Abstract: The chapter argues that more enabling policies on agricultural products production and trade should be encouraged. Policies should always be directed so that they are in line with major development goals. For example, the policy on subsidies should be reviewed based on its implementation challenges. Though there have been proposals to withdraw this policy, the pros and cons of this action should be critically analyzed because it can bring food production activities to a standstill, which may result into food insecurity. Secondly, the current market structure for some agricultural products is still facing challenges of continuously fluctuating prices, high production costs etc. and as a result some farmers may not be able to continue operations should the subsidy be withdrawn. The chapter also recommends a user-friendly agricultural system and simple but high output technology methods should be vigorously introduced and sustained by African governments, private sector, NGOs and farmers. This is for the purpose of increasing food production, food quality and food accessibility and availability which are essential requirements for food security and sustainable rural lives across the African nations.

URLs: https://www.novapublishers.com/catalog/product_info.php?products_id=30862

Author Address: rculas@csu.edu.au/

CRO Identification Number: 44244
ABSTRACT

According a Food and Agriculture Organization (FAO) report, Africa is the only continent where per capita food production has steadily declined for the past three decades. It is sad to observe from the report that while average per capita food production increased by 28 percent across the developing countries, Africa’s per capita yields grew by mere 4 percent against East Asia’s 45 percent and South Asia’s 16 percent. One of the obvious reasons is that even if Africa’s soils are the poorest in the world, there is no systematic effort to modernize the largely underdeveloped agricultural systems which could arrest the rapid depletion of the soil. Another 2010 FAO data show that of the world’s estimated 925 million hungry people, over 95 percent live in developing countries and 276 million of these people live in Africa. Practically, most of the African hungry people derive their livelihood from farming, which is characterized as low input based on unimpressive and low yield technology, rain-fed and single-crop system. The chapter found a multiple of factors that are political, economic, social and legal which impacts of food security and living stands in Africa.

It is evident from the chapter that many African countries are at present practicing poor traditional systems of farming. It is found that the issue of modern technology in agriculture has not been fully placed at the forefront of African development agenda as observed in NEPAD’s major priorities that concentrated on promotion of sustainable political and economic systems, democracy, equal opportunities for women and good corporate governance. The chapter argues that more enabling policies on agricultural
products production and trade should be encouraged. Policies should always be directed so that they are in line with major development goals. For example, the policy on subsidies should be reviewed based on its implementation challenges. Though there have been proposals to withdraw this policy. The pros and cons of this action should be critically analyzed because it can bring food production activities to a standstill, which may result into food insecurity. Secondly, the current market structure for some agricultural products is still facing challenges of continuously fluctuating prices, high production costs etc. and as a result some farmers may not be able to continue operations should the subsidy be withdrawn. The chapter also recommends a user-friendly agricultural system and simple but high output technology methods should be vigorously introduced and sustained by African governments, private sector, NGOs and farmers. This is for the purpose of increasing food production, food quality and food accessibility and availability which are essential requirements for food security and sustainable rural lives across the African nations.

**Keywords:** agricultural productivity, single-crop agriculture, farming and hungry people.
1. INTRODUCTION

Generally, agriculture forms the backbone of relatively all countries within the developing countries. It contributes a significant percentage to these countries Gross Domestic Product (GDP). This chapter aimed to support the view that African agriculture has been underdeveloped and thus needs a complete overhaul if it is to be a vehicle for producing enough food for the continent. An attempt is made to collect evidence of such difficulties being faced by the African farmers. This chapter is organized as follows: the key international policies on agriculture are presented in section 2 while section 3 focuses on agricultural subsidies including its impacts on Africa and Asia farmers. The rest of the sections concentrate on factors that are threats to food security in Africa. These factors are discussed under environmental, political, economic, social and technological subheadings. The last section made some conclusions and recommendations all aim at having a sustainable agriculture in Africa.

2. KEY INTERNATIONAL POLICIES ON AGRICULTURE

This section discusses international polices that are related to agricultural and food policies across the globe. It also includes discussion on the global food situation as a result of the current policies put in place.

2a) Policy on diversification of farm households: This has been an outstanding international policy on agriculture that is aimed at expanding agricultural activity in the global scene. As outlined by Eicher and Staatz (2003), farm households are the key players in the agricultural productions where they involve in various agricultural activities. Ellis (2000) argued that the role of farm households goes beyond agricultural activities to rural economy and development. Based on this phenomenon, the policy on diversification of farm households has been motivated by the desire to increase their contributions. In realization of this policy, the main issues of concern are the enhancement of incentives and the alleviation of barriers to effective agriculture (Denning et al, 2009). Governments are urged to increase incentives to farmers so as to facilitate their agricultural activities (Anderson, 2009). The policy on diversification of farm households is also aimed at forcing the key stakeholders in the agricultural sector to remove barriers to agriculture. This includes trade barriers, transport and technological
knowhow (Gardner et al, 2007). In this case it is the responsibility of the government to support its population in overcoming these barriers. The issue of financial assistance is also outstanding in this case, whereby governments have the responsibility of offering financial assistance.

2b) Rural economy and Land use policies: Stockbridge (2007) postulated that the nature of land use is a sensitive factor that determines the overall outcome of the agricultural sector. With this in mind, there has been the need to put in place efficient policies on land use. These are aimed at ensuring efficiency and effectiveness in agricultural activities. The issue of settlement is given significant attention based on its impacts on agricultural land. Other key elements considered in this policy include the issue of urbanization, whereby it has substantial influence on agricultural land. As noted by Liapis (2007) the land use policy also entails government intervention in land ownership and tenure systems. This plays substantial role in making optimum use of the available land. As a result of this policy, optimum utilization of the available land is attained thus boosting agricultural production.

The element of rural economy entails the involvement of the rural population in agricultural activities. This is closely influenced by the worth and value attributed to agriculture, whereby it plays a key role in economic development (Ellis, 2000). This policy ensures that all the rural communities are fully engaged in agricultural activities thus being able to enhance the rural economy and development. The issue of poverty reduction and job creation is attained.

2c) Policies on Bio-Security: There are diversified policies concerning the whole issue of biodiversity and environmental awareness. These policies restrict the nature of agricultural activities to ensure sustainability in continuity of life. For instance, the issues of distributing agricultural products, use of chemicals, and disposal of agricultural waste are adequately addressed. All these issues ensure sustainable development in the agricultural sector, whereby optimum attention on the environmental status is maintained (Lutz, 2001). Policies on the use of natural resources have also been formulated, which guide the manner of using various natural resources like, water, soil and forests.
A subsidy refers to a reduction in taxes imposed by the government on certain commodities with intentions to increase its consumption or encourage investors to invest in a particular sector (Garner, 2004). The concept of subsidy in the agricultural sector is very controversial concerning its influence in the entire agricultural sector and unlike in other sectors, the agriculture sector is treated exclusively, whereby governments offer numerous financial supports. This is usually induced by the need to increase food production and security as well as enhance agricultural exports. This is usually aimed at influencing the cost and supply of such commodities in the domestic and foreign markets. Nevertheless, the issue of subsidy is not warmly welcome in recent days among different nations. This is attributed to the unfairness it brings to the global market as well as the high expenses it posses to the concerned governments. The politics concerning the issue of subsidy is witnessed through the policy restructuring by WTO and FAO. These institutions have widely condemned the concept of agricultural subsidy. In response to the phenomenon, the WTO and FAO have urged for the scraping of agricultural and export subsidy (FAO, 2009). In the case of developed nations a subsidy reduction of 36% is required while 24% reduction is expected from developed nations (Swinbank, 2010). This is however executed in annual instalments. The issue has bee raised following the controversies facing agricultural markets, whereby a high sense of unfair competition and dumping of commodities is witnessed (Ingco and Nash, 2005).

