Agriculture and the State of Food Insecurity in Western Africa

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Selected Paper prepared for presentation at the Southern Agricultural Economics Association 48th Annual Meeting, San Antonio, Texas, February 6-9, 2016

Abstract: The world demand for food is growing rapidly due to population increase. Agriculture is expected to play a leading role of feeding a global population that will number 9.6 billion in 2050, while providing income, employment and environmental services. The study assesses agriculture and the state of food insecurity in Western Africa. In the light of slow progress in food security, it is suggested that investments in the agricultural sector that will increase food availability and strengthen the food production system in West Africa should be given immediate priority especially the innovation of family/smallholder farming.

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Abstract

The world demand for food is growing rapidly due to population increase. Agriculture is expected to play a leading role of feeding a global population that will number 9.6 billion in 2050, while providing income, employment and environmental services. The study assesses agriculture and the state of food insecurity in Western Africa. Results revealed that West Africa has made tremendous strides in reducing the proportion of hungry people by 60% thus achieving the Millennium Development Goal (MDG) 1c target compare to her counterparts in the Eastern and Central Africa where progress is slow. Among member countries in the region, Nigeria, Niger, Togo, Benin, Gambia and Mauritania met the MDG 1c target of halving the proportion of hungry people or bringing it under 5% by 2015 whereas Ghana and Mali achieved both MDG 1c and World Food Summit (WFS) targets. However, MDG 1c for Burkina Faso, Guinea, Guinea-Bissau, Cape Verde and Sierra Leone are in a slow progress while Senegal, Liberia, and Côte d'Ivoire are deteriorating. It is therefore, recommended that investments in the agricultural sector that will increase food availability and strengthen the food production system in West Africa should be given immediate attention especially the innovation of family/smallholder farms.

Keywords: Food insecurity, Millennium Development Goal (MDG) 1c, Western Africa

Introduction

Western Africa, also known as West Africa is the westernmost sub- region of the African continent. It shares boundary with the Atlantic Ocean in the South and West and Sahara Desert in the North. The region consist of 16 countries namely: Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, and Togo (Figure 1). According to Population Reference Bureau (PRB) 2014, the population of the entire region is approximately 339 million and has a landmark of about 5 million square kilometers with Nigeria constituting a majority (52%) of the population. A greater percentage (70%) of the entire population of West Africa live in the moist sub-humid and humid zones of the region (FAO and World Bank, 2001). It has been projected that the

entire region population will exceed 507 million by 2030, and 784 million by 2050 (PRB, 2014). The rate of population growth in the region is on the ascendency from year to year (Figure 2 and 3) and it has been predicted that this astronomical rate of growth coupled with low increases in productivity could further tighten resources and increase food insecurity in the region (FAO, 2015; Feed the Future, 2015).

Agriculture (growing of crops, livestock production, fishing, hunting and gathering), trade and craftwork are common work carried out by people in the region (Zoundi, 2003). Several relieve and adjustment programs have been executed in many countries in the region to ensure macroeconomics stability however, farmers who play key role in the region's economy are not able to access many agricultural inputs such as improved seed and agro-chemicals, and faces problems of lower and more uncertain prices of produce (FAO and World Bank, 2001). Despite favorable natural resources, poverty is high among people in member countries in West Africa especially those dwelling in the rural communities. The northern regions of coastal and the landlocked Sahelian countries in the region are relatively food insecure and impoverished. The overall agricultural growth potential and the poverty reduction are considered fairly low, due to very small farm size, shortage of appropriate technologies, poor infrastructure and markets and few opportunities for off-farm activities (FAO, 2014).

All the countries except Mauritania are members of the Economic Community of West African States (ECOWAS) which was founded in 1975. The main objective of ECOWAS at its formation was to achieve economic integration and shared development so as to form a unified economic zone in the region. The scope of ECOWAS was later expanded to include socio-political interactions and mutual development in related spheres (ECOWAS, 1975). One would expect the formation of this organization to safeguard the region's interest in economic

development and socio-political stability as indicated in its objective. Surprisingly, member countries have experienced political unrest in one way or the other which has affected regional stability and agricultural development greatly. For instance, Liberia, Sierra Lone, Guinea-Bissau, and Cote d'Ivoire have suffered from political instability that affected their economy and food security (Committee on World Food Security, 2015; Feed the Future, 2015).

Objective

The primary objective of the study is to assess agriculture and the state of food insecurity in West Africa and to compare the region's performance with other regions in Sub-Saharan Africa towards meeting the Millennium Development Goal (MDG) 1c target of halving the proportion of hungry people or bringing it under 5% by 2015.

Food Insecurity in West Africa

The world demand for food is growing rapidly due to population increase and farmers are expected to produce significantly large amounts of food to meet this pressing demand. Agriculture is expected to play a leading role to arrest the situation and feed a global population that will number 9.6 billion in 2050, while providing income, employment and environmental services (FAO, 2014). Food insecurity has become a global challenge particularly in Sub-Saharan Africa where the rate of population growth far exceed the quantity and quality of food needed to feed the populace. The current available estimates indicate that about 795 million people in the world – just over one in nine – were undernourished in 2014–16 whereas the projection in Africa alone was 233 million people (FAO, IFAD and WFP, 2015). The Millennium Development Goal (MDG) 1c hunger target of halving, by 2015 the proportion of undernourished people in the developing world assessed by FAO, 2014 revealed that

considerable efforts are still needed in the developing world in its journey to eradicate hunger and make it a thing of the past.

In West Africa, approximately 34 million people were projected to be undernourished in 2014-16 (FAO, 2015). Although, the region is making positive strides to recue hunger within the shortest possible time, the situation is alarming in some member countries. Feed the Future, 2015 reported that Liberia depends greatly on importation of food to support domestic consumption for staples, vegetables, pulses, chicken, meat and condiments. Food insecurity is widespread and children are especially vulnerable, with nearly 36% of children below 5 years suffering from stunting and 15% underweight. A 3-year average data on undernourishment from individual countries in West Africa (Table1) revealed that, undernourishment is high in Nigeria (about 10 million people on average) followed by Burkina Faso (3.5 million people on average) however, cape Verde has a remarkable record (< 0.1 million people on average). In general, 37% of the children in West Africa under 5 years suffer from stunting whereas 28.3% are underweight (FAO,2015; Feed the Future, 2015; PRB, 2014).

The rate of infant mortality continues to be a problem in West Africa though measures are underway to curb the situation. The Population Reference Bureau records 2014 shows that the rate of infant mortality in the region as of 2013 was (66/1,000) live birth. Abdulai et al., 2013 also reported that Sierra Leone has the highest (262/1,000) rate of infant mortality while Cape Verde has the lowest (32/1,000) under 5 mortality in the region. The Central Intelligence Agency (CIA) 2014 estimate also revealed that Mali has (104/1,000) live birth infant mortality. Life expectancy of the people in the region as of 2013 was 55years for both sexes with Cape Verde having the most favorable life expectancy at birth (71 years), while Guinea-Bissau, Nigeria, and Sierra Leone show an average life expectancy of 47years and the rest of the

countries fall within 50 and 60 years (PRB, 2014; Abdulai et al., 2013). Rural urban drift is also on the rise in West Africa which is leading to increase in numbers of urban poor. The combined effect of population growth and low increases in productivity has been predicted to further tighten resources and increase food insecurity in the region (Feed the Future, 2015; FAO, 2014).

World Food Summit and the Millennium Declaration.

The world food summit (WFS) set the target of eradicating hunger in all countries in 1996, with the immediate view of alleviating the number of undernourished people to half their present level no later than 2015. In the same vain, in 2000 the Millennium Declaration (MD) also promoted the target to reduce the proportion of people who suffer from hunger between 1990 and 2015 (FAO, 2015). Food and Agriculture Organization (FAO) received the mandate of monitoring progress towards the objectives set by the WFS and the MDGs. The Millennium Development Goals (MDGs) which range from halving extreme poverty to stopping the spread of HIV/AIDS as well as providing universal primary education, all by the target date of 2015 was assessed recently. The goal 1 of the MDGs which focuses on eradication of extreme poverty and hunger revealed that the number of people living in extreme poverty has declined from 1.9 billion in 1990 to 836 million in 2015. The proportion of undernourished people in developing regions has also decreased by almost half since 1990, from 23.3% in 1990–1992 to 12.9% in 2014–2016 (MDG report, 2015).

