Agriculture and food security in northern Ghana

Abstract

In the northern part of Ghana, about 97.9 percent of households are engaged in crop farming such as maize, rice, sorghum, soy beans, cowpea, cassava, yam, cotton and vegetables, with few households engaging in poultry, livestock and pig rearing. Agricultural production is therefore the main activity in the northern sector of Ghana and is practiced mainly on seasonal and subsistence level. Ghana's Gross Domestic Product has grown between 4 and 8 percent annually over the past decade, and agricultural growth has been the major driver of poverty reduction. The agriculture sector is the largest source of employment for the people of northern Ghana and Ghanaians in general, and is dominated by smallholder farmers. The challenges in the agriculture sector are in the dimensions of diversity in agro-ecology and constraints including human resource and managerial skills, natural resource management, technology development and food insecurity. Food security is a complex phenomenon resulting from multiple causes which are food availability, food accessibility, food utilization and food stability. About 5% of Ghana's population are food insecure and about 2 million people are vulnerable to become food insecure. Agricultural growth has been more rapid than growth in the non-agricultural sectors in recent years, expanding by an average annual rate of 5.5%, compared to 5.2% for the economy as a whole. However, agricultural growth heavily depends on rainfall patterns and land expansion. The objective of this paper was to review literature on food security in Ghana, agricultural contribution to food security in northern Ghana and some policy plans to reduce food insecurity in northern Ghana.

Key words: food security; agriculture; smallholder farmers; households; Ghana

Introduction

Ghana is considered as an agriculture-dependent nation, although mechanized agriculture is almost non-existent. The economy of Ghana is controlled by the agriculture sector, accounting for 23% of the national Gross Domestic Product (GDP) in 2012 (FAO and FAPDA, 2015). Since 2000, there has been a total of between 35.8% and 37% contribution to the GDP from agriculture.

Although agriculture is heavily dependent on rainfall, Ghana and most especially northern Ghana, has unpredictable and erratic rainfall pattern. In recent times, adoption of modern agricultural technologies and cultural practices such as irrigation, fertilizer application, use of resistant varieties, good planting and harvesting times, among others might be the panacea to increased agricultural production and improved food security and livelihoods among farmers in northern Ghana. However, the adoption of these modern practices is hindered by financial constraints as these farmers are smallholder farmers with limited financial support. Commercial banks, private partners and insurance companies are often not ready to support them adopt and apply these technologies. Challenges in the agriculture sector are not only limited to cultivation, there are serious concerns when it comes to postharvest storage and marketing. The major cause of food insecurity in northern Ghana is therefore, attributable to the use of bad farming practices and postharvest losses. The objective of this article was to review literature on food security in Ghana, agricultural contribution to food security in northern Ghana and some policy plans to reduce food insecurity in northern Ghana.

Definition, indicators and linkages of food security

There are many definitions of food security that highlight different components. Ghana's Ministry of Food and Agriculture (MoFA) operational definition of food security is "good quality nutritious food, hygienically packaged, attractively presented, available in sufficient quantities all year round and located at the right place at affordable prices. According to FAO (2013), Food security exists when: "All people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life". Achieving food security requires that the aggregate availability of physical supplies of food is sufficient, that households have adequate access to those food supplies through their own production, through the market or through other sources, and that the utilization of those food supplies is appropriate to meet the specific dietary needs of individuals. Food security is a complex phenomenon that exhibits itself in numerous physical conditions resulting from multiple causes.

Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (FAO, 2002). Within this definition of food security, there are three components: Availability, Access and Utilization.

Food availability refers to the quantity, quality and seasonality of the food supply in the affected area. It includes all local sources of food production including agriculture, livestock and fisheries as well as wild-collected foods. It also includes all foods imported into the area by traders. The presence of well-functioning market systems that is able to deliver food to the area on a consistent basis and in adequate quantity and quality is a major determinant of food availability. Food access refers to the capacity of a household to procure sufficient food to satisfy the nutritional needs of all its members. It is a measure of the household's ability to acquire available food during a given period through a combination of home production and stocks, purchases, barter, gifts, borrowing or food aid. Food utilisation refers to a household's use of the food to which it has access, including food storage, processing and preparation as well as its distribution within the household. It also refers to an individual's ability to absorb and metabolize nutrients, which can be affected by disease and malnutrition.

FAO (2014) also established four dimensions of food security: availability, access, stability and utilization. FAO (2014) indicated that one of the key determining factors of food security is the availability of food and its constituents. There could be availability of dietary energy but not diversified enough to provide the macro and micro nutrients essential for a healthy life. Information on food available for consumption is mainly obtained at an aggregate level through food balance sheets, which give data on the quantity of energy and protein available on each day per person at the national or household level. Dietary energy supply could be a good indicator of food availability, but other indicators, such as food adequacy, are needed to provide information on the gap between food supply and average energy requirements.