In recent days, the developing countries have been opposing the extravagant subsidy offered in the developed nations. This is accused of causing unfair competition of agricultural products in the global markets. As indicated by Dewbre and Brooks (2006), subsidising agricultural products leads to the lowering of the final prices of the products. This usually comes as a competitive advantage to the farmers in the developed nations as compared to those from the developing world. As a result of these phenomenons, agricultural products from the developing nations are not in a position to compete perfectly with those from developing nations (Stockbridge, 2007). This is so because of the price and quality differences, where in this case products from developed nations are at lower prices and higher quality (Fischer, 2010). Based on this phenomenon, unfair competition arises thus increasing the negative politics concerning agricultural subsidy.
On the other hand, the politics on agricultural subsidy is strongly influenced by the increased expenditure on the governments. Support on agriculture has been termed as very costly as compared to support on other sectors like industry. For instance, the US is identified to be spending more than $20 billion annually to farmers (Josling, 2003). This is a very high expense thus puts unnecessary pressure on the treasury. The European Union has also been identified to spend over 39 billion pounds in the year 2010 on agricultural subsidy (Strauss et al, 2010). This extravagant spending in agriculture is what is adding on to the negative politics regarding agricultural subsidy.

3a) Impact of Agricultural Subsidy on African and Asian Farmers: Agriculture by its very nature is a source of food to the entire world. This calls for governments to ensure that people engage in agricultural activities to feed their nations despite the challenges. As a sector, agriculture faces various challenges some of which are beyond control by the people engaging in these activities. An example would be the fluctuation in weather conditions that sometimes lead to major losses to farmers who totally rely on rain for a successful harvest. To encourage investment in this sector, various governments have given subsidy to farmers on inputs for example fertilizer, seed plant, agricultural implement and machinery and low taxes on the income from agricultural activities (Chu and Lee, 2000). In Asia, with a specific example of China, introduction of subsidy in this sector has seen tremendous growth. The government abolished its taxation on agriculture and instead subsidized inputs for agricultural production. The main objective was to increase rural income and enhance food security. The same applies to Africa; there have been subsidies which have seen slight growth in the agricultural industry.

3b) Impact of Agricultural Subsidy on African Farmers: Whenever there is introduction of subsidy, the stakeholders especially the businesspersons normally feel a sigh of relief. Subsidies for example in South Africa are on cotton, vegetables, fruits etc. A country like Burkina Faso that has cotton as a major export item has suffered from fluctuations in cotton prices caused by the increase in subsidies given to cotton farmers by the US government. Subsidy to farmers at country level has impacted both positively and negatively on farmers and agriculture generally. Among the positive impacts is increased food production and hence food security within the country (Naylor and Falcon 2010). Subsidy has led to many people engaging in farming activities as farming is seen
as a more lucrative business. This has led to competition making the farmers to be more effective and efficient. Many people venturing in this field should translate subsidies to more quantity of the agricultural products being produced. This in turn leads to a surplus in production and hence food security (Molony and Smith, 2010). It acts as a source of encouragement to farmers. The farmers will feel that the government recognizes them as people taking a central role in the economic growth (Anderson and Nelgen, 2010). This in turn will boost their morale.

Subsidy has also led to increased revenue for the farmers and the government. By giving subsidy, the cost of production is low and this translates to high profits. It has led to creation of job opportunities locally. With many people venturing in this field, the core investors normally do not engage in the physical work on their own, instead, they employ farm managers and casual workers to do the work. This creates employment for the locals (Mandere et al, 2011). Increased agricultural activities facilitated by subsidy have led to rural development. Since most farm produce are perishable, for them to reach the target market in good condition, there has to be good infrastructural development. Roads must be constructed for increased accessibility; electricity should be available for perishables that may need refrigeration for example flowers. Learning institutions should also be established to train the locals on better and technology oriented farming activities.

The subsidy in the agricultural sector contributes an important source of savings for farmers. This will be as a result of increased income. This will boost the farmers’ social status in the society. Subsidy helps in eradication of poverty among farmers. This is because they will have a source of income and stable supply of food for them and their families (Pali et al, 2011). The negative impacts are situations where the subsidy is meant to enable small scale farmers get rid of poverty (Pauw and Thurlow, 2011). Instead, the major beneficiaries are normally commercial farmers who do large scale farming. Subsidy has increased the value of land keeping many farmers who would wish to expand their farming at bay. The farmers who own big pieces of land are not willing to sell their land due to the lucrative business. If they opt to sell the prices are normally too expensive for ordinary or small scale farmers to afford (Timmer, 2011).

One of the objectives of subsidy is to ensure that farmers get good returns from the farming activities. This happens by subsidy on farm implements, seed, fertilizer and
other agricultural inputs reducing the cost. This will lead to overall reduced cost of production hence more profits to the farmers. Coincidentally, the introduction of subsidy has led to overproduction of agricultural produce. From economics’ law of demand and supply, when supply is higher than demand, prices will always go down (Johnson, 1975). This has led to farmers panic and being desperate with their harvest hence selling at a price that cannot even cover the costs of production for fear that the produce may as well go bad before selling. This is against the major objective of subsidy and the farmers will not be able to get the expected returns. Finally, subsidy most of the time means tax is diverted to the other bases of taxation, in most cases, abolishing of one tax normally leads to imposition of a new tax on a different item or increasing the tax rate on some item. This will result into a high tax burden for both the farmers and the citizens.

Globally, subsidy has led to increased revenue for farmers since some of their produce is exported. The export prices are usually very competitive and most farmers prefer to sell their produce in the international market. Subsidy promote increased agricultural production, these are usually sold in the international market as highlighted above. Farmers take trips to the international market and in the process acquire new knowledge from interaction with their fellow farmers. This knowledge can also be acquired by attending international trade fairs which they will bring back to their respective countries for implementation.

3c) **Impact of Agricultural Subsidy on Asian Farmers:** Asian continent has some countries in which subsidies have really played a major role in their agricultural prosperity (Daniel and Kilkenny, 2009). Farmers in these countries have enjoyed a vast range of subsidies to promote food production and enhance income of farmers. China for example, in coming up with its agricultural policies in the year 2004, introduced subsidies in the form of withdrawal of tax on purchase of seed and machines (Chu and Lee, 2000). The country almost doubled its expenditure in subsidy between the years 2005 and 2008. In 2005 the country spent approximately 309.6 billion renminbi in subsidies while that of 2008 rose to 593 billion renminbi. Subsidies are mainly on wheat, rice, maize etc. It has also been remarked that subsidies in China is quite unfair. There is different treatment for different industries when it comes to subsidies. Subsidies for example preferential lending are given to favored industries. Internationally, this may
result into unfair competition since some subsidies are aimed at foreign funded investments. There is international complaint on the impact of China subsidies. World Trade Organization has raised alarm on China subsidies because of its price distortion impact in the world market prices (Timmer, 2011). The country engaged in marketing of its agricultural produce both locally and internationally. Loans were granted to farmers at a reduced interest for the purposes of encouraging farmers who did not have capital to be able to carry on farming. The country also engaged in massive rural infrastructural development. All these were meant to reduce the urban-rural income gap and achieve increased food security.

