monterrosa, E. C., Frongillo, E. A., Drewnowski, A., Pee, S. D., & Vandevijvere, S. (2020). Sociocultural Influences on Food Choices and Implications for Sustainable Healthy Diets . *Food and Nutrition Bulletin 4(2)*, 60-73.

Mozaffarian, D. (2018). Role of Government Policy in Nutrition- Barriers To and Opportunities for Healthier Eating . *The BMJ 361(k2426)*, 1-11.

Murray-Tortarolo, G. N., Jaramillo, V. J., & Larsen, J. (2018). Food Security and Climate Change: The Case of Rain-Fed Maize Production in Mexico. *Agriculture and Forest Meterology 253-254*, 124-131.

Musabanganji, E., Karangwa, A., & Lebailly , P. (2016). Intensification of Smallholder Agriculture in Rwanda: Scenarios and Challenges Towards A Sustainable Transformation. Addis Ababa: 5th International Conference of the African Association of Agricultural Economists.

Musabanganji, E., Maniriho, A., Kayisire , P., & Nyalihama, C. (2019). Regional Trade and Competitiveness of Rwandan Agriculture: Empirical Analysis of Selected Priority Foodstuffs. EPRN 5th Annual Economic Conference (pp. 1-21). Kigali: Economic Policy and Research Network .

Naidoo, P. (2020, March 4). Nigeria Tops South Africa as the Continent's Biggest Economy. Retrieved from Bloomberg: bloomberg.com

Narayanan, S. (2015). Food Security in India: The Imparative and its Challenges. *Asia & Paciific Policy Studies 2(1)*, 197-209.

Federal Government of Nigeria. (2016). The Agriculture Promotion Policy (2016-2020). Federal Ministry of Agriculture and Rural Development (FMARD). Abuja .

Ojo, E. O., & Adebayo, P. F. (2012). Food Insecurity in Nigeria: An Overview . *European Journal of Sustainable Development 1(2)*, 199-222.

Okorie, C. E., Johnson, B. O., Anyanwu , E. O., Adiku, L., & Ochigbo, J. E. (2019). Mathematic Modelling for Food Security in Nigeria (A Case Study of Taraba State). *International Journal of Research and Innovation in Applied Science (IJRIAS) IV(1)*, 33-38.

Olomola, A. S. (2017). *Ending Rural Hunger in Nigeria: Mapping Needs and Actions for Food and Nutrition Security.* Washington DC: Brookings Institution.

Otekunrin, O. A., & Otekunrin, O. A. (2020). Healthy and Sustainable Diets: Implications for Achieving SDG 2. In L. W. Filho, A. Azul, A. Brandli, P. Ozuyar, & T. Wall, (*Zero Hunger. Encyclopaedia of the UN Sustainable Development Goals* (pp. 1-17). Switzerland: Springer Cham.

Otekunrin, O. A., Momoh, S. A., & Ayinde, I. A. (2019). How Far Has Africa Gone in Achieving Zero Hunger Target? Evidence from Nigeria . *Global Food Security, 22*, 1-12.

Parkes, H. B. (2021, May 3). Mexico. Retrieved from Britannica: britannica.com

Pe'er, G. (2020, March 8). Action Needed for the EU Common Agricultural Policy to Address Sustainability Challenges. Retrieved from British Ecological Society: https://besjournals.onlinelibrary.wiley.com

Pillai, A., Kinabo, J., & Krawinkel, M. B. (2016). Effect of Nutrition Education on the Knowledge Scores of Urban Households with Home Gardens in Morogoro, Tanzania. *Agriculture and Food Security 5(22)*, 1-8.

Pingali, P., Mittra , B., & Rahman, A. (2017). The Bumpy Road from Food to Nutrition Security-Slow Evolution of India's Food Policy. *Global Food Security 15(1)*, 77-84.

Pritchard, M. F. (2013). Land, Power and Peace: Tenure Formalization, Agricultural Reform and Livelihood Insecurity in Rural Rwanda. *Land Use Policy 30(1)*, 186-196 .

Reutlinger, S. (1983). Food Security and Poverty in LCDS . *Finance and Development, 22(4)*, 7-11.

Rubin, M. (2019, December 9). Classification of Foods. Retrieved from Slideshare: slideshare.net

Salih, S. A. (1994). Food Security in East and Southern Africa. *Nordic Journal of African Studies, 13(1)*, 3-27.

Sidibe , A., Totin, E., Thompson-Hall, M., Traore, O., Traore, P. S., & Olabisi, L. S. (2018). Multi-scale Governance in Agricultural Systems: Interplay Between National and Local Institutions around the Product Dimension of Food Security in Mali. *NJAS- Wageningen Journal of Life Sciences 84(1)*, 94-102.

Sobal, J., & Bisogni, C. A. (2009). Constructing Food Choice Decisions. *Annals of Behavioural Medicine (38)*, 37-46.

Steffen, W., Richardson, K., Rockstrom, J., Cornell, S. E., Fetzer, I., Bennett, E. M., . . . Carpenter, S. R. (2015, February 13). Planetary Boundaries: Guiding Human Development on a Changing Planet. *Science 347(6223),* pp. 1-12.

Stringer, R. (2016). *Food Security Global Overview.* Adelaide: University of Adelaide.

Thomas, K., Hardy, R. D., Lazrus , H., Mendez, M., Orlove, B., Rivera-Collazo, I., & Winthrop, R. (2019). Explaining Differential Vulnerability to Climate Change: A Social Science Review. *Wiley Interdisciplinary Reviews: Climate Change, 10(2)*, e565, 1-18.

Tibesigwa, B., & Visser, M. (2016). Assessing Gender Inequality in Food Security among Small-holder Farm Households in Urban and Rural South Africa. *World Development, 88*, 33-49.

Torres, F., & Rojas, A. (2020). Food Security and Regional Imbalances in Mexico. *Prob Des., 50(201)*, 57-83.

(United Nations). (2021). Sustainable Development Goal*s* . Retrieved from Sustainable Development Goals Knowledge Platform: sustainabledevelopment.un.org

Van Den Hoek, J. (2017). Agricultural Market Activity and Boko Haram Attacks in Northeastern Nigeria. *West African Papers, No.9* , 1-20.

Varella, S. (2021, February 11). *GDP of African Countries 2019, By Country*. Retrieved from Statista: statista.com

Velardo, S. (2015). The Nuances of Health Literacy, Nutrition Literacy and Food Literacy. *Journal of Nutrition Education and Behaviour, 47(4)*, 385-389.

Weatherspoon, D. D., Miller , S., Ngabitsinze , J. C., Weatherspoon, L. J., & Oehmke , J. F. (2019). Stunting, Food Security, Markets and Food Policy in Rwanda . *BMC Public Health, 19(1)*, 1-13 .

Zougmore , R. B., Laderach, P., & Campbell, B. (2021). Transforming Food Systems in Africa under Climate Change Pressure: Role of Climate-Smart Agriculture . *Sustainability, 13(8)*, 1-17.