Hunger will continue to be an issue as long as the available food is not adequately distributed among the population. All people should have access to food physically and economically. Access to food is basically determined by incomes ability of households and individuals to access social support, and prices of food. Beyond economic affordability, physical access to food is enhanced by availability of infrastructure, such as railway lines and motorable roads. As regards roads, from the year 2005 and beyond, Ghana among other seven other nations had the highest road density (14 to 110 km per 100 square km of land area). Aggregate FAO projections show that, even with decreasing consumption, global agricultural production still needs to increase by 60% (and nearly 80% in developing countries) in the next four decades in order to cope with a 39% increase in population and increase global dietary energy supply beyond 3000 kcal per person per day. This translates into the additional production of almost

one billion tons of cereals annually by 2050. In 2009 Ghana, among eight other African nations, had the highest food supply of primary food crops, which ranged between 2730 and 3349 kcal/cap/day.

Food utilization is a measure of a population's ability to obtain sufficient nutritional intake and nutrition absorption during a given period (Hauck and Youkhana, 2008). Diversified poor meal is often associated with deficiency in micronutrient and it is a strong indicator for child stunting and maternal nutritional status (Ruel *et al*., 2010). Anaemia caused by iron deficiency is known to be very common among individuals with meals low in animal protein and high in rice or in whole wheat (Banerjee and Duflo, 2011). Progress in food access and availability is not always associated with progress in food usage. Food handling, preparation and storage influence food utilization.

Food stability refers to stability of availability, access, and usage at all times with no risks. The main risks which might have great effects on availability, access, and usage are extreme weather conditions, energy scarcity, economic and social disruption, and poor functioning global markets. Stability emphasizes on having mechanisms in place to ensure the availability, access, and usage which is likely to change with risks. To address such risks, production systems need to be promoted and supported, ensuring sustainable investment in rural development, and improving market governance. The common factors associated with the stability parameters are focused on the availability and access parameters. Over the past 50 years, the world's crop production has increased three times. Growth in crop production corresponds to increase in crop yields in the arable land on which crops are planted which together with increases in crop intensification, such as higher multiple cropping, or reducing fallow periods, can lead to an expansion in the harvested area (Pangaribowo *et al*., 2013).

Food security is perceived at four levels, namely, global, national, household and individual. These levels are linked from the higher global level through the national and household levels to the individual level. The linkages are sequential but not causal. The food security at global level does not guarantee the food security at the national level. The food security at the national level also does not guarantee food security at the household level; and finally, the food security at the household level does not guarantee food security at the individual level.

In other words, the food insecurity at a lower level is not necessarily caused by the food security situation at a higher level of the linkage. However, food security at a higher level can be an important factor in the food security at lower levels of the linkages.

The major food security issues differ at the respective levels. At the global level, the major food security issues are the aggregate production and availability at the international markets. It is often observed that while global food production is adequate, many developing countries face inadequate food supply. Their restrained access to the global food supply is caused by limitation of foreign exchange. At the national level, the major food security issues include the aggregate domestic production, and the capacity to import shortfalls. At the household level, the major food security issues are incomes, food and non-food prices (inflation), that impact on access to adequate quantities of the available food. In many instances, the net food supply is adequate at the national level, but many households still faced food security problems. At the individual level, the main food security issues are nutritional adequacy (calorie intake) and food safety. Adequate food may be available in a household but significant malnutrition may occur among some members, particularly, women and children.

Agriculture contribution to food security in northern Ghana

The agriculture makes direct and indirect contributions to food availability and accessibility. The direct contribution is by supplying all or part of the food commodities consumed annually. The agricultural sector also contributes to the foreign exchange earnings which give the country the capacity to import the shortfall in the domestic food production. The indirect contributions include the employment offered to the economically active population to earn incomes. The agricultural sector also influences food prices and contribute to inflation.

Crop and livestock production

The major food commodities produced include cereals (maize, rice, millet and sorghum), root and tuber crops (cassava, yam and sweet potatoes), vegetables (pepper, tomato, onions, okra, and garden eggs), pulses and nuts (shea nut, cashew nut, dawadawa and tamarine), fruits (mango), livestock (cattle, sheep, goats, pigs), poultry and fish. The cereals, root and tubers are the staple crops. Wheat products are consumed in large volumes but the agro-ecological conditions do not allow successful cultivation. There is a considerable fluctuation in the annual food production, besides being seasonal. The production of the staple crops suffered a severe decline from the 1970s and made inadequate recovery in the early 1980s, except millet

whose production increased during those periods (Nyanteng and Asuming-Brempong, 2003). The upward trend continued throughout the 1990s. The exception again was millet whose production declined steadily during the period. The most limiting in agriculture's contribution to food security is livestock and fish production. Meat, poultry and fish are generally a small part of a typical Ghanaian meal. The major sources of domestic meat supply are cattle, sheep, goats, pigs and poultry (Nyanteng and Asuming-Brempong, 2003). Other sources of meat are game (wildlife) which is fast depleting. The production of the major livestock and poultry has been upward since the 1970s except pigs whose production declined in the 1990s (Nyanteng and Asuming-Brempong, 2003).