The subsidies created a very conducive agricultural environment both to local and international farmers. They were encouraged to work harder by the brighter future in this sector. They could see higher returns, this motivated their morale. As the returns increased, many people joined the sector. The impact of subsidy on farmers in Asia has seen success in this sector and even influenced the level of technology. The subsidy has seen farmers’ income levels rising and in result reduced poverty levels (Bahiigwa et al, 2005). Increased farming activities due to subsidies have led to improved infrastructural development and farmers are able to access the local and international market more easily. The farmers have also benefited from increased research. Subsidies led to increased farming activities which in turn led to more research on better ways of farming. The China government for example, took up the research on agriculture by opening several institutions. As many investors were attracted by the good policies adopted and a supportive government, many people got involved in agricultural activities and this finally led to food security in the country.

Globally, subsidies have seen the farmers in Asia getting international recognition. Most Asian countries for example Pakistan are a major rice exporter. This success can be attributed to government subsidy and domestic support in the form of financing agricultural projects at favourable financing terms. This in turn has given the government revenue for foreign trade, the citizens have more food security and income is enhanced (Chu and Lee, 2000). Farmers have achieved economic empowerment from foreign trade of their produce. There has also being new technology being embraced by
the farmers to improve on their agricultural skills and production efficiency (Buah et al, 2011).

Most Asian countries are however contemplating reviewing their policies on subsidy due to some ineffectiveness in line with the major objectives of these policies. These objectives included increased in grains production and food production and hence food security, eradication of poverty, increasing the income of small holder farmers etc. Since the implementation of this policy, there has been a declining trend in grain production save for the first few years of implementation of this policy. The small holder farmers who were to benefit from the policy on subsidy so that they could improve their income are not the major beneficiaries. The large commercial farmers took up this opportunity; the policy indicated that subsidy was to be given based on the area of cultivation. Most of these small holder farmers operate in small pieces of land and hence the amount given was also relatively low. These small holder farmers could not compete with the large agribusiness firms at the same level hence there was very slight progress. They could not do farming large scale as they could not afford to buy land (Mbote et al, 2008)

Notably, the impact of subsidies on farmers has major similarity in the two continents with a slight difference on technological advances in the Asian countries and the same should be embraced by African countries. The aspect of combining the policy of subsidy and other policies for example offering financial support has also ensured success in agriculture in Asia (Carmody, 2009). The intentions to review the policy on subsidies in Asia should be done in a manner in which it will not affect the level of production. If it were to affect the level of production; this could be the start of problems related to food insecurity.

3d) Comparison of the Impact of Subsidy at Global Levels: The impact of subsidy on small holder farmers in Asia is relatively positive as compared to African countries and even The United States of America. This is because the subsidy policy is highly concentrated in the rural areas where the small scale farmers are mostly found. Another reason for better benefits to the small scale farmers is because the subsidy is based on the area of land cultivated. In Asia there has been the issue concerning ‘black land’ which is land cultivated but is not disclosed to the authorities. This has questioned the accuracy of
the Asian figures on the impact of subsidy, there are pieces of land that are cultivated but disclosure to the government is not done (FAO, 2009). Though there has been a world cry on the benefits of a subsidy on both the large commercial farmers and the small holder farmers. In both continents the subsidy has led to a modest increase in rural farmers’ income. Compared to Africa, Asian rural farmers’ income is slightly higher and this implies that the small scale farmers in Asia have benefited more. The subsidy policy is faced with the challenge of withdrawal due to the insignificant role it plays in the overall output of agricultural produce.

In Africa, Asia and the United States, the policy on subsidy has to a greater extent gone against its major objectives. The initial intentions were to boost income of small scale farmers, increase grain production, enable farmers have competitive prices for their produce among others. There has instead been overproduction leading to diluted prices barely enough to cater for the cost of production. The benefits of subsidies have been felt more by the larger commercial farmers as opposed to the small scale farmers whom it was intended to benefit.

In the United States, the agricultural tariffs are relatively higher compared to those of developing countries and there have been complaints that it should be reduced (Haggblade, 2011). The big agribusiness firms are benefiting from the subsidy and as a result have dominated the market; they set prices that would be unfavourable to small holder farmers, this discourages them and keeps them out of business (FAO, 2009). The other negative effect on small scale farmer in Asia, Africa and United States is the poor land tenure laws, uncoordinated agrarian structure and the land reforms which never seem to be implemented by the respective governments. The small scale farmers cannot afford to buy land whose value is very high and this has stopped them from increasing their level of operation, they will remain to be in the category of small scale farmers.

Though there are quite a number of similarities on the impact of subsidy on small scale farmers in all the three cases, the policy on subsidy by African countries still needs to be reviewed to be more enabling for farmers. The system is poor compared to those of Asia and United States. A comparison of impact of subsidy on maize for instance in Africa, Asia and US can be made as follows; in Malawi, the impact of subsidy on maize that was funded by the Government of Malawi, United Nations Development Programme
among others saw the country almost triple its maize production from a 43% national food deficit in 2005 to a 53% surplus in 2007. In China, the subsidy on grain production led to a slight increase in the quantity produced in 2004, this almost declined in the succeeding years. The impact was slightly felt. US on the other hand experienced overproduction which in return led to major price fluctuations.

4. ENVIRONMENTAL THREATS TO FOOD SECURITY IN AFRICA

Environmental factors have been the main threat to food and agriculture in Africa. Sage (2010) indicated that the environmental phenomenon in most parts of Africa is not favourable for agriculture. Most of the African nations lie in the tropics, whereby they experience dry and hot climate. This is usually unfavourable for productive and profitable agriculture. To begin with, the climate in Africa has been identified to be predominantly tropical in nature. This is classified into humid temperate, humid equatorial and dry climate (Nelson, 2009). Nevertheless, localized variables and altitude usually leads to other distinct regional climates. Despite this diversity in climate, it has been identified that the dry tropical climate is dominant in most of the regions. This is very unfavourable to agriculture following the inadequate rain as well as the high temperatures (Sulieman, 2010). Most of the African regions are facing long drought seasons and short rain seasons thus making it impossible for the cultivation of different crops. These phenomena jointly threaten food production and agriculture in Africa.

The unfavourable climatic conditions in Africa have led to unavailability of water for agriculture. Most of the regions are served by seasonal rivers and dams, thus making it impossible to substitute rain fed agriculture. In regard to the dry climatic conditions, most of the African regions have insufficient water supply that can be used for agriculture. The water table has also been shown to be at devastating state thus discouraging irrigation (You et al, 2011). From another perspective, the concept of irrigation has not been possible in Africa due to lack of insufficient ground water as well as poor technology (Nelson, 2009).

Sage (2010) postulated that exacerbation of drought periods has posed a serious threat to food production. Most of the African regions have been experiencing extended dry seasons. This makes it hard for many plant species to survive. Exacerbation of
drought periods causes retardation of growth to the grown crops thus leading to declining yields. Only tropical crops can withstand the high temperatures and the adverse climatic conditions. These crops are however not highly productive, thus jeopardizing the production of adequate food (Atehnkeng, 2007). Most of the sub-Saharan countries are unable to produce adequate food to sustain their population following the dry and hot conditions which do not favour food production (Chuku and Okoye, 2009).