The prevalence of undernourishment in West Africa has seen a reduction greatly. "Undernourishment prevalence expresses the probability that a randomly selected individual from a population consumes an amount of calories that is insufficient to cover his/her energy requirement for an active and healthy life" (FAO, 2015). The indicator is computed by comparing a probability distribution of habitual daily dietary energy consumption with a

threshold level called the minimum dietary energy Requirement. A 3-year average prevalence trend of undernourishment (1990-92 to 2014-16) shows a decline from 24.2% to 9.5% in West Africa (Figure 4).

Recently, FAO reported that West Africa has made tremendous strides by reducing the proportion of hungry people by 60% thus achieving the MDG target of halving the proportion of people suffering from hunger compare to her counterparts in the Eastern Africa-made some progress towards MDG 1 and Central Africa-lagging behind in both MDG 1 and WFS targets (FAO, 2015). Among the individual countries in the region Nigeria, Niger, Togo, Benin, Gambia and Mauritania met the MDG 1c target whereas Ghana and Mali achieved both MDG 1c and the World Food Summit (WFS) targets. However, the MDG 1c target for Burkina Faso, Guinea, Guinea-Bissau, Cape Verde and Sierra Leone are in a slow progress whereas Senegal, Liberia, and Côte d'Ivoire are deteriorating (FAO, 2015).

A three-year average comparison of Western Africa to Central, Eastern, and Southern Africa in Sub-Saharan Africa with respect to number of people undernourished and the prevalence rate revealed that Central Africa will have the highest prevalence rate of 41.3% undernourishment with 58.9 million people undernourished between 2014-16 estimate, followed by Eastern Africa, 31.5% rate with 124.2 million people undernourished whereas Western Africa will have 9.6% with 33.7 million people undernourished. Southern Africa had the least number of 3.2 million people undernourished with 5.2% prevalence rate within the projected year of 2014-16 (Figure 5). It can be seen that Western Africa is doing relatively well in its effort to surmount undernourishment and its prevalence among the people in the region. Eastern Africa remains the sub region with the biggest hunger problem in absolute terms, being home to 124 million undernourished people. The most successful sub region as far as reducing hunger in

Sub Saharan Africa is concern is Southern and Western Africa. In Western Africa the number of undernourished people has decreased to 24.5% since 1990-02, and the prevalence rate is projected to be less than 10 % in 2014–16 (FAO, 2015).

Regional Gross Domestic Product and Agricultural Production

There has been a significant increase in both Gross Domestic Product (GDP) and per capita GDP of West Africa however, the rate of growth remain relatively low across member countries. Abdulai et al., 2013 reported that Côte d'Ivoire, Guinea-Bissau, Liberia, Niger, and Togo, had a significant decrease in their per capita GDP between 1988 and 2008 and this was attributed to civil war and political unrest the countries experienced. The agriculture sector has been the main mainstay of the economy of West Africa providing 30–50% of GDP in most countries, the major source of income and livelihoods for 70–80% of the population, food supplies and revenue from export of cash crops (Camilla and Guèye, 2003). The GDP of the entire region grows at 5.9% annually for the past 10 years with agriculture sector accounting for 35% of the overall Gross Domestic Product. Half (50%) of the region's population lives less than $1.25 per day (FAO, 2015; Feed the Future, 2015).

In Ghana, the annual GDP growth as at 2012 was 8%, agricultural growth has been the major driver of poverty reduction, especially in the southern part of the country where agriculture is dominated by smallholder farmers (World Bank, 2012). A careful study of the trend of per capita income in West Africa (from 1990 to 2013) shows that there has been a progressive growth (Figure 6). Available per capita GDP as of 2013 stands at $ 3,855.10 in purchasing power equivalence in the region. With individual member countries, Cape Verde, Nigeria and Ghana have the greatest per capita GDP of $ 6,210.00, $ 5,422.00, $3,864.00 respectively while Liberia has the least per capita GDP amount of $849.00 (FAOSTAT, 2015).

Climate, land Use, and Agriculture Production in West Africa

Climate is defined as the average weather usually taken over a 30-year time period for a particular region and time period (Osgood, 2008). Le Treut et al., 2007 described climate in terms of the mean and variability of temperature, precipitation, and wind over a period of time, ranging from months to years (the classical period is 30 years). Climate change and global warming are considered major threats to agriculture and food production and has become a global concern. The rate of increase in climate change poses new problems to farmers as they have no option than to respond to conditions that are outside their historical ranges, including the increasing incidence of extreme weather conditions (Liz et al., 2014). This situation together with population growth, threatens food security everywhere therefore, producers are forced to adapt to shifting production conditions in order to meet their target through various adaptation strategies (FAO, 2008).

West Africa cannot be left out on the impact of climate change to agriculture. The entire region is highly diverse in terms of agro-climatic conditions as well as the distribution of population. Experts predict that across the region, dry areas will continue to be drier whereas wet areas will also be wetter, a condition which has the potential to fuel the proliferation of pests and diseases that are detrimental to staple crops and will further worsen food insecurity situation in the region (IPCC, 2007; FAO, 2008; IISD, 2008). Land ownership and the use of land for agricultural production is another problem that farmers especially smallholder/family famers in developing countries face (USAID, 2013). In West Africa smallholder/family farmers claim rights over land through customary procedures and a majority do not hold formal paper title. The practice usually results in land litigation, confusion and fight among families and community members when the one who gave the land out pass away (Camilla and Guèye, 2003). Brautigam

1992 reported that the traditional communal systems of land tenure in West Africa are an obstacle to agricultural development. The reason being that people without secure land title will not invest in the development of the land, since they cannot be assured access to it in future or use it as collateral for agricultural credit. The worse thing is that traditional land rights without formal documents usually lead to land seizure by elites. However, studies have shown that famers can participate effectively in the agricultural economy if they have secure ownership and access to land and resources (USAID, 2013). The good news is that USAID is working assiduously to resolve agricultural land problems in the sub region. For the past 50 years, USAID has worked on land reforms, land certification and titling, and conflict resolution programs that have provided security and opportunity for rural families and communities around the world (USAID, 2013).

The potential of agricultural land in West Africa to support food production system is very high. The region has about 236 million hectares of cultivable land however, only 55 million hectares are cultivated annually (Elbehri et. al., 2013). Even though the population of the region is on the surge, there are productive lands to produce enough food in the region since uncultivated land accounts for 71% of the cultivable potential. Surprisingly, farm sizes are generally small and crop production are for household consumption and little for sale, except for cash crops such as cotton and cocoa production, which are subsidized to varying degrees in Benin, Burkina Faso and Ghana (Callo-Concha, et. al.,2013). Igue et al., 2000 observed that in western part of Benin, 50% of farms are smaller than 1.25 ha, and in Ghana 70% of farms in Upper East Region varies from 0.5 to 2 ha; the average size of a compound farm is 1.3 ha for a family of 8 persons.

Family farms have been identified to occupy large tracts of the world's farmland and contributes substantially to the world's food supply (FAO, 2014). However, certain constraints influence the capacity of family farms to champion food security, especially smallholder farms to respond to higher prices and increase their production. Prominent among these constraints are: household access to assets, including natural resources, labor and capital; the degree to which the family farm is connected to markets; and the functionality of those markets, especially their integration with international markets and high initial production cost and long pay-off periods when making improvements (FAO, 2013e,). This calls for urgent attention to improve family/ smallholder farms. Ejeta (2015) also found that 80% of the food supply of Asia and Sub-Saharan Africa are obtained from small scale farmers however, these farmers have little access to technology and market but they are entrepreneurial in mind-set. Additionally, IFPRI's reported that the backbone of agricultural production in developing countries is smallholder family farming and acknowledge that four-fifths of the developing world's food comes from the product of small-sized farms and also serve as the dwelling place to the majority of people living in absolute poverty and undernourished (IFPRI, 2015).

