



# **Food Security and Safety: Africans Perspectives A Review**

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## **Authors' contributions**

*This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.*

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## **ABSTRACT**

The challenges of hunger in Africa, caused by food insecurity can only be mitigated by enhanced food security and food safety measures. Food safety has a significant role in ensuring food security. A primary cause of food insecurity is the decline in global food productivity. It is also a problem of poverty which has impacted adversely on the socio-economic life of its citizens. Africa is endowed with land resource that if transformed towards agricultural productivity has the capacity to ensure food security and sustainability. Agriculture, of which 85-90 per cent is rain-fed in sub-Saharan Africa, accounts for 35 percent of the region's gross national product (GNP), 40 percent of exports and 70 percent of employment. Africa needs to leverage on agricultural innovation so as to boost its regional food output. It is essential that production and provision of safe food be given the attention it deserves by addressing the numerous challenges facing it so as to stimulate economic growth and ensure food security and safety in the African continent.

*Keywords: Food security; food safety; agriculture; Africa; nutrition.*

## 1. INTRODUCTION

Food is essential for the sustenance of human life. Our health is subjective by the food we consume. Social and economic activities as well as human health are at risk due to unsafe food. Africa is the world's second largest and second most populous continent, behind Asia in both categories. The continent of Africa is made up of 54 recognized sovereign states [1] Africa needs serious agricultural transformation currently but has to be much more focused on a market driven, business production that encompasses the entire food system, not just agricultural production [2]. By improving agriculture and food markets, there is an opportunity to lift millions of African people out of poverty. Hence, there is an urgent need to chart a course for food safety and security of African populations. Over the years, concerted effort have been made in improving the quality as well as the production of world food supplies, food insecurity remains prevalent particularly in the nations of Africa. African Food Security (AFSB) estimated that approximately one out of every three person in sub-Saharan Africa is undernourished. Achieving sustainable economic development in Africa will be elusive without well nourished and healthy citizens. Food safety is vital in ensuring food security. During the 1996 World Food Summit of November held in Rome, all heads of Government at the summit pledge their support and commitments towards achieving global food security and the alleviation of hunger with the aim of reducing the number of undernourished persons by the year 2015. Despite the food aid by international communities, the challenges of under nutrition still persist in many African nations. It is obvious that changes in global economy, population growth and consumption patterns are having negative consequence on the environment. Over the years, numerous economic reforms have been introduced in many Sub-Saharan African (SSA) countries. Despite the effort, economic growth continues to be on the downward trend impacting heavily on the welfare of the people, especially the rural population. Extreme environmental occurrences such as recurrent drought and floods have seriously affected the socioeconomic life of the people because of its untold effects on agricultural lands. Boon [3]; reported that poor land policies and management practices, which has lead to land degradation and deforestation exposes of our land to the risks of floods. This challenge contributes significantly to decline in agricultural production, poverty and food insecurity. In the year 2000 World Bank

stated that 85-90 percent of agriculture is rain-fed in sub-Saharan Africa which accounts for 35 percent of the region's gross national product (GNP), 40 percent of exports and 70 percent of employment [4]. Annual rainfall is minimal at about less than 700 mm which may not sustain growth of crops.

## 2. CONCEPT OF FOOD SECURITY

The UN Food and Agriculture Organization (FAO) [5] defined food security as a condition whereby all humans have sufficient quantity and quality food for an active and healthy living. Food insecurity in Africa is basically caused by the decline in continents food production. Many authors [6,7,8] shared the view that majority of the population in a country must have access to food in acceptable quality and quantity at all times for such a country to be recognized as food secured. Monitoring food security would provide adequate data for the supply of diverse diets to the African population. According to FAO [4], food security is measured at the national food balance sheets (FBS) and population data. UNEP [9] also noted that, food security has three components which stated that food should be available in sufficient quantities and appropriate quality supplied through domestic production or imports. Food should be accessible by households and individuals for a nutritious diet and optimal uptake of nourishment through a sustainable diet, clean water and adequate sanitation, together with health care.