The level of soil fertility in most parts of Africa has also been devastating. As postulated by Callahan (2002), most of the regions of Africa are not favourable for agriculture due to poor soil. This is associated with the issues of soil erosion as well as poor farming methods which lead to deterioration of soil fertility. The economic and technological challenges also make it impossible for most of African farmers to adopt inorganic fertilizers and manure (Bosede, 2010). With this in mind, food production and agriculture is inhibited in Africa.

4a) Bio-Fuel Production: Bio-fuel production is rapidly taking course in the global platform and Africa is not exempted. According to Macaskill (2009), the issue of renewable energy is becoming a potential substitute and complement of fossil fuel. This is in relation to the declining supply of fossil fuel as well as the ever increasing prices. In regard to this situation, the world population has diverted efforts to the production of bio-fuels for industrial and domestic use. In the case of Africa, the production of bio-fuels has in the recent grown to alarming levels. This has been witnessed in the last two to three decades, where large scale production of feedstock to support the production of bio-fuels is being witnessed (Mitchell, 2010). This phenomenon does not come singly in the sense that it has had significant impacts on food production and agriculture as a whole.

Tepe et al (2011) observed that bio-energy is rapidly replacing the use of fossil fuel, which is associated with atmospheric destruction. In this case, the production of bio-energy includes the use of varied forms of organic matter. This includes charcoal, manure, wood, energy crops, and agricultural forestry and waste. The major forms of bio-fuels include bio-ethanol, bio-diesel, bio-gas, bio-methanol, and bio-hydrogen. All these forms of bio-fuels are produced form different agricultural commodities. Some of the commonly used agricultural commodities for producing bio-fuels include wheat,
sugarcane, sorghum, cassava, maize, soybeans, corn, algae, jatropha, and oil palm (Atehnkeng, 2007).

In regards to agriculture and the production of food, bio-fuel production has been a serious challenge. As postulated by Callahan (2002), the production of bio-fuels in African has threatened food production. This has been very evident in most of the African states, whereby the production of feedstock related with the production of bio-fuels has been in the increase (Tepe et al, 2011). It has been noticed that the production of feedstock for bio-fuel production in Africa is conducted mainly by foreign farms. This has led to huge investments in the participating countries thus diverting farmers from the production of other food crops. As argued by Macaskill (2009) the production of feedstock to support bio-fuels is threatening food production. This is so because a lot of land that was under food crops is being replaced by feedstock for production of bio-fuels (Hadjor, 2000). Based on this phenomenon the production of food is in a rapid decline due to the large acreage under feedstock for bio-fuel production.

Despite that the production of feedstock is undertaken across the globe, Africa has been the most threatened in terms of food production. This is so because there has been an historical deficit in food production thus showing the need for more attention on the production of food crops (Mitchell, 2010). In this regard, the increased attention on production of bio-fuels in Africa is jeopardizing food production. Since most of the agricultural activities related with production of food crops are unprofitable, people are shifting to the lucrative production of bio-fuels. This is in turn worsening the food security and price variability of food commodities in Africa (Mitchell, 2010).

Despite that many countries in Africa like Senegal, Mozambique, Tanzania, Zambia, Mali, and Kenya have copious amounts of unused land; the production of feedstock is being undertaken on the currently used land (Mitchell, 2010). This has been witnessed in the focus on producing jatropha, sugarcane, and sorghum on lands that were under other forms of food crops like wheat, millet and maize (Hadjor, 2000). Without regulation and proper strategizing on the production of feedstock, the production of food commodities will come to a stand still. It is of great importance to note that the total acreage under food crops is under rapid decline. This poses a series threat on agriculture and food production (Sage, 2010).
4b) Climate Change: The issue of climate change is becoming a menace in the global community in recent days. This has been much felt in the 21st century, whereby serious climatic changes and conditions have been realised (Lybber and Stumner, 2012). The most felt aspect of climatic change has been the issue of global warming (Murad et al, 2010). This is characterised by rapid increase in the average temperatures of the land, sea and the atmosphere. Other aspects of climate change include prolonged droughts, increase in tsunamis, variation in rain patterns, and shortening of rain season (Simms et al, 2004). Despite that the menace of climate change has been felt all across the globe, its effect has been much felt in Africa. This phenomenon is posing a serious threat to agriculture and food production in Africa.

Mongi et al (2010) postulated that climate change is impacting strong barrier in the undertaking of agricultural activities. Atehnkeng (2007) observed that climate change threatens food production across the sub-Saharan region of Africa. The issue of climate change has led to a significant decline in the annual agricultural output in Africa. This is attributed to the decrease in the land acreage under food production as well as the massive destruction of agricultural products. Following the issue of climatic change, many farmers have been obstructed from optimally participating in agricultural activities (Murad et al, 2010). This is brought about by the changing climatic patterns, which brings uncertainty on amounts and patterns of rain.

As observed by Sage (2010), climatic change has led to a series of misfortunes in conducting agricultural activities. For instance, there has been an increase in flooding in most of the regions of Africa. This is associated with climatic change which cause long dry seasons and ultimately heavy down pours. This phenomenon leads to massive destruction of farm produce. As a result of this situation, the overall concept of food production in Africa is affected. In addition, the changes in climatic conditions have been worse felt in Africa due to low technological know how (Buah et al, 2011). This has obstructed timely forecasting and preparation for issues like floods as well as long dry spells.

Climate change has led to a drastic decline in water availability thus obstructing agricultural activities. The changes in climate have led to disappearance of rains in regions which were previously receiving rainfall (Murad et al, 2010). In regard to this
scenario, water availability goes down thus jeopardizing agricultural activities. Ground water which is a product of rain water is constantly diminishing in many regions. This is as a result of increased dry seasons and shortened rain seasons. As a result of this phenomenon, the whole issue of agriculture and food production is put at a state of jeopardy (Sulieman, 2010).

The availability of human resources has also been negatively impacted by climate change thus deterring intensive agricultural activities. As depicted by Nelson (2009), climate change causes manifestation of vector born diseases. In this case, an increase in temperature and humidity induces ideal conditions for malaria. Sleeping sickness among other infectious diseases are also as a result of climate change. These phenomenons have a direct impact on agriculture in the sense that they affect the availability of labour (Sage, 2010). This phenomenon is much evident in Africa, where human power is the main source of labour for conducting agricultural activities.

In regard to the above analysis on the issue of climate change, it is evident that serious challenges come up that obstruct agriculture. Climate change has also led to the development of unfavourable conditions for conducting agriculture (Murad et al, 2010). This in turn adds on to the cost of agricultural operations thus reducing the profit margin. Immense destruction on agricultural commodities as a result of climate change also adds on to losses and cost of undertaking agriculture. In reference to these situations, most of the agricultural producers in Africa quit agriculture and look for other ventures (Simms et al, 2004). This in turn leads to a decrease in food production and deterioration of the entire agricultural sector.