Although, West Africa is endowed with abundant land and water resources, access to water remains a problem and agriculture remains predominantly rain fed. This has led the region's agriculture become vulnerable especially to weather variability, soil fertility degradation, and infestations of pests and diseases. The condition become even worse when there is extreme weather changes (Camilla and Guèye, 2003; FAO, 2009; Feed the Future, 2015). Current report indicates that agricultural productivity in Liberia is very low with a high rate of post-harvest losses, reaching up to 45% in some areas and value chains are severely underdeveloped (Feed the Future, 2015). Irrigated agriculture is rarely done in West Africa as

only 4 % of the entire region's arable land is used for irrigated agriculture (Elbehri et. al., 2013). A 3-year average irrigation pattern among member countries in the region revealed that Mauritania, Guinea-Bissau and Cape Verde use 11%, 9% and 7% of their arable land for irrigated agriculture. The rest of the countries in the region use 5% or less of their arable land for irrigated agriculture (Table 2). To increase crop production and achieve food security, agriculture must move from the traditional method of rain fed to a more sustainable and reliable method considering unpredictable climate change. Irrigated agriculture, efficient irrigation systems and technologies have currently assumed greater importance in increasing food production (FAO, 2001).

Family labor plays a crucial role in Agricultural production in West Africa. In Ghana for instance, cocoa production employs approximately 800,000 farm families spread over six regions in cocoa dominated areas in the country (Bosompem and Mensah, 2012). Camilla and Guèye, 2003 found that cotton is grown by more than 200,000 farm households averaging 15 people, cultivating 10 hectares. Women dominate in the production, processing and marketing of agricultural produce in West Africa, more than 64% of women in the region are engaged in the agricultural sector and serve as the guardians of the region's food security (ILO, 2009). It is estimated that women produce 80% of food resources in the region however, they are discriminated against in the labor market, their access to land is limited and they are often ignored in rural development projects which tend to target male-dominated activities (FAO, 2001; ILO, 2009).

Cocoa production is one of the major cash crops produce in large quantities in West Africa and has a remarkable record to the contribution of the world's cocoa production. In general, the region collectively supplies two thirds of the world's cocoa beans with Ivory Coast

and Ghana producing 70% of the annual global production (Hardman and Co, 2014; World Cocoa Foundation /African Cocoa Initiative, 2012). This is highly commendable, however, little attention has been given to staple food production in the region compare to traditional cash crops, and this has affected the production of staple food. Kurz and Thiam, 2010 noticed that Ministries of Agriculture in West Africa often emphasize food production for export or commercial use, more than focusing on the nourishment of the vulnerable groups of the population. Salifou, 2008 also asserted that one major constraint that threatens food security in the region's agriculture is that, policy tools are primarily geared towards commercially profitable cash crops rather than the support needed to achieve the objectives of food security, rural employment and integration into the regional market. Inputs and modern technologies such as fertilizer, machinery, and irrigation technology are expensive, therefore producers' find it difficult to use in production. Meanwhile, studies have shown that the development and spread of new technologies and farm practices that maximize yield potential for a particular area depends greatly on that area's ability to make needed investments, the willingness of farmers to access and improve their skills and adopt the provided technologies (Rosen and Shapouri, 2012).

Dominant Staple Foods Consumed in West Africa

West Africa covers a wide range of agro-ecological zones, from arid to semi-arid, sub-humid and humid climates. The climatic condition and vegetation determine the suitable crop to be grown and consumed. Consumption patterns vary according to countries, regions or even localities within the same country that feature diverse climates. The most important food crops grown and consumed in the region are cereals (sorghum, millet, maize, and rice), roots and tubers (cassava, sweet potatoes, and yams) and legumes (cowpeas and groundnuts) as well as

plantain and banana. Elbehri et al., 2013 categorized the countries in the region into two groups' base on their consumption pattern of some prominent basic staple foods.

Countries that depend predominantly on cereals:

The countries in this category include: Burkina Faso, Gambia, Guinea Bissau, Mali, Mauritania, Niger, Senegal and Sierra Leone. This group further divides into countries relying mostly on sorghum and millet (Burkina Faso, Gambia, Mali and Niger), countries eating mostly wheat (Mauritania), and rice-eating countries (Guinea-Bissau, Senegal and Sierra Leone).

Countries that rely on roots/tubers and cereals as their basic food:

This includes: Benin, Côte d'Ivoire, Ghana, Guinea, Liberia, Nigeria and Togo. In all these countries, cassava consumption dominates, followed by yam (except for Côte d'Ivoire where yam is preferred to cassava). Banana plantain is also consumed in significant quantities in Côte d'Ivoire, Ghana and Guinea. Rice and maize consumption are also predominant in these countries, reaching at least 85 kg/person/year (Elbehri et al., 2013).

Over the years there has been a significant improvement in food production in West Africa. The production pattern for major staple food in the region has seen some face lift especially cassava and yams. There has been a great increase in the production of cassava from 2000 to 2013 followed by yam and maize (Figure 7). Interesting, paddy rice which is been consumed greatly (almost every country) in the region has not seen a greater output compare to cassava and yam (Figure 7). The humid regions in the south are dominated by cereals (maize, sorghum and millet), legumes (groundnut and cowpea), and root crops (yam and cassava).

An assessment of member countries performance by Economic Research Service/USDA, 2014 with respect to grain and root production in (Table 3) revealed that Sierra Leone had the greatest annual growth in grain production (8.2%) followed by Liberia (6.8%). The rest of the

countries annual growth in grain production ranges from 2.0% to 6.0% with Cape Verde having the least value of -5.3%. For root crop production Mali had the highest annual growth of 13.9% between 1990-12 followed by Senegal (10%) with the rest of the countries having between 1.2% to 5.7% annual growth and the least growth was experienced by Gambia(-1.2%).

Furthermore, there is an increase in food deficits in countries that were traditionally self-sufficient in the 1960s and now struggling to maintain their status of self-sufficiency in food production (Zuma, 2010). Current available report on cereal import dependency ratio from FAO shows that there are high rates of cereal importation in the region. Five countries in West Africa that import cereals on large quantities to support their food deficit are Cape Verde, Liberia, Mauritania, Gambia and Côte d'Ivoire (Figure 8). Domestic food price volatility in West Africa also threatens food security in the region. Studies have shown that too much price volatility and price spikes affect economic and food security policies especially in income, markets and nutrition in a country or a region (Isolina and Saura, 2011). Usually, fluctuations in prices become worrisome when they are large and cannot be anticipated, This go a long way to create a situation of uncertainty which accelerate risks for producers, traders, consumers and governments. Domestic food price volatility, to some extent is an inherent characteristic of agricultural commodity markets, especially when there is a mismatch between timing of supply (which is seasonal) and timing of demand (which is much less seasonal). For instance, when the demand for a commodity far exceed the supply traders/producers take advantage and increase prices at the detriment of consumers. In the same manner when supply exceeds demand, producers are offered any price for their produce which goes against them. This is often seen in developing countries where there is inadequate storage facilities to store produce when they are in abundance to wait for a reasonable price to offset cost of production.

The trend of domestic food price volatility index (2000-2014) in West Africa and some member countries in the region in Figure 9 and 10 revealed that prices of agricultural commodities are not stable. There has been several fluctuations in food prices in the region. For example Niger experienced a huge rise in domestic food price between 2004 and 2007. In the same vain Burkina Faso also witnessed the greatest increase in domestic food price in 2008 followed by Nigeria and Ghana during the period of 2006 and 2007 as well as Côte d'Ivoire in 2010 and 2012. Although Ghana looks promising as far as the MDG1c and WFS target are concern, the current available information on volatility of domestic food price is not encouraging. Within the five West African countries selected in Figure 10, Ghana's domestic food price is on the increase above the rest of the countries in 2014. Such a limitation and others are sometimes not reported by governments in developing countries so as to look good in the face of international organizations at the expense of the people in the country especially the poor who cannot purchase quality food due to increase in food prices domestically.

The Concept of Food Security

The campaign for food security has become a global concern since the first World Food Conference of 1974 (Anjani, et al., 2012). Several organizations, institutions and researchers have different definitions for food security however, the essence or central idea in all the definitions are similar. According to Baldwin 2006, food security and insecurity are terms used to describe whether or not people have access to sufficient quantity and quality of food. The Economic Research Service of USDA, 2006 explained food security to mean a situation where: "People at all times have physical and economic access to adequate amounts of nutritious, safe, and culturally appropriate foods, which are produced in an environmentally sustainable and socially just manner, and that people are able to make informed decisions about their choices

(that is, without resorting to emergency food supplies, scavenging, stealing, or other coping strategies)". Similarly, The World Food Summit in 1996 also adopted the definition of food security as: "Food security exists when all people at all times have physical or economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (FAO, 1996).

