**PERCEIVED EFFECT OF DRY SEASON FARMING ON HOUSEHOLD FOOD SECURITY IN GORGONIO LOCAL GOVERNMENT AREA OF SOKOTO STATE**

***ABSTRACT***

*This study assessed the perceived effect of dry season farming on household food security of farmers in Goronyo Local Government Area (LGA) of Sokoto State. A sample of 100 farmers was used. Data were obtained with the use of an interview schedule. Descriptive (frequencies and percentages) and inferential (Chi-square analysis) statistics were used to analyze the data. Findings indicated that the entire farmers were male; the majority of whom were in their economically active age group of fewer than 50 years, married (73.0%), with no formal education (83.0%). Farming was their major occupation (94.0%), to which they devoted 1-5 hectares (91.0%) of their personal land (69.0%) for dry season farming. They cultivated mainly rice (76.0%) during the season and perceived that they were food secured (85.0%). They reported that dry season farming improved their standard of living, served as a source of income and lowered their food insecurity level. Other benefits of dry season farming to the farmers were the source of food and employment. Result of the Chi-square analysis indicated that there was a significant difference between education of the farmers and their perceived food security level It was concluded that dry season farmers in Goronyo LGA of Sokoto State believed that dry season farming had a positive effect on their household food security.*

**Keywords:** Farming, dry season, food security,

## INTRODUCTION

Food is the need of human beings for survival, health and productivity. It is the foundation for human and economic development (Lisa *et al*., 2006). In a broad sense, food security exists when "all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences to living an active and healthy life" (FAO, 2001). On the other hand, food insecurity occurs when food systems are stressed such that food is not available, accessible or utilized properly.

Household food security has become a national and international concern in recent years which has been connected with the food crisis been experienced in the world. Food security is a flexible concept as reflected in many attempts at definition in research and policy usage (Clay, 2002). The concept of food security has been in use for the last thirty years to reflect changes in official policy thinking (Clay, 2002; Heidhues *et al*., 2004). According to Maxwell and Smith (1992), the term first originated in the mid-1970s when World Food Conference (1974) defined food security in terms of food supply – assuring the availability

and price stability of basic foodstuffs at the international and national level: "Availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production prices."

Sub-Saharan Africa and South Asia are the regions most affected by food insecurity, being home to 60% of the world's food insecure people. In the case of Sub-Saharan Africa, the food situation is further aggravated by low per capita food availability, high fluctuations in food supply and lack of innovative ideas as well as responsive policies for sustainable use and management of natural resources. The predominance of rain-fed agriculture often results in food systems that are highly sensitive to rainfall variability (Cooper *et al*., 2008). The region thus remains susceptible to frequent food crises and famines. Sub-Saharan Africa is the only region of the world where hunger is projected to worsen over the next two decades unless drastic measures are taken to improve governance of its natural resources and achieve the economic development required to reverse the current trends (FAO, 2006).

Despite agricultural policies and strategies in Nigeria, food insecurity remains a fundamental challenge in the country (Hall, 2002). Although agriculture remains a very component of the country's economy, contributing about 41% of GDP and employing about 70% of the active population, it receives less than 10% of the annual budgetary allocations. As a result, the agricultural sector has failed to supply sufficient food in quantity and quality to feed the constantly growing population. Therefore, the level of food insecurity in Nigeria has continued to increase steadily since the 1980s. Food insecurity rose from about 18% in 1986 to about 41% in 2004 (Sanusi *et al*., 2006). With an estimated population of 150 million, this implies that over 