### 2.1 Access to Food

This refers to economic, social, and physical access to food by all people at all times. It is necessary to note that more food production does not guarantee more food for those who need it. Current levels of agricultural productivity and production say little about potential levels, because they are simply a response to present levels of demand and price/market conditions. It is however important to note that food production is not the same as food availability and that collective availability and the ability to acquire food are very different things. The yield of roots and tubers in Africa is the lowest in comparison to the other regions of the world [10]. Whilst food production indisputably influences food availability, the intricacies are complex. People's access to food depends both on the purchasing power of their income, and on their non-market entitlements, such as rights to land for subsistence farming and foraging purposes. Individuals and households may be compelled to

adapt to a number of strategies to gain access to food. These include: income generating patterns should be sustained; the innovative use of available resources, emigrating from zones plagued by food scarcity. Food entitlements for urban dwellers are most often mediated through the market, whereas for rural dwellers in general and subsistence farmers in particular, these entitlements tend to depend more on the local production. Clearly, food insecurity is basically a problem of poverty, affecting those social groups with the weakest or most fragile food entitlements, both in terms of access to social networks and safety nets. Malnutrition can be a threat to urban and rural dwellers at different times and for different reasons. Urban-rural links are often created in the pursuit of food security, leading to a mutual association between urban and rural dwellers so as to maintain a balance in the food supply system.

## 2.2 Availability of Food Supply

Availability of food plays an essential role in food security. Agricultural output in Africa has not improved since the past five decades. Agricultural output in Africa grows geometrically when compared to the arithmetic growth of its population. This has made Africa to witness an increase in the importation of food and food aid to its continent. Therefore, with such increasing population over its agricultural output, deficiency in the availability of food supply is bound to persist. Agyare-Kwabi [11], estimated that the food gap would increase nine times the present gap by 2020. The outbreak of novel corona virus (Covid-19) pandemic around the globe has further worsened the supply of food in Africa.

## 2.3 Acceptability of Food

The African nation is rich in assorted diets such as tubers-cassava, yams and potatoes, plantain, millet, maize and rice etc. The manner in which food is transformed from raw food into processed food determines to a great extent the acceptability of such food.

## 2.4 Africa's Food Production Potential and Challenges

A Harvard University study led by Professor Calestous Juma showed that Africa could feed itself by making the transition from importer to self sufficiency. Africa needs to leverage on the agricultural innovations so as to boost its regional output [12]. FAO & World Bank [5], in their joint report stated that the land resource in Africa

when intensively cultivated could easily produce another 100 million tons of grain equivalent each year. This potential is evidenced by the low yields Africa currently achieves compared with those of similar agro-ecological zones [5]. The FAO organization [5], estimated that Africa still has a further 800 million hectares of uncultivated land with potential for rain fed crop production, whereas [13], estimated 240 million hectares of uncultivated land. This implies that Africa is endowed with land resource that if transformed towards agricultural productivity has the capacity to ensure food security and sustainability. There is also considerable untapped irrigation potential and remaining uncultivated land that could be brought into production. Evolution from subsistence farming to cash crop farming will offer the opportunity to increase income. Demand for food is growing fast, Ban Ki Moon, the then United Secretary General at a World food summit in Rome in 2009, warned that six million children die of hunger every year; 17,000 die of starvation every day and predicted that by 2050 the world will need to feed two million more mouths. Africa's demand for food is anticipated to more than double by 2050 [2], driven by population growth, rising incomes, rapid urbanization, changes in national diets towards greater consumption of higher value fresh and processed foods, and more open intra-regional trade policies, all of which are helping create new opportunities for Africa's farmers. Agriculture is capable of uplifting millions of people out of poverty. Thirtle et al. [14], suggested that crop farming can uplift poor Africans out of poverty by 0.72 percent. However, despite the opportunities Africa has not utilized modern agricultural practices to maximize these great potentials. Africa will be far from harnessing the rich potentials inherent in the region and will continue to depend on importation if modern agricultural practices are neglected. It was reported that combined annual food import bill is currently about US\$35 billion, and is estimated to rise to US\$110 billion by 2025 [15].

## 2.5 Agricultural Production Trends in Sub-Saharan Africa

Agricultural resources are the key drivers of Africa economies and the descent of these resources threatens both their food security and overall economic well-being. Variations in type, timing and level of agricultural inputs also have a major effect on yield. A low level of inputs is associated with small scale production, capital intensity, manual labour, seed types, low

fertilization, no pest control and small farm areas. A high level of inputs is associated with commercial production, moderate to high capital inputs, increased mechanization, improved seedlings, use of inorganic chemical fertilizer as well as pest control, medium to large farm lands, and accessibility to the market.

## 2.6 Principal Agricultural Systems and their Impact on Food Security

Traditional Agricultural Systems remains one major farming practice in Africa. Farmers of traditional and low-input agricultural systems have long assumed mixed crop farming. Even today, there are still a huge variety of crop combinations cultivated, including cereals, legumes, root crops, vegetables and tree crops.