United States Department of Agriculture reported that the food security status of household lies somewhere along a continuum extending from high food security to very low food security and that the continuum is divided into four grouped as follows: *High food security*: Households have no problems, or anxiety about, consistently accessing adequate food, *Marginal food security*: Households have problems at times, or anxiety about, accessing adequate food, but the quality, variety, and quantity of their food intake are not substantially reduced, *Low food security*: Households reduced the quality, variety, and desirability of their diets, but the quantity of food intake and normal eating patterns are not substantially disrupted, *Very low food security*: At times during the year, eating patterns of one or more household members are disrupted and food intake reduced because the household lacked money and other resources for food (USDA, 2006). Food insecurity is the direct opposite of food security. The term food insecurity refers to limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways (USDA, 2006). Food insecurity is also viewed as a situation where people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life. It may be caused by the unavailability of food, insufficient purchasing power, inappropriate distribution or inadequate use of food at the household level (FAO, IFAD and WFP, 2014).

Food and Agriculture Organization measured food insecurity to capture the inability to afford four elements/indicators of food security. These are food availability, food accessibility, food utilization and food system stability. Availability focuses on food production whereas accessibility explains the ability of people to obtain food, either through production, purchase or transfers. Food utilization looks at the nutritional value of food, the interaction with physiological condition and food safety. Food system stability talks about stability of supply and access, as well as the ability to respond to food emergencies (FAO, 2002). Globally, Sub-Saharan Africa (SSA) remains the most food-insecure region as 29% of its population was estimated to be food insecure in 2014 and will continue to deteriorate to 30.7% in 2024 if urgent measures are not taking to rescue the situation (Economic Research Service/USDA, 2014; Fuglie et al., 2014).

Lopriore and Muehlhoff 2007, found that West Africa had experienced very little progress in reducing food insecurity and child malnutrition in the past 20 years and concluded that approximately one third of children under 5 years of age are stunted while 5-15% are wasted. Despite numerous challenges, there has been a period of sustained growth in agriculture in West Africa that exceeds many of Asian countries with a combination of increased labor productivity, higher yields and expansion of land area under cultivation (Zuma, 2010). FAO, IFAD and WFP, 2014 reported that there has been a considerably improvement in food availability over the past two decades, with more food available than ever before. This increase is reflected in the improved adequacy of dietary energy and average supplies of protein. In the same vain, the depth of food deficit in the region has also witness a decrease in pattern, moving from 101% in 2000-02 to 63% estimated 2013-15 (Figure 11). However, this performance is nowhere near North Africa where there is tremendous levels of access and availability of food,

reflecting rises in income levels and extensive policy interventions aimed at making basic food items available at very low prices (FAOSTAT, 2015).

The Role of International Development Agencies to Mitigate Food Insecurity in West Africa

The four elements of food security (availability, accessibility, stability, and utilization) has become global priority in overcoming food insecurity. In order to ensure sustained food security and hunger free society especially in developing countries, stringent measures has to be put in place as far as production and consumption of local foods are concern, since many people especially those in the developing world remains glued to their indigenous food for survival (FAO, 2008; Bruinsma, 2009; FAO, 2015). Agriculture production has been identified as the path to champion the course of mitigating global hunger. Studies have shown that countries with large food insecure populations are often also those whose agricultural systems are highly susceptible to climate influences, particularly in Sub Saharan Africa, South and Southeast Asia (FAO, 2014; Gregory et. al., 2005).

Several organizations, agencies and anti-hunger institutions (FAO, USDA, World Bank, CGIAR, Feed the future, USAID, IFPRI and to mention few) have taking upon themselves to let policy makers realize the need to give attention to agriculture production especially in the developing world. For instance, FAO (2009) acknowledged the World Development Report 2008 on the importance of sustaining agriculture to boost the economy of developing countries particularly rural communities where agriculture provide livelihood for majority of the populace. Building a sustainable human capacity in agriculture is one step to strengthen agricultural development. In the light of this, USAID has championed the course of providing scholarship to qualified students from developing countries for long term graduate studies in the United States. These students are expected to return to their respective countries and put into practice the skills

and expertise they have acquired with the local and smallholders farmers, colleagues and entrepreneurs as well as the new generation of students (USAID,2013). This will help to promote better human capacity building in agriculture through education and participant training in most rural communities in the globe where agriculture has been left in the hands of the rural poor.

In West Africa, a lot of Agricultural relieve programs has been carried out to sustain agriculture and rural development in order to alleviate hunger. Through investment in Community Based Natural Resource Management (CBNRM) a lot of communities in West Africa have benefited tremendously in recent times. In Niger for instance, USAID has helped in the Clarification of land tenure reforms and water conservation techniques as well as natural regeneration of trees and shrubs in farm fields (USAID, 2013). Through its leading role in sustaining agriculture in the developing world, USDA, supported a research to analyze the political economy of rice policy in West Africa. The results of the project brought to light distortions caused by government intervention in rice market and trade, this led to reformation of the agriculture sector in five West African countries. To add to this, the training of local policy analyst in the region which was funded by USDA and World Bank spread the understanding and adoption of value chains long before the term "value chain" came into being for use in development circles (USDA and World Bank, 2013).

Feed the Future, U.S. Government Global Hunger and Food Security Initiative has taking upon itself to fight hunger and ensure food security in Sub-Saharan Africa. From production to marketing, Feed the Future is helping to increase the competitiveness of rice, maize and soybean value chains in northern Ghana. The organization is increasing farmers' access to seeds and fertilizers, building and rehabilitating irrigation systems, improving crop research and farming practices, and modernizing storage and distribution methods. Feed the Future activities also

incorporate information on climate vulnerabilities and other information to support sustainable food security (Feed the Future, 2015). As one of the success stories for this intervention from feed the future, 34,000 farmers in Ghana benefitted various agricultural supports last year, collectively increasing the value of their agricultural sales more than 260% and harvests more than 280%. Currently, efforts are under way to improve infrastructure for postharvest operations (processing and storage) and access to finance in Senegal. There is also revitalization of up to five seed certification labs and seed conditioning facilities in the same country (Feed the Future, 2015). In the same manner, USAID is supporting the government of Senegal to reform agricultural policy and investment plan as well as food security and nutrition commitments.

Through the initiative of FAO, the Government of Ghana has partnered with the private sector and civil society in implementing and reviewing policies and programs to develop the agricultural sector. Public private partnerships (PPPs) have been targeted for extension services, research and innovation development, and for agricultural mechanization. For instance, PPP arrangements have been initiated to rehabilitate the country's rubber plantations, to increase production of palm oil and cocoa, and for developing new supply chains for sorghum. In the case of rubber, over 6,000 farmers are said to have gained employment through the out-grower scheme (FAO, 2015). In 2010, World Bank launched the second phase of the West Africa Agricultural Productivity Program (WAAPP-1B) with the objective of expanding the support to food security in the sub-region by generating new knowledge and technologies (CFS, 2015). All these are been done for agriculture sustainability and improvement of livelihood of the people particularly the rural poor in which agriculture have been let at their mercy.

Data and Methods

The study is purely expository research. Analysis were based on secondary data obtained from various International Organizations, Anti-Hunger Institutions and Agricultural Agencies (FAO, FAOSTAT, USDA, WFP, IFAD, USAID, Feed the Future, PRB, etc) publications, economic reviews, and agricultural reports. West Africa as a region in the African continent and part of Sub-Saharan Africa was assessed in general as far as regional profile and food insecurity matters are concern. Data obtained from the aforementioned agencies and organizations were narrowed to some of the pressing issues in member countries in the region. Emphasis were placed on the region's population, climate and land use for agricultural production, GDP and undernourishment and its prevalence, regional position as far as MDG 1c and WFS targets are concern, the role and success stories of international organizations to mitigate food insecurity in the region. Data gathered from the various sources were analyze d and presented in the form of charts and tables to give a clear picture of the situation of food insecurity in the study area.

Results and Discussion

The study revealed that West Africa has made tremendous strides in reducing the proportion of hungry people by 60% thus achieving the MDG target of halving the proportion of people suffering from hunger compare to her counterparts in the Eastern, (made some progress towards MDG) and Central Africa (lagging behind in both MDG and WFS targets). Among individual countries in the region Nigeria, Niger, Togo, Benin, Gambia and Mauritania met the Millennium Development Goal (MDG) 1c target of halving the proportion of hungry people or bringing it under 5% by 2015 whereas, Ghana and Mali achieved both MDG 1c and World Food Summit (WFS) targets. However, the target for Senegal, Liberia, and Côte d'Ivoire are deteriorating while, Burkina Faso, Guinea, Guinea-Bissau, Cape Verde, and Sierra Leone are on

a slow progress. Liberia was found to depend heavily on foreign imports to support her domestic food need. Approximately, 36% of children under 5 years in the country are suffering from stunting whereas 15% are underweight. Ten million people were also found in Nigeria to face undernourishment problems. It was also found that nearly 34 million people were projected to be undernourished in 2014-16 in West Africa.