4c) Other Environmental Threats to Food Security in Africa: Despite climate and soil fertility being the main environmental barriers to food production in Africa, a number of other environmental factors have also been identified. Callahan (2002) has postulated that the topography of most of the African regions is not favourable for agriculture. This is basically presented by the hilly and irregular topography. Most of the areas with favourable climatic conditions are in the hilly and upland areas (Sage, 2010). These regions are usually unfavourable for large scale and intensive commercial farming. The main barrier caused by this unfavourable topography is the use of heavy machinery. Unlike other continents, whereby huge chunks plateau like lands are available, in Africa
it is the direct opposite (Simms et al, 2004). This is usually for the case of fertile and humid regions. Most of the flat regions in Africa are dry, thus inhibiting agricultural activities.

Forest cover on most of the humid regions has also been an environmental barrier to food production in Africa. In relation to the fact that most of the African regions are dry, the few wet and humid regions are covered by forests and bushes. This is very evident in the tropics and mountainous regions. Keskin et al (2010) postulated that the cultivation on these forested areas is a big challenge following the unavailability of machinery and technology. The issue of pests and insects is also a product of these forested areas. This prohibits livestock farming near the forested areas. For instance, the Tsetse fly has been identified as a dangerous insect to the rearing of livestock (Tettey et al, 2003). These insects are responsible for a number of animal and plant diseases thus leading to massive damage and losses to the farmers. As result of this phenomenon, food production and agriculture in Africa is obstructed.

The desert conditions of most of the African regions are also a key obstruction to agriculture. As depicted by Atehnkeng (2007), most of the regions bordering the Sahara, Kalahari and Namib deserts among other small deserts in Africa are unfavourable for agriculture. This is due to the extent of the desert conditions to these regions as well as the menace of deserts (Sage, 2010). With this in mind, it is explicit that food and agriculture is severely obstructed in Africa.

5. POLITICAL AND ECONOMIC THREATS TO FOOD SECURITY IN AFRICA

Agriculture and food production in Africa has also been closely influenced by political and economic factors. Like any other sector the issues of politics and governance are very influential on the agricultural sector in the case of Africa. Politics and economics have been strong barriers to agriculture. According to Nelson (2009), most of the African nations have unstable governance due to lack of political will and negative ethnicity. This has led to a series of civil wars. For instance, Somalia, DRC Congo, Sudan, and Ivory Coast have in the recent been engaged in political instability. This has ended up jeopardising agriculture in the sense that farmers fear looting and destruction of produce (Simms et al, 2004). The civil wars have also led to the fleeing of people from their land,
thus leading to under utilisation of the agricultural potential of land. Through this process, the overall output from agriculture is reduced.

Political instability has also locked out potential agricultural investors. Foreign firms which have interests in conducting agricultural activities in Africa are de-motivated by the political orientation of most of the nations. This is due to the fear of making losses as a result of looting and mass destruction of property. Callahan (2002) observed that, political instability leads to bad foreign relations. This in turn influences the willingness of foreign investors to invest in these countries. As depicted by Tettey et al (2003), the absence of foreign investors in Africa leads to under exploitation of the agricultural potentials of the continent.

The aspect of politics is also strongly related with policy making and structuring of the agricultural sector. Most of the African leaders have been identified as lacking political responsibility and will (Sage, 2010). This perhaps causes reluctance in the formulation of policies and programs that support and encourage agriculture. For instance, the issue of land policy has been deliberately neglected by the governments. This is closely influenced by corruption where many of the political leaders have been associated with grabbing of land and later leaving it under utilised (Tettey et al, 2003). Land of proper policies on land use has also initiated careless use of land, whereby human settlement is creating strong pressure on agricultural land.

Economical barriers have also been at a high level in Africa. As depicted by Atehnikeng (2007), most of the African nations are economically poor, whereby poverty levels and unemployment are at an alarming rate (Pauw and Thurlow, 2011). The per capita incomes in most of the Africa countries are also low thus obstructing investment. The economic crisis in Africa does not only affect agriculture but all sectors (Macaskill, 2009). In the case of agriculture, the economic backwardness of most of the nations has led to little investment in agriculture. Most of the farmers are incapacitated from acquiring the much needed capital for engaging in extensive commercial agriculture. For instance, the price of buying farm machinery among other farm inputs is very high (Simms et al, 2004). This phenomenon makes many people to engage in small scale farming which does not offer the much needed output.
5a) **Trade Barriers and Restrictions:** Trade barriers and restrictions in the international market has been a serious barrier to agriculture in Africa. As depicted by Macaskill (2009), the world market has been dominated by irregularities which obstruct fair trade. Callahan (2002) noted that African nations are not offered the chance to trade fairly in the global markets. This is usually a result of the discriminatory trade barriers set by international trade organisations which have an alignment to the western nations.

As postulated by Nelson (2009), most of the agricultural products from Africa do not sell fairly in the foreign markets. This is brought about by the strict trade barriers offered by the western nations like the EU. In this case, high tariffs are set on the importation of agricultural commodities from outside the trading zones (Sage, 2010). In regard to these situations, the agricultural producers from African find it unprofitable to export products to the foreign markets. This in return weakens agricultural activity in their countries. It has also been evident that many African nations are forced by the western communities to set tariffs that favour imports. This leads to the importation of cheap agricultural products which unfairly competes with the local products. Atehnkeng (2007) indicated that this unfair competition and technical barriers to trade are killing agriculture in Africa.

The political and economic superiority of most of the western nations has been the main cause of the discriminatory trade barriers. In this scenario, the African states are not in a position to obstruct or boycott the discriminatory barriers and restrictions. This is in relation to the aid and debt burden they have in relation to the western community. Salih (2009) argued that the discriminatory trade barriers have led to the de-motivation of the African farmers. This is because the trade barriers increase the cost of food production and agriculture in Africa.

5b) **Governments Policy Uncertainty:** The issue of policy making in Africa concerning agriculture has been at jeopardy. Most of the African governments have been demonstrating reluctance and lack of commitment as far as agriculture is concerned. Strong political will towards improving agriculture in African has been lacking. This has led to the existence of inefficient and discriminatory policies as well as structures for guiding the agricultural sector. The policy crisis in Africa has been a strong challenge to
agriculture in the sense that it has hardened the process of undertaking profitable agriculture (Macaskill, 2009).

The land use policy is the main area under concern as far as Africa is concerned. Most of the nations in Africa have inefficient or no policies concerning land use thus inhibiting agricultural development (Simms et al, 2004). The prevailing policies on land use are inefficient and discriminatory in that they have led to misuse of land which would have been otherwise used for agriculture. Proper planning on settlement has also been out of place. This has led to the imposition of high pressure on agricultural land by human settlement. Since the African population is increasing at a very high phase, there is great need to establish proper structures on land use (Tettey et al, 2003). This will ensure adequate land for settlement and agriculture. The issue of conflicts will also be resolved through fair issuance of title deeds and policies on land ownership.

Policies on agricultural development have been uncertain in Africa. A report by Sage (2010), shown that many states in Africa have not established efficient policies on agricultural development and support programs. For instance, the issue of subsidising agriculture and training farmers has not been prioritised. This is in contrast to the developed nations, where the agricultural sector has been prioritised. Lack of subsidising agriculture in Africa has made the concept of undertaking agriculture very expensive (Hadjor, 2000). The various technical and financial challenges facing farmers are not well addressed by the governments. It is worth noting that support in agriculture would have led to expanding of agricultural activities to all levels of the population. For instance, most of the poor rural community are locked out of undertaking agricultural activities due to lack of capital (Ellis, 2000). This can be efficiently addressed by the government through provision of subsidies to farmers.