There is a greater yield in combined cultivation of crops. In Africa, more than 80 percent of all cereals are intercropped, producing, in some cases, highly complex patterns, with up to 20 species grown in close proximity. Intercropping can reduce weed problems, so influence labour requirements, returns to labour can be increased, and erosion and runoff may be reduced because of the greater ground cover given by the mixture. There abound numerous advantages in employing agricultural genetic diversity. Crop genetic diversity provides security for farmers against pests, disease and unexpected climatic conditions. Crop genetic diversity can also help small-scale farmers obtain higher yields than they could with monocropping. Genetic diversity also provides farming communities with a range of products with multiple uses and value.

**Table 1. Farming systems in West Africa**

Zone	Dominant crops		Minor crops	Livestock
	Subsistence crops		Cash Crops	
Humid tropics/rain forest	Yam	Cocoa	Vegetables	Sheep
	Rice	Rubber	Cocoyam	Goats
	Cassava	Oil palm	Tree crops	Poultry
	Maize	Banana	Banana	
	Plantain	Coffee	Sweet potato	
	Cocoyam	Coconut		
Forest/savannah mosaic	Sorghum	Soybean	Cocoyam	Goats
	Millet	Sesame	Cassava	Sheep
	Cassava	Sugar cane	Cowpea	Poultry
	Yam	Cotton	Vegetables	Few cattle and
	Rice	Tobacco	Groundnuts	Horses
Guinea savannah woodland	Sorghum	Groundnuts	Sweet potato	Goats
	Millet	Sesame	Vegetables	Sheep
	Rice	Cotton	Banana	Horses
	Maize	Tobacco	Cassava	Poultry
	Cowpea	Soybean	Tree crops	Pigs
		Sugar cane		Cattle
Sudan and Sahel Savannah	Millet	Groundnut	Vegetables	Goats
	Sorghum	Cotton	Sweet potato	Donkeys
	Cowpea	Some rice	Rice	Sheep
		Wheat	Sesame	Horses
			Tree crops	Poultry
Tropical Highlands	Millet	Arabica coffee	Sweet potato	Goats
	Beans	Tobacco	Hausa potato	Poultry
	Sorghum	Irish potato	( <i>Plectranthus</i> and <i>Solenostemon spp</i> )	Horses
		Tea		Donkeys
		Sub tropical		
		Vegetables		
	Cotton			

Source: Okigbo [16]

However, in the recent times agricultural practices are being limited to single species although varieties have become common. The advent of modern varieties and breeds has almost always dislodged traditional varieties and breeds.

## **2.7 Modern Agricultural Systems**

The process of agricultural modernization has led to the emergence of three types of agriculture: industrialized, Green Revolution, and the traditional systems [3]. The author further noted that industrialized agriculture and Green Revolution are characterized by improved access to roads, urban markets, ports, with ready access to inputs: machinery, marketing infrastructure, transport, agro processing facilities and credit; good soils; adequate supply of water, either through stable rainfall or irrigation systems; access to modern crop varieties and livestock; and access to petroleum-based products and machinery. Shortcomings exist in the in modern agricultural practices which tend to undermine food security and health by exposing the rural poor at a disadvantage, threatening their land tenure, and degrading wild resources. The use of pesticides damage populations of the predators that help keep pest populations under control, as well as other wildlife, which suggests resistance in target pests in some cases. Nitrates from fertilizers and ammonia from livestock wastes raise the metal contents of soils, and pathogens in wastes can harm human and livestock health. The atmosphere is contaminated by ammonia which plays a role in acid rain production, nitrous oxide derived from fertilizers which has key role in ozone layer depletion and global warming. Furthermore methane from livestock and paddy fields also affects the atmosphere causing global warming.

## **2.8 Causes of Food Insecurity**

According to [17], poverty is the greatest challenge facing food security in Africa. It was acknowledged that decline in agricultural productivity, inadequate agricultural policies, poor infrastructure and transport hike, inadequate marketing strategies, frequent extreme weather conditions, soaring disease burden, weak financial support scheme, inadequate safety net systems and political conflicts as factors responsible for prevailing food insecurity in Africa [18]. Conflicts among herdsmen and farmers are major challenge in Nigeria and in some parts of West Africa. Corruption which has necessitated insecurity

also hinders the process of addressing food security and safety in Africa. In some parts of West Africa, farmers have been displaced from their rural or farm settlements due to the activities of bandits and other miscreants. There are concerns that outbreak of pandemic is also a threat to food security. The recent outbreak of novel Corona virus pandemic has threatened the production, availability and supply of food in Africa and other parts of the world.