The study again revealed that there is improvement in the production of staples to feed the people in West Africa especially in root and tuber crops (cassava and yam), however, the region's performance as far as cereal production is concern was relatively small. There is high cereal import dependency ratio among member countries in the region. Cape Verde, Liberia, Mauritania, Gambia and Côte d'Ivoire import more than 50% cereals to support domestic food needs. Irrigated Agriculture was also rarely done in the region though, there are enough arable land and river bodies to support irrigated crop production. Surprisingly, only 4% of the entire region's crop production was with irrigation. Within the member countries, Mauritania uses 11% of its arable land for irrigated agriculture while the rest of the countries use between 9 to 5% or less of their arable land for irrigation.

One major constraint identified to threaten food security in the region's agriculture was that, policy tools are primarily directed towards commercially profitable cash crops rather than the support needed to achieve food security, rural employment and integration into the regional market. Also family/smallholder farms that produce a greater percentage of the region's food are constraint with capacity to innovate. Problems such as high initial cost of new practices, limited access to inputs, information, markets and technologies affect production greatly in West Africa.

In the face of the aforesaid challenges, International Agencies and Governmental Organization have taken upon themselves to assist the region to achieve food security and make

hunger a thing of the past. For instance, Niger is been assisted by USAID to improved soil and water conservation techniques and the protection of natural regeneration of trees and shrubs in farm fields whereas Ghana is also benefiting from Feed the Future's program of increasing farmers' access to agricultural inputs and rehabilitation of irrigation systems, improve crop research and farming practices, and modernization of storage and distribution methods. In the same way, World Bank has launched the second phase of the West Africa Agricultural Productivity Program (WA APP-1B) with the objective of expanding its support to food security in the sub-region. In Senegal efforts are underway to improve infrastructure for postharvest operations, including processing, storage and access to finance to build seed certification labs. All these interventions are carried out with the aim of fighting hunger and food insecurity in the region and make it a thing of the past.

Conclusions and Recommendation

West Africa has taking a bold step to combat food insecurity. Several research and sustainable agricultural programs are underway in member countries and the region as a whole by international bodies such as USAID, Feed the Future, FAO, WFP, IFAD etc, on the appropriate strategies to mitigate hunger and food insecurity in the region. As indicated earlier, the region achieved the Millennium Development Goal (MDG) 1c target and reduced the proportion of hungry people by 60%. A comparison of West Africa to her counterparts (Eastern and Central Africa) in Sub-Saharan Africa revealed that the region's progress in achieving food security far outweigh them. However, problems still exist in member countries especially in Liberia, Senegal, Côte d'Ivoire, Burkina Faso, Guinea, Guinea-Bissau, Cape Verde and Sierra Leone in their quest to meet the Millennium Development Goal (MDG) 1c target. There is also high dependency ratio on cereal import to support domestic food needs Rain fed agriculture and

the use of traditional methods of food production that are vulnerable to climate change dominate in the region.

It has been found that the potential to improve labor productivity and yields can only be realized if families/smallholder farms are able to innovate especially in developing countries where about 80% of food production rest on their shoulders. Therefore, it is recommended that polices towards agriculture and food security must be geared towards helping family farmers to have access to; land, water, capital, rural financial services (credit, savings, insurance), road, transportation infrastructure, strong rural organizations (voice for services, markets, policy making), sustained government investment and support for research and development.

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Figure 1: Map of West Africa showing 16 member countries.

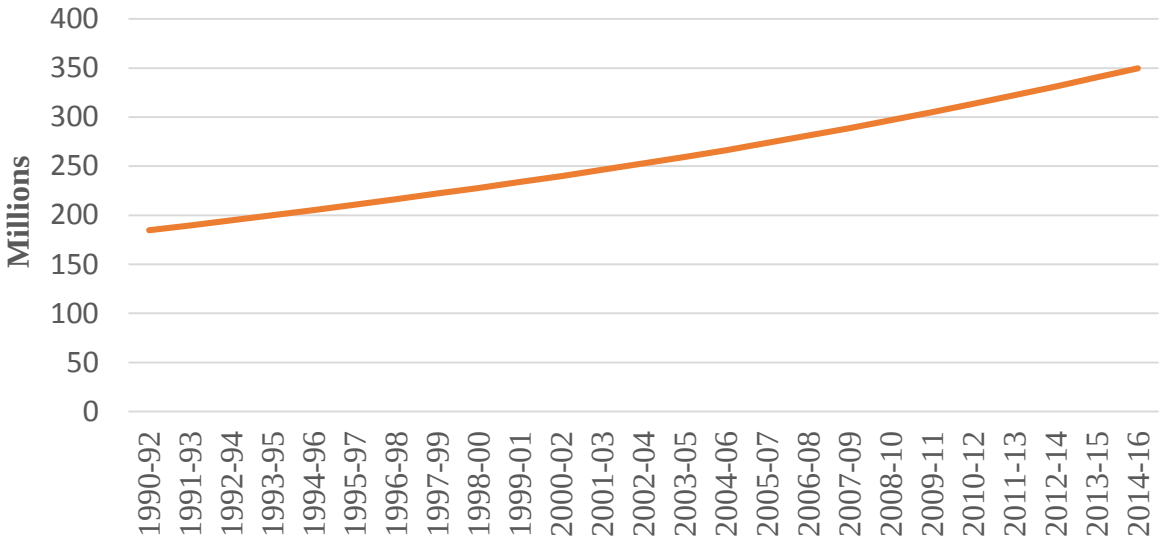

Figure 2. 3-Year Average Population Growth in West Africa. (*Projections).
Source: FAO, 2015

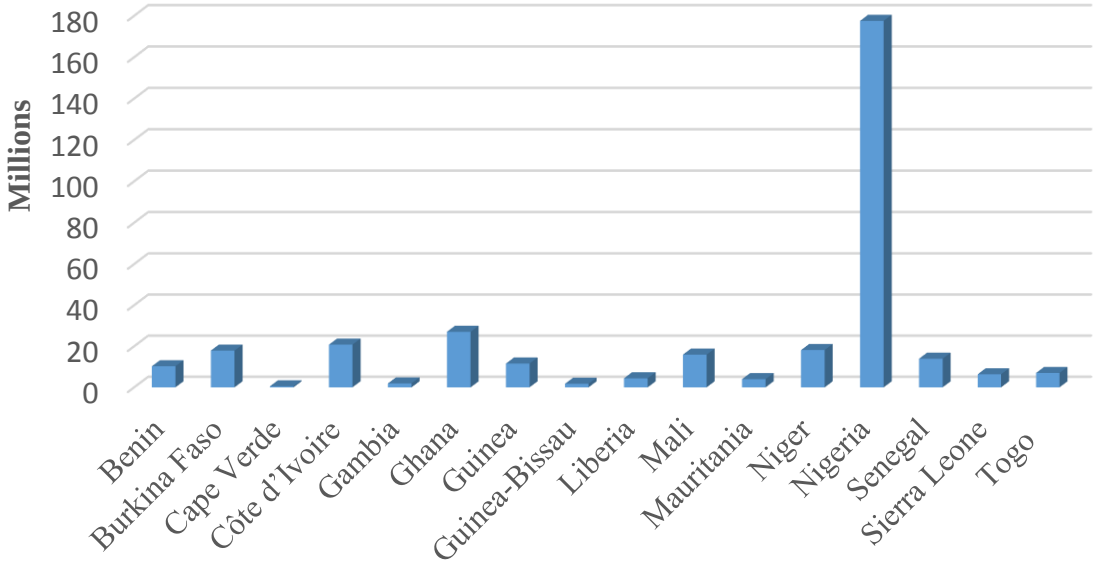

Figure 3. Population of Member Countries in West Africa.
Source: (PRB, 2014).