Food exports

While several food types are imported annually, several other food commodities are also exported, particularly, since the mid-1980s (Nyanteng and Asuming-Brempong, 2003). For some food commodities, the country was a net importer, such as fish. The food export is promoted in order to expand the country's export base to earn increased foreign exchange. According to Nyanteng and Asuming-Brempong (2003), among the exported food commodities are yam, plantain, aubergine, chillies, pineapples, pawpaw, banana, and fish. The food exports have been criticized by local consumers on account of inadequate domestic supply and high prices that threaten their food security. Also blamed for the food exports is the poor quality of fresh foods in the domestic markets due to selection for export. In 1999 for example, the volume of maize exported formed 2.9% of total production; while yam, plantain and cocoyam were 0.4%, 0.03% and 0.01%, respectively (Nyanteng and Asuming-Brempong, 2003).

Food security situation in northern Ghana

In general, 41.2% of the economically active Ghanaians are engaged in agriculture nationwide (PHC, 2010). The PHC (2010) further reported that 72% of the economically active persons in northern Ghana are engaged in agriculture. A recent report prepared by MoFA (2015) discussed that about 5 percent of Ghana's population (1.2 million people) are food insecure; with 34% in the Upper West region, 15% in the Upper East region, and 10% in the Northern region (WFP, 2009) and that these three regions constitute the northern part of Ghana. About 2 million people are vulnerable to become food insecure nation-wide, which means any unexpected natural or man-made shock will greatly affect the pattern of their food consumption.

Food insecurity in areas that are subsistence-oriented is measured using months of inadequate household food provisioning. Months of inadequate household food provisioning has been defined as the time between stock depletion and the next harvest (Bilinsky and Swindale, 2007). Areas that are subsistence-oriented produce primarily for home consumption, and only a few amount of the produce are sold in the market. Quaye (2008) reported that most farmer households in northern parts of Ghana experience significant level of food insecurity lasting from 3 to 7 months, and that Upper East region has been the worst affected region because it experiences 6 months period of food shortage.

The disparity between the north and south of Ghana in terms of levels of food insecurity is largely due to Ghana's geography, characterized by marked climate, agro-ecological and economic differences. The south has two rainy seasons, while the north has only one rainy season. Due to climate change the northern Ghana is experiencing increasingly erratic rainfall resulting in intermittent droughts. The drought situation is exacerbated by widespread deforestation for charcoal and firewood, and this has a severe impact not only on local subsistence agriculture but also the country's food security. Since over 70 percent of households in northern Ghana rely on agricultural livelihoods, severely limited food production will result in chronic poverty, food insecurity and malnutrition.

Quaye (2008) reported that most farmer households in the three northern regions of Ghana experience significant degree of food insecurity with food insecure periods occurring between 3 to 7 months (Table 1). Upper East Region is the worst affected as it experiences the longest food shortage period of 6 months on the average. The Northern and Upper West regions experience an average of 5 months of food inadequacy.

Table1: Months of household food insecurity in Upper West, Upper East and Northern regions of Ghana

Crop	Upper West			Upper East			Northern		
	Months of harvest	Months of stock	Months of food	Months of	Months of stock	Months of food	Months of harvest	Months of stock	Months of food

		depletion	insecurity	harvest	depletion	insecurity		depletion	insecurity
Sorghum	October	June	4	August	February	6	November	June	5
Maize	October	June	5	October	April	6	September	June	3
Millet	September	April	5	July/Nov	January	6	November	June	5
Rice	October	June	5	Nov	April	7	October	May	5
Yam	October	May	6	N/A	N/A	N/A	September	June	4
Groundnut	N/A	N/A	N/A	October	April	6	September	April	5
Cowpea	October	June	5	October	March	7	October	May	5
Soybean	September	April	5	N/A	N/A	N/A	November	April	7

Source: Quaye (2008)

Strategic plans to reduce food insecurity in northern Ghana

To reduce food and nutrition insecurity in the three regions of northern Ghana, Ghana's Ministry of Food and Agriculture outlined the following in 2012 (MoFA, 2012):

- ✓ Modernizing agriculture by improving productivity, mechanization, irrigation and water management.
- ✓ Maintaining national strategic stocks such as food storage, distribution and improved nutrition.
- ✓ Preventing and managing of emergencies and expanding national strategic stocks through effective early warning systems.
- ✓ Enhancing peoples' knowledge of the importance of optimum nutrition by improving advocacy on nutrition education and food fortification.
- ✓ Reducing post-harvest losses, and improving storage and distribution systems through capacity building of relevant stakeholders. This includes proper methods for harvesting, primary processing, grading, storing, and ensuring good linkages between producers and markets.
- ✓ Ensuring food production systems (macro and micro nutrients and food fortification) as an essential aspect of food processing.
- ✓ Reducing risks resulting from natural disasters and disease/pests outbreaks and ensuring adequate food stocks availability.

Conclusion

The growth in agriculture has resulted in reduction in poverty, and the agricultural sector which is dominated by smallholder farmers has the largest employees in northern Ghana in particular and the country at large. Although the agricultural sector is faced with some

challenges, these challenges are surmountable and the Ministry of Food and Agriculture has put in place urgent measures to address these challenges. Implementation of strategic plans to curtail food insecurity in northern Ghana is impressively underway to help manage the food insecurity situation. Ghana has made progress towards the international hunger targets, and was committed in reducing to half the number of hungry people by 2015.

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