However, the challenges of food insecurity can be tackled through effective agricultural policies. A comprehensive agricultural development that prioritizes the farmer's needs and tackles poverty with opportunities and education is essential. The government has a key role such as providing sort of incentives, social protection, cash transfers, provision of better but low cost technologies, securing land right, empowering women and other vulnerable groups will assist in better agricultural participation and productivity. This requires involving the rural people in decision making processes of agriculture productivity. The inability of government to involve farmers in defining and designing projects has led to the failure of some of these projects. There should be well designed social protection systems such as risk insurance scheme and community empowerment to help households sustain their resilience to shocks. It is imperative that the land resources used for agricultural production are expanded as well as the water resources used for agricultural irrigation.

Furthermore, the place of research organizations in agricultural productivity cannot be overemphasized. Agricultural productivity can be improved through encouragement of research. Research Institutes should be funded so as to encourage innovation and participatory research. The universities, research institutes and national agricultural research centers are the centers of research in our continent. While remarkable achievements have been made by the various national agricultural research centers towards increased and more diversified food production, there is need for more improved research and more funding of the various research centers. There should be link between the research communities, extension workers and the farmers. This would enhance the dissemination of research findings. There should be storage facilities to enable farmers store their post-harvest crops. Farm products are perishables; farmers are forced to sell their products so

quickly thereby making revenues that do not meet their daily need. The storage facilities can help them preserve their products before taking them to the market for sale. The storage facility will also help provide enough food reserve for the countries of Africa. This will be of immense benefit during food crisis. Expanding the water resources used for agricultural irrigation is also essential in increased agricultural productivity. Improved agricultural biodiversity through improved agricultural practices will also boost food supply [3]. As stated earlier, genetic diversity also provides farming communities with a range of products with multiple uses and value. Due to efforts to increase productivity, natural resources have witnessed undue pressure as well as environmental damage. Varying weather conditions as a result of climate change have played a part in reducing food supply in many African countries. Average crop yields are falling with shorter growing seasons and higher temperatures as well as frequent and severe droughts. Efforts should be made at minimizing climate change through policies that improves food security. Thus, there should be effective management of the environment by reducing the rate of deforestation. Trees planting should be encouraged in our surroundings especially fallow lands. providing habitat for agricultural pests and increasing resilience to shocks and long-term climate change can help in the improvement and management of natural resources. Tree planting should be encouraged because forest trees outside the forest helps in protecting soil and water resources, promotes soil fertility and provides protection from extreme weather events.

### 3. CONCEPT FOOD SAFETY

The safety of the food we consume is essential for a healthy life. It is an important aspect of food supply system which cannot be overlooked. Achieving food safety is a milestone towards food security of any nation. Therefore food security cannot be guaranteed without adequate food safety. Food safety is a term which describes the provision of food in a manner which is devoid from all forms of spoilage, contamination and toxins which could cause harm to the human system upon consumption. Food security and food safety are inseparable because the availability of sufficient food would be needless if such foods are not safe upon consumption and nutritious to meet their dietary needs and food preferences for an active and healthy life.

The 2015 data from the World Health Organization (WHO) suggests that each year, food borne illnesses cause's almost one in 10 people on the planet to fall ill [19]. Some 420,000 deaths a year are believed to result from food borne illnesses, a significant proportion of these in children less than five years old. Unsafe food cannot sustain human health and has dangerous social and economic consequences. Emerging food threats persists; *Aflatoxin* is an instance. The health and economic effects of *Aflatoxin* causes public health concern, especially for the world's poorest countries. The consumption of foods grown with chemical fertilizers and pesticides used in treating diseases of crops which usually find their way in the plants fruits also constitute safety threats. Foods can be contaminated by microorganisms, mycotoxins, heavy metals, pesticide residues, veterinary drug residues and environmental pollutants [20]. These contaminants constitute food safety threats in different parts of the world including Africa. Improving levels of food safety globally requires the development of new technologies, sustainable commitments, and human and institutional capacity, especially among farmers. There is need to enlighten the public on the need to ensure that food are safe and nutritious. W.H.O [19], also reported that contaminated food causes some 230,000 diarrheal deaths each year. It is our hope that with the right food safety knowledge, risk management methods the incidences of food poisoning and food borne illness which are direct consequences of food borne illness would be overcome in the food supply system.

### 4. CONCLUSION

Achieving sustainable food security and safety means ensuring continuous access to food both in quantity and quality for the present generation as well as the future generations. Sustainable and resilient global food security systems must be developed to provide consumers regular access to diverse diets with adequate amounts of nutritious foods that are safe and affordable. Food safety drives the ultimate availability and nutritional values such that without safe food, nutrition insecurity will persist for consumers in Africa. Socio-economic benefits such as improvement in regions gross national products, increased foreign reserve and employment opportunities are imminent when there is food security and safety. However, the challenges of food security in Africa will persist until the issues of unsafe foods are brought under control and

adequate innovation and strategies are deployed to boost food production.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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