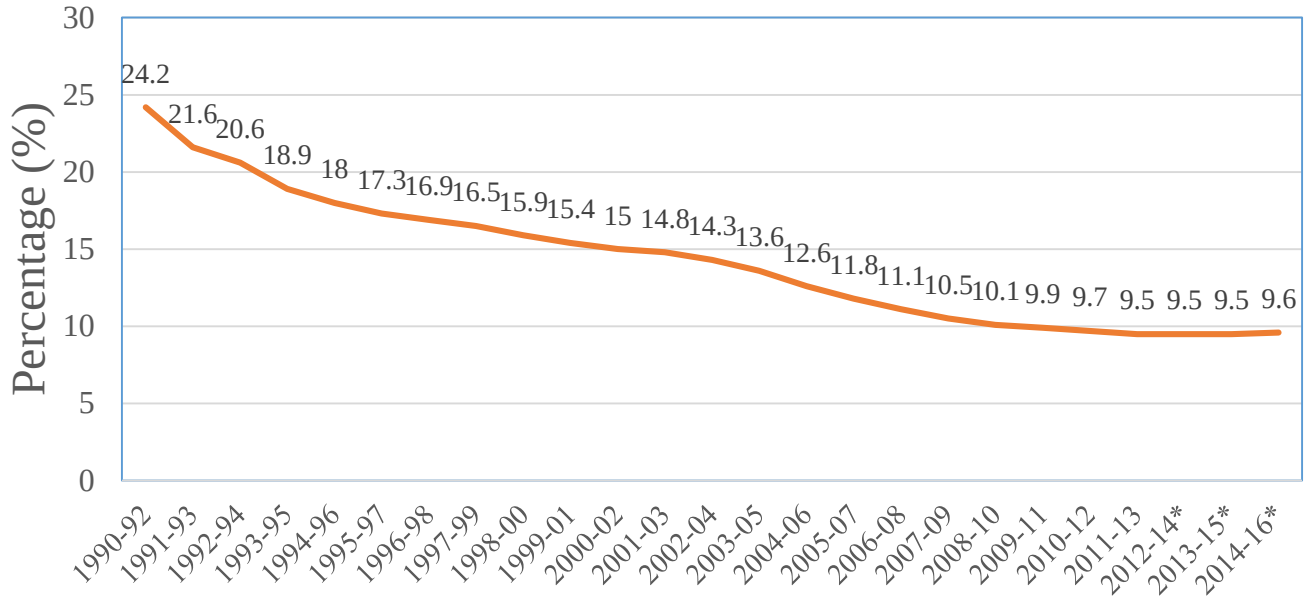

Figure 4. 3-Year Average Prevalence Rate of Undernourishment in West Africa. (*projections).
Source: FAOSTAT, 2015

Table 1: Number of People Undernourished (in million) in the Sixteen Countries in West Africa (3-Year Average, 2000-02 to 2011-13)

Countries/Years	2000-02	2001-03	2002-04	2003-05	2004-06	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12	2011-13
Benin	1.6	1.5	1.4	1.4	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.1
Burkina Faso	3.3	3.4	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Cape Verde	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Côte d'Ivoire	2.7	2.8	2.8	2.7	2.6	2.5	2.5	2.6	2.7	2.8	2.8	2.8
Gambia	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
Ghana	3.1	2.9	2.8	2.6	2.5	2.3	2.1	1.9	1.7	1.6	1.4	-
Guinea,	2.3	2.3	2.3	2.3	2.2	2.2	2.1	2	2	2	2	2
Guinea-Bissau	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Liberia	1.1	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4
Mali	1.3	1.3	1.3	1.3	1.2	1.1	1	0.8	0.7	-	-	-
Mauritania	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3
Niger	2.3	2.3	2.2	2.1	2	2	1.9	1.9	1.8	1.8	1.7	1.8
Nigeria	11.2	11.7	11.5	11	10	9.3	8.9	9	9.3	9.7	10.2	10.6
Senegal	2.9	2.8	2.8	2.7	2.6	2.4	2.2	2	1.8	1.8	1.9	2.3
Sierra Leone	1.7	1.8	1.9	2	2	2	1.9	1.8	1.7	1.7	1.6	1.5
Togo	1.4	1.5	1.5	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.2	1.1

Source: FAOSTAT, 2015.

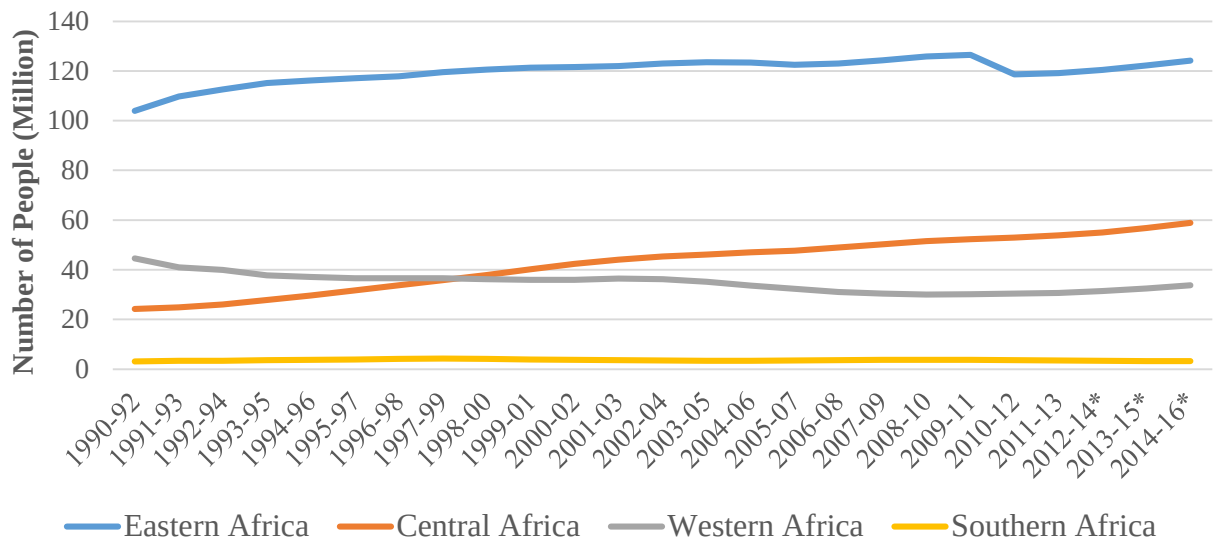

Figure 5. 3-Year Average of Undernourishment of People within Regions in Sub-Saharan Africa.
(*Projections)
Source: FAOSTAT, 2015.

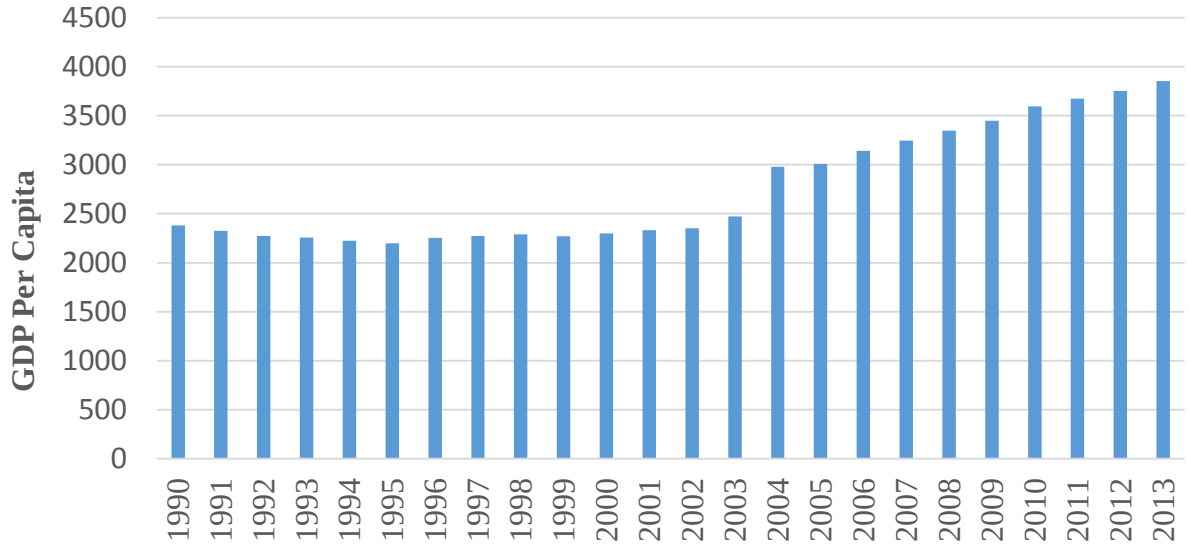

Figure 6. Per Capital GDP of Western Africa in Purchasing Power Equivalent.
Source: FAOSTAT, 2015.