A key policy issue in agriculture is the concept of agricultural trade regulations. Like other sectors of the economy, agricultural trade need to be regulated and protected. This requires adequate government commitment in policy making to protect the local farmers (Salih, 2009). For instance, the setting of tariffs and trade barriers should be put in place to protect the local farmers. In the case of Africa, the issue of policy making has been out of place, whereby most of the governments are not willing to set proper policies and structures to regulate trade (Macaskill, 2009). This situation leads to the dumping of
cheap agricultural products from foreign countries, thus creating unfair competition to the locally produced products. Political and economical influence from the western nations has also been identified to negatively affect policy making in African nations. As stated by Atehnkeng (2007), the western nations use their political and economic powers to influence policy making in the African nations. This in turn contributes to the crisis in the agricultural sector in Africa.

5c) **Oil and Gas Prices movements:** Instability in the energy sector has in the recent led to a serious calamity in all the sectors of government. In this regard, the agricultural sector has not been exempted. The recent price movements of oil and gas have negatively impacted on the agricultural sector in Africa. To begin with, the fluctuations and increase in oil and gas prices have led to an increase in the cost of doing agriculture. Hadjor (2000) depicted that, increase in oil price leads to higher costs of acquiring agricultural inputs and machinery. Most of the agricultural machinery is dependent on petroleum oil. This leads to doubling of the cost of agricultural operations. The overall effect of this phenomenon is a reduction in the profit margin as well as losses in the agricultural sector (Sage, 2010). This phenomenon leads to exit of many potential farmers thus leaving a deficit in agricultural production.

Fluctuations in oil and gas prices have also created uncertainty in calculation of the cost of doing agriculture. This situation increases anxiety among farmers thus influencing decisions on taking agricultural risks. In response to this situation, many potential investors in agriculture divert their resources and capital to other sectors thus leaving the agricultural sector under utilised (Salih, 2009). From another perspective, the issue of petroleum oil and gas prices movements have led to the commitment in the production of bio-fuels. This has led to a serious threat in agriculture. As observed by Tettey et al (2003), the concentration on bio-fuels has led to shifting of agriculture of food products to the production of feedstock to support manufacture of bio-fuels. This is related to the high returns from the farming of feedstock required for bio-fuel manufacture. Based on this scenario, agriculture of food commodities has ended up being abandoned.

5d) **Political Instability and Wars:** The menace of political instability is creating a strong barrier to effective agricultural activity. As observed by Callahan (2002), many
African nations have not reached political maturity. This has been witnessed through the series of political instability and civil wars across the continent. This has had a negative impact on agriculture in that it has led to paralysing of agricultural activity. Simms et al (2004) indicated that political instability has led to misuse of funds that would have otherwise been used in supporting agriculture. Many African nations like DRC Congo, Sudan, and Somalia are using much of their time and finances in war. This leads to no time and resources for productive activities like agriculture. As a consequence of this situation, agricultural status in these nations has been jeopardised.

The problems of political instability and civil wars in many of the African communities have also led to obstruction of donor support and foreign investment in agriculture. Many western nations have cut down their support to war torn nations in Africa as well as those dominated by endless political instability (Haggblade, 2007). This is in fear of corruption and misuse of funds, thus worsening the agricultural status in the continent. Political instability in African nations has also induced unstable foreign relations. This jeopardises chances of getting potential markets of agricultural products from these nations (Salih, 2009). This is so because the governments in war torn countries fail to put in place strong structures for guiding agricultural production and trade.

As argued by Hadjor (2000), civil wars in most of the African nations have been influenced by poor distribution of national resources. The issue of land distribution has also been a vital crisis. In regard to this phenomenon, people are chased out of their ancestral land and live in camps. Macaskill (2009) depicted that the extent of civil war in Africa is at an unacceptable level thus the need for readdress. This has been evident through the number of refugees who have left their land. This scenario has negatively affected agriculture in the sense that huge chunks of land are left idle.

5e) **Other Political and Economic Threats to Food Security in Africa:** Atehnkeng (2007) postulated that the concept of transparency and accountability in Africa is a thing of the past. Since the colonial era, most of the African nations have been characterised by high levels of corruption and mismanagement of public funds. In this case, the agricultural sector has been badly affected in that money set for various projects goes missing (Sage, 2010). Many projects initiated for enhancing the agricultural sector end up
collapsing due to lack of strong political will and responsibility. It has been sad to note that many donor countries have withdrawn their support for Africa due to corruption. This has been in place for quite some time, whereby huge sums of money set for agriculture have gone missing (Tettey et al, 2003). In result of this phenomenon, the agricultural sector in Africa remains unfunded or under funded hence the enormous inefficiency.

The issue of corruption has also been evident in the whole issue of agricultural subsidies. Following the huge sums of money injected to support farmers, few individuals end up siphoning the funds (Hadjor, 2000). This creates a huge burden to the government as well as the tax payers. Corruption and lack of transparency in distribution of agricultural subsidies have led to many African governments withdrawing the program. This has left the burden to the farmers who end up exiting from the agricultural sector due to the enormous challenges. Corruption in Africa has also been dominant in the cases of foreign trade (Simms et al, 2004). In this case, top government officials break the government policies and regulations on importation of agricultural products produced in the country. This leads to unfair competition in the local market thus challenging the local famers.

In the case of economic factors, most of the African nations have failed to put in place economic policies and structures that support the agricultural sector. This is usually in the aspects of economic policies concerning foreign trade. For instance, the reduction of tax on the importation of agricultural imports has not been adequately addressed (Nelson, 2009). In addition, the African governments have also failed to give stimulus packages on the agricultural sector. This would have otherwise led to alleviation of the economic challenges facing the players in the sector. Encouragement on the consumption of local products has also been obstructed. This can be achieved through the reduction of tax on locally produced products (Macaskill, 2009). By so doing, the products will sell at lower prices thus increase their demand in relation to imported products.

The issue of political will in most of the African nations in regard to agriculture is gaining strong controversy. As depicted by Callahan (2002) African governments have shown high levels of reluctance as far as support to agriculture is concerned. This has been evident through the negative politics towards government support on agriculture.
Many political leaders have been caught advocating for the scraping of agricultural subsidy among other developmental support on agriculture (Atehnkeng, 2007). It has been sad to note that many political leaders argue that support in agriculture is not economical and only leads to misuse of natural resources. In their opinions, different political leaders and policy makers in Africa advocate for free competition in the agricultural sector (Tettey et al, 2003). This can however not favour African producers in the sense that developed nations will efficiently produce higher quality but cheaper products. With this in mind, agriculture in Africa remains at crossroads.

6. SOCIAL THREATS TO FOOD SECURITY IN AFRICA

Agriculture in Africa is strongly influenced by social factors. This entails all factors related to population and the people’s way of living. Different scholars on the topic of agriculture in Africa have shown that social factors have been a key threat to food production and agriculture in Africa. According to Salih (2009), the issue of demographics has been the main challenge to effective agriculture in African. In this regard, there has been absence of adequate policies regulating demographic patterns thus impacting negatively on agriculture. The major social factor inhibiting agriculture in Africa is the issue of rapid population growth

6a) Rapid population Growth: The population growth of Africa has been termed as the highest in the world. The population of Africa is projected to double by the year 2050 if measures to regulate population are not undertaken. Current statistics indicate that Africa will soon pass one billion people and this may have already been reached at present days (Sage, 2010). Despite the various health, social, political, environmental and economical challenges, the growth rate of Africa remains in the high. This is not only good to the economy but also bad if not properly planned. In the side of agriculture, the rapid population growth is creating a lot of havoc. This has been explicitly explained by different scholars who have profoundly analysed the phenomenon. Despite that high population offers labour and knowhow in enhancing agricultural activity, the current population trends in Africa are devastating (Simms et al, 2004). This is so because the increase in population is threatening agriculture and food production instead of facilitating them.
To begin with, increase in population is leading to immense pressure on the available agricultural land. Potential agricultural land is currently being used for human settlement (Nelson, 2009). This phenomenon is rapidly reducing the total acreage under agriculture. In most of the African nations, the rate of replacing agricultural land with human settlement has been at a very high rate. This is not only influenced by rapid population growth but also due to poor government planning on settlement. As observed by Callahan (2002), the rate of population growth has not been controlled. In this case, family planning strategies have not been optimally put in place. This has led to the high population increase thus leading to pressure on agricultural land.

Rapid increase in population is associated with destruction of environment in Africa thus threatening agriculture. For instance, many forested areas, swampy land and water lands are currently being destroyed for human settlement and other economic activities. These phenomenons have led to the alteration of climate thus affecting agriculture. As observed by Hadjor (2000) destruction of forests lead to rapid decline in the amount of rain. The issue of soil erosion and soil temperatures is also depended on forest cover. In light with this situation, the normal agricultural activities are obstructed. Tettey et al (2003) noted that alteration of soil moisture, fertility as well as the prevailing climatic conditions inhibits the survival of crops and animals. This phenomenon leads to a decline of the overall yield expected from the specific region.

A report by Salih (2009) has outlined that rapid increase in population leads to over utilisation of food reserves. This has led to the adoption of genetically modified (GM) species in order to enhance production. These species have ended up failing to withstand the prevailing climatic conditions in Africa thus reducing the agricultural output. On the other hand, increase in population has induced the importation of cheap food products from the international market so as to supplement the locally produced food products (Macaskill, 2009). The over importation of the foreign products have ended up creating unfair competition to the local products thus worsening agricultural activities.

6b) Land Ownership Challenges: Since the pre-colonial, colonial and postcolonial era, land ownership has remained a problem in Africa. Proper policy structures to guide land ownership and use has been lacking in Africa. This has been evident through the
mixed land tenure systems, thus failing to demonstrate a clear land tenure system (Aruleba and Ajayi, 2010). Communal land, public, and private land are all poorly distinguished. The issue of size of land under each of the different forms of land ownership has also been a serious problem. Nelson (2009) postulated that most of the African governments have no political will to bring change and improvement in the land ownership issue. This has been evident in the failure to pass legislation or amendments concerning land ownership as well as the lack of commitment in the issuance of title deeds.

The challenges in land ownership have created serious obstacles in the undertaking of agriculture. To begin with, the wrangles in land ownership have ended up discouraging foreigners from participating in agricultural activities in Africa. This is due to the high rates charged on land as well as the fear of being chased before end of contract. Sage (2010) depicted that poor planning on land ownership has been the main issue obstructing foreign firms from investing in agriculture in Africa. This has had a very negative effect in that it obstructs utilisation of the available agricultural land.

Poor land ownership structures have led to continuous wrangles and civil wars. This is evident in many African nations which have led many years of civil wars basically because of wrangles on land ownership (Tettey et al, 2003). Following the eruption of civil wars on land disputes, people end up killing one another. Many other people end up being refugees in their country. This phenomenon does not only cause destruction to human life but also obstruction to food production. This is so because the land is left idle after the owners are chased away following the clashes. In regard to this situation, agricultural operations are destructed thus leading to declines in production (Tettey et al, 2003).

6c) Other Social Threats to Food Security in Africa: The diversity of African culture and social orientation has been identified to have strong influence on agriculture. In this case, the different cultural groups have their own ways of life, which is closely tied to agricultural practices. Most of the African communities view agriculture as a way of living (Atehnkeng, 2007). In this case, people only engage in agriculture for the sake of sustaining life. In this phenomenon, the commercial aspect of agriculture is in absence
in the minds of many African societies. This situation has led to the dominance of subsistence farming in many social setups. With this form of philosophy and ideology, the African societies have failed to accept change and commercialise agriculture. Nkala et al (2011) observed that this traditional ideology of agriculture as a way of life rather than a source of better livelihood is the main obstacle to efficient agriculture. Salih (2009) also outlined that the traditional ideologies and practices undertaken by the African communities have obstructed them from adopting change. This makes people to gain pleasure in undertaking the very traditional means of producing food.

7. TECHNOLOGICAL THREATS TO FOOD SECURITY IN AFRICA

Despite the developments and advancements of technology in the 21st century, Africa still lags behind. Most of the sectors in Africa have not yet adequately adopted modern technology. This phenomenon has not been exempted in the agricultural sector, where a wide gap has been witnessed in the adoption of technology. This situation has been identified as a big challenge to food production in Africa. Research by Kumar et al (2009) has shown that most of the African nations are still relying on old technologies in agricultural production. This has led to inefficiencies as well as the low outputs from agriculture. Johnson et al (2000) indicated that the inadequacy in the adoption of technology in agriculture is a threat to agriculture in Africa thus the need for change.

7a) Inadequate Farming Technology and Equipments: Many of the Africa nations are suffering from a serious technological inadequacy in the agricultural sector. This has been evident through the inadequate farming technology adopted in most of the nations. To begin, the adoption of heavy machinery in cultivation has been missing. Despite that extensive commercial farming is still evident in different parts of the continent. The proper technology to make it efficient has not been adopted. A research by Liapis (2007) has shown that human labour and animal labour has been the main source of power for agriculture. This has been identified as the main cause of inefficiency in commercial agriculture in the continent (Dewbre and Brooks, 2006). Although Africa has a high number of unemployed people, the use of human labour in agriculture remains to be inefficient in terms of time and costs (Mandere et al, 2011). With this in mind, there is great need to adopt modern technology in farming so as to boost output.
The issue of technology in agriculture has also been witnessed in the use of exotic and GM species. Most of the African nations lack modern technology in the advancement of animal and plant breeds (Cooper, 2006). In this case, GM crops have not been adequately adopted in many nations. This has led to the reliance on traditional breeds which are not productive. Technology in research and development of agriculture has also been lacking. This has been closely associated with economical challenges (Stockbridge, 2007). Based on these phenomenons, new ideas in farming are locked out thus leading to reliance on the traditional technologies and forms of agriculture.

Technological inadequacy in farming has been greatly realized in the prevention of pests, insects and diseases affecting crops as well as livestock. Many farmers in Africa only rely on traditional ways of countering the effects of pests and diseases affecting their crops which has led to a high sense of inefficiency (Josling, 2003). In this case, manufactured pesticides, insecticides and other agrochemicals have not been adequately integrated in agriculture. As a result of this scenario, high damage on farm produce is witnessed leading to low produce. On the other hand, the technologies adopted in harvesting and storage of farm produce is also outdated. This in turn leads to massive damage and heavy losses (Johnson et al, 2000). This has been attributed to lack of modern equipments and resources for addressing the issue.

7b) **Fertilizer Supply Challenges:** The manufacture and supply of fertilizer is a great challenge. Most of the fertilizer being used by African farmers is imported from the developed nations (Bosede, 2010). Kumar et al (2009) indicated that the industrial backwardness of Africa has led to the unavailability of industries to produce fertilizer. This is also associated with technological challenges as well as economic challenges. Based on this scenario, the supply and accessibility of fertilizer is a serious calamity. The prices of fertilizer are inflated, thus making it unaffordable to a large percentage of farms. The high prices of fertilizers in Africa have also been a main cause of the high cost of doing agriculture in Africa. This makes agriculture unprofitable thus chasing out many potential investors (Liapis, 2007). The importation of fertilizer from the developed nations has also led to the dumping of inorganic fertilizers from the developed nations. This has led to the deterioration of soil thus reducing farm output.
7c) **Lack of Improved Seeds:** As depicted by Stockbridge (2007), food production in Africa has been threatened by the dominance and adoption of traditional crop and animal breeds. The issue of adopting improved seeds and hybrid livestock breeds has been neglected. Dewbre and Brooks (2006) postulated that, the use of local seeds and animal breeds has been the main cause of low agricultural produce in Africa. Most of the breeds adopted by many farmers yield low output thus challenging the dreams of attaining food security in Africa. With the presence of unfavourable climate in most parts of Africa, most of the seeds used have not been able to grow well thus declining produce. In this case, the use of genetically modified (GM) crops which have high tolerance of harsh weather has been neglected (Cooper, 2006). In order to counter the crisis, the African community should be empowered to focus on the adoption of improved seeds and more specifically the use of GM crops. This will definitely help in doubling agricultural output.

7d) **Soil Fertility:** As postulated by Professor Sir Frank Engledow (1947), the state of soil fertility in Africa has been devastating. Most of the sub-Saharan regions are rocky and sandy (Chuku and Okoye, 2009). This is unfavourable for the farming of crops as well as the domestication of animals. A research by Josling (2003) has shown that low agricultural yield received in many parts of Africa is due to the poor soils. Liapis (2007) indicated that concept of soil erosion has not be adequately addressed. In this case, soil erosion has led to loss of soil fertility in many parts of the continent. Some of the factors associated with the high levels of soil erosion in Africa include poor farming methods, deforestation and the sloppy terrains. It has been sad to note that most of the African governments have been reluctant in addressing the issue of soil erosion thus compromising soil fertility.

From another perspective, the desert conditions of most of the African regions have been a main cause of unfertile soils. This has been evident in the regions bordering the Namib Desert, Kalahari, and Sahara desert among other deserts in Africa. All this regions have very poor soils which can not support agriculture. It is worth noting that the high prices of fertilizers have also made it impossible for farmers to use fertilizers in their farms. As a result of this situation, the fertility of the soil is left to deteriorate (Bosede, 2010).
7e) **Other Technological Threats to Food Security in Africa:** As outlined by Josling (2003), the absence of technology in agriculture in Africa has been a serious threat to sustainable food production. The inadequacy of adopting technology in African agriculture has been witnessed in the processing and manufacture of food products. A high sense of inefficiency has been evident in the entire process of harvesting, transport, and processing of food products. Cooper (2006) depicted that modern facilities for handling perishable food products have not been adequately used in African agriculture. This has led to massive damage of perishable foods thus leading to great losses (Kumar et al, 2009). This is a great threat to agriculture in the sense that the operational costs are increased as well as decline of the overall output. Liapis (2007) indicated that the absence of technology in the processing and storage of food products is a main cause of the food shortage in the sense that food products that could have been stored during surplus are damaged.

8. **CONCLUSION**

In response to the problems identified in African agricultural sector as well as the rural economic backwardness, significant strategies need to be undertaken. The entire state of agriculture in Africa is pathetic, thus contributing to diversified problems including, food scarcity, variability in prices and food insecurity. As realized in the suggested reform section, the increased production of bio-fuels and the epidemic of climate change are the main challenges facing agriculture in the continent. On the other hand, the state of rural areas in Africa is unacceptable due to the low levels of economic development, poor infrastructure, high unemployment rates, and high poverty levels. In order to adequately curb these problems facing African agriculture and the rural communities, the following should be what the reform policies should strive to accomplish.

1. Establishment of efficient policies for guiding agricultural policies. This will entail the formulation of policies that ensure maximum government support on agriculture through provision of incentives and subsidies. It is the responsibility of the African governments to take the agricultural sector at heart and establish structures that ensure
efficient development in the agricultural sector. By so doing, the economic and financial problems facing the African farmers will be countered.

2. Adoption of better farming methods. It is of great importance for the African society to change their agricultural systems. As observed in the chapter, many African farmers are dependent on traditional farming methods like shift cultivation which has negatively impacted on the overall agricultural output. The reliance on rain fed agriculture has also been a main factor contributing to low food production in the continent. In response to this situation, irrigation farming should be prioritized. This will effectively supplement and complement rain fed agriculture thus ensure high food production. The use of traditional farming tools and methods like use of human labour and animal labour should be integrated with machinery. This will help in enhancing efficiency in the sector thus enhance high food production. The use of machinery enhances extensive commercial farming thus increase the overall acreage under agriculture.

3. Increase agricultural research and development. The chapter has identified that many African nations lack adequate facilities and programs concerning agricultural research. This has led to inefficiency in agriculture in the sense that poor selection of crops and animals for farming is realized, thus leading to poor output. With this in mind, sufficient research and development facilities concerning agriculture should be established. In this process, the governments ought to be in the forefront in supporting this strategy. The main objective of these research and development programs is to evaluate climatic change effects alongside other environmental phenomenon affecting agriculture. With this information, the best crops and animals suitable for different regions will be identified. This will help in boosting agricultural output in the continent, thus curbing the food crisis.

4. Expansion on the use of technology in farming. Technology is one of the best strategies for countering the immense effects of climate change as well as a potential strategy of ensuring increase in output. For instance, meteorological activities should
be boosted through government and private sector support. This will help in the provision of precise information to farmers thus enhance accurate planning. Use of technology in the meteorological department will help in monitoring of rain patterns, droughts, and winds among other elements of climate that affect agriculture. As a result, efficiency in agriculture and food production will be attained.

5. Adoption of improved seeds and animal breeds. With the emergence of technology, better and improved seeds and crop specifies have been realized. This is most evident through the phenomenon of genetically modified (GM) crops and animals. This species have been proved to yield overwhelming results as well as having capacity to withstand adverse climatic and environmental conditions. In this regard, GM crops and animals should be incorporated in agriculture.

6. Expansion of financial support to small and large scale farmers. The financial problems faced by farmers in Africa can only be countered through the provision of financial support. This can be achieved through provision of short-term and long-term agricultural loans. As a result of this, farmers will be in a position to purchase necessary farm machinery and other outputs. This will help in increasing agricultural output in the continent.

7. Provision of efficient and sustainable foreign trade policies concerning agricultural commodities. This will help in the protection of the local farmers from unfair competition from foreigners. Good trade and food polices will also ensure that agricultural products are not exported in periods of shortages. Through establishment of these policies, the local producers will be protected thus enhancing their morale to produce more.

8. Establishment of price controls on food commodities. Most of the prices of food commodities have been exaggerated even in cases of surplus production. Through price control, the menace of price variability will be to some extent countered.
REFERENCES