Table 2: Percentage (%) of Arable Land Equipped for Irrigation in the Countries in West Africa (3-Year Average, 2000-02 to 2010-12)

Countries/Years	2000-02	2001-03	2002-04	2003-05	2004-06	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12
Benin	0.5	0.5	0.5	0.6	0.7	0.8	0.8	0.9	0.9	0.9	0.9
Burkina Faso	0.6	0.6	0.6	0.7	0.8	0.8	0.8	0.8	0.8	0.9	0.9
Cape Verde	6.6	6.4	6.7	7.1	7.4	7.4	7.4	7.4	7.4	7.4	7.4
Côte d'Ivoire	2.6	2.6	2.6	2.6	2.6	2.6	2.5	2.5	2.5	2.5	2.5
Gambia	0.7	0.7	0.7	0.6	0.7	0.8	0.8	0.8	0.9	1.1	1.1
Ghana	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7
Guinea,	4.2	4	3.8	3.7	3.5	3.4	3.4	3.4	3.3	3.3	3.2
Guinea-Bissau	8.5	8.8	9	9	8.9	8.9	8.9	8.9	8.7	8.5	8.3
Liberia	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.6	0.6
Mali	5.3	5	5	5	5.4	5.4	5.6	5.6	5.6	5.5	5.5
Mauritania	10.1	10.8	11.2	11.2	11.2	11.2	11.2	11.3	10.9	10.9	10.8
Niger	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6
Nigeria	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9
Senegal	3.7	3.8	3.9	3.9	3.9	3.9	3.7	3.4	3.2	3.3	3.4
Sierra Leone	4.3	3.2	2.5	2.2	2	2	2.1	2.2	2	1.9	1.8
Togo	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

Source: FAOSTAT, 2015.

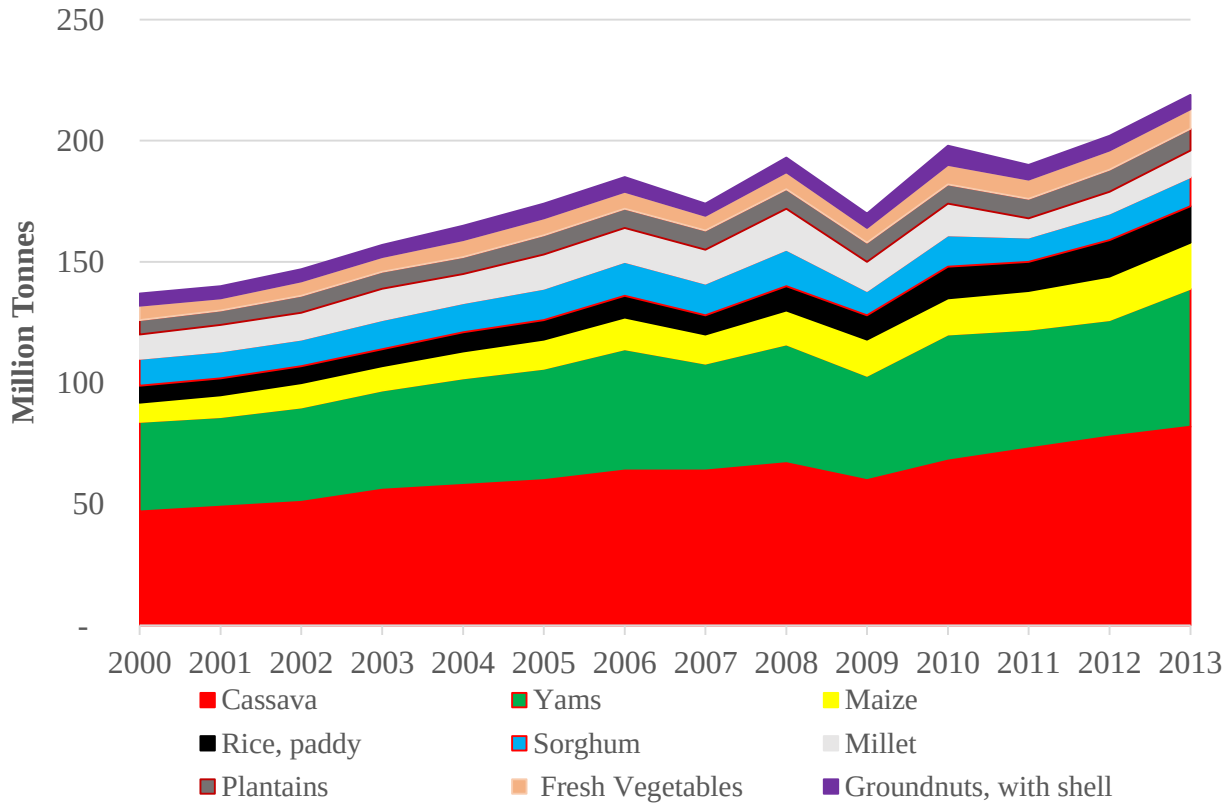

Figure 7. Production trend of major staple food grown in West Africa. Source: FAOSTAT, 2015.

Table 3: Country Indicators on Grain and Root Crop Production

Countries	Annual Grain Production Growth, 1990-2013	Annual Root Production Growth, 1990-2012
	(%)	(%)
Benin	3.6	5.1
Burkina Faso	3.8	5.7
Cape Verde	-5.3	0.9
Côte d'Ivoire	0.8	2.7
Gambia	5.3	-1.2
Ghana	3.4	5.0
Guinea,	6.0	2.7
Guinea-Bissau	1.6	4.5
Liberia	6.8	3.7
Mali	5.4	13.9
Mauritania	3.0	1.2
Niger	4.1	1.6
Nigeria	2.5	4.2
Senegal	2.0	10.3
Sierra Leone	8.2	5.8
Togo	3.9	2.6

Source: FAO, 2015.

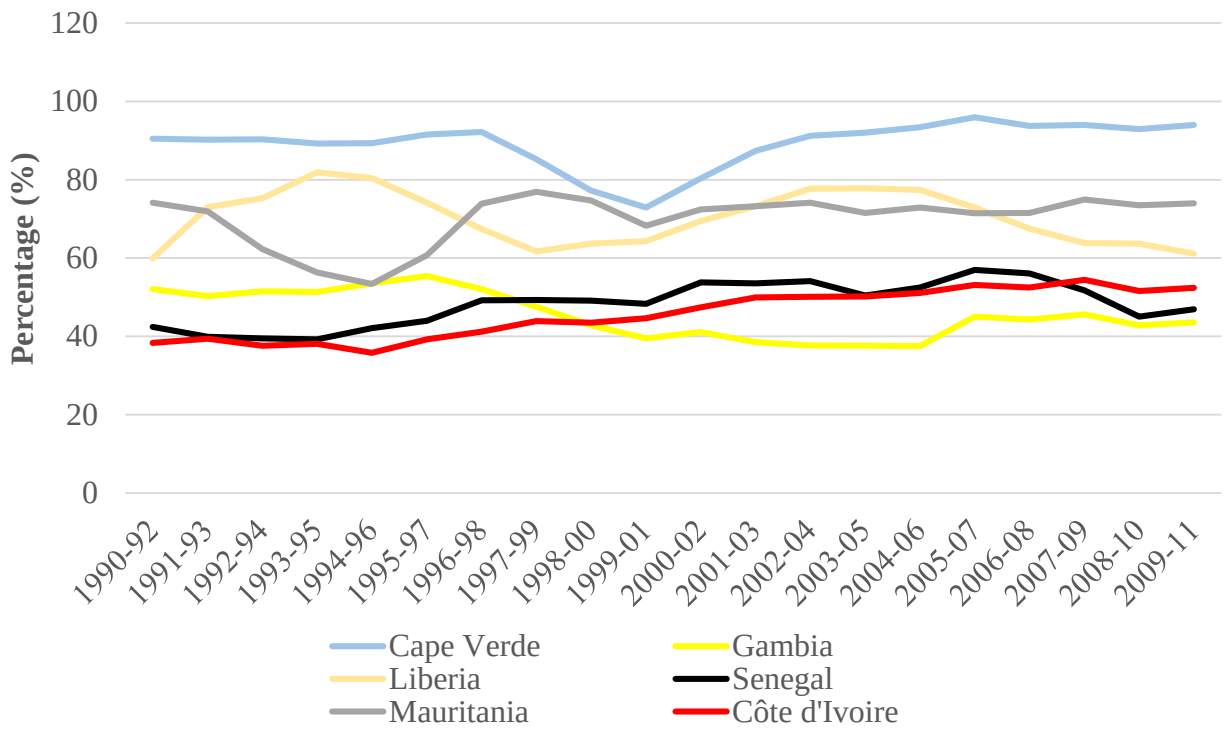

Figure 8. 3 –Year Average Cereal Import Dependency Ratio.
Source: FAOSTAT, 2015

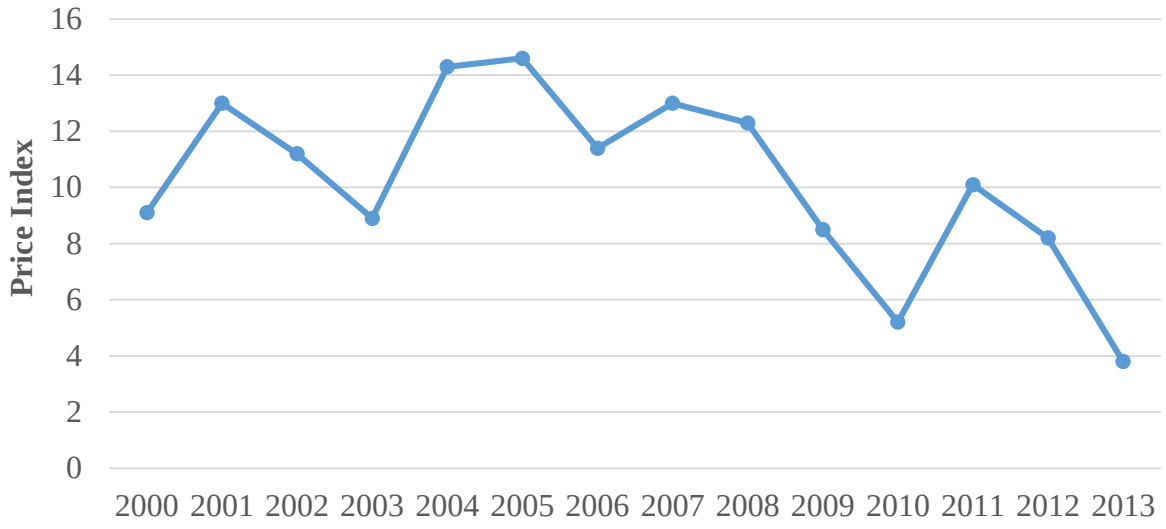

Figure 9: Domestic Food Price Volatility of West Africa.
Source: FAOSTAT, 2015

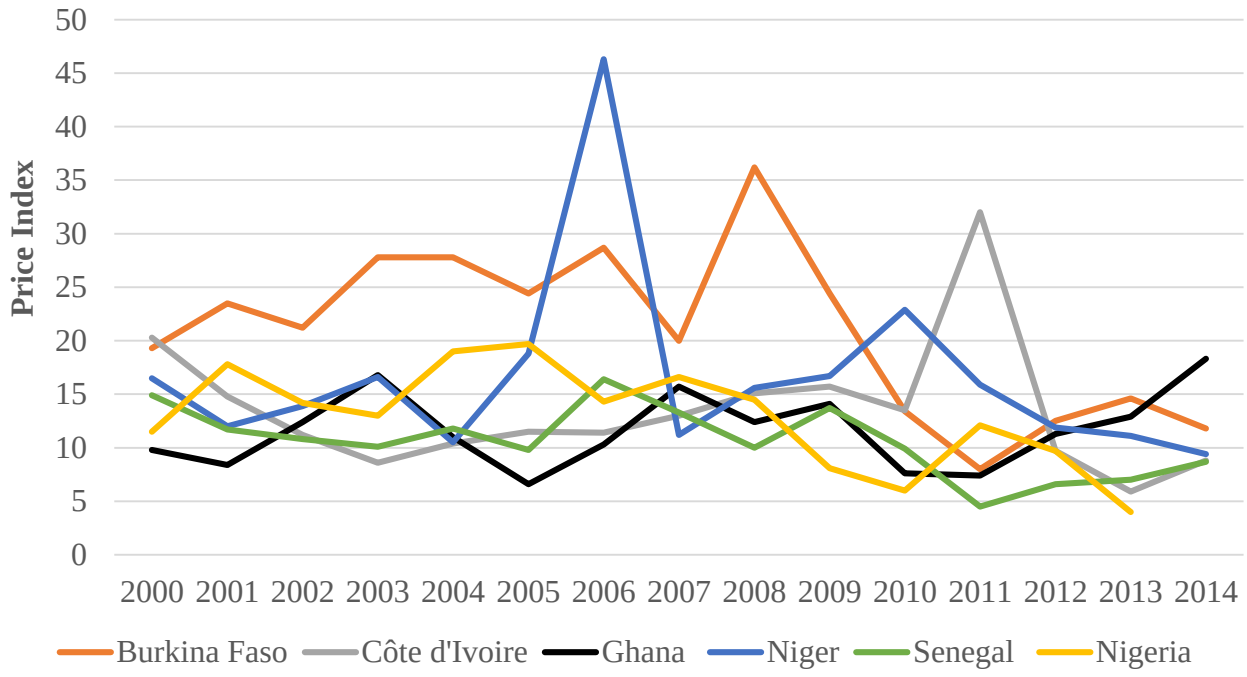

Figure 10. Domestic Food Price Volatility of some Countries in West Africa.
Source: FAOSTAT, 2015.

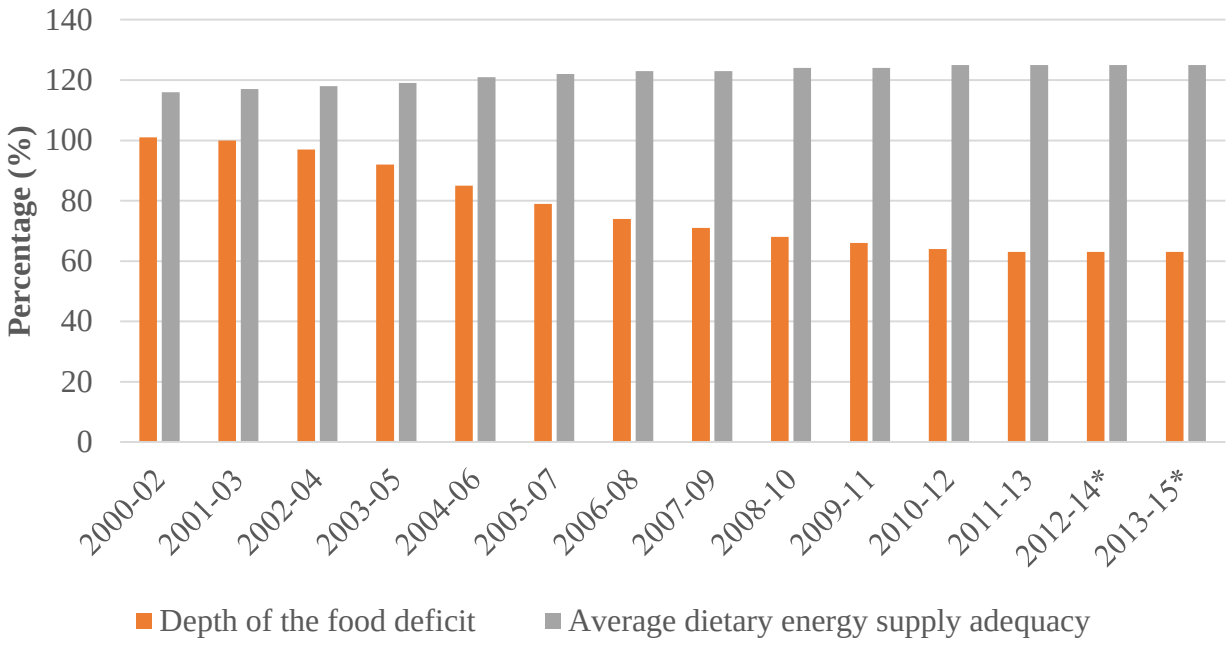

Figure 11. Depth of Food Deficit (kcal/caput/day) and Average Dietary Energy Supply Adequacy in West Africa. Source: FAOSTAT, 2015 *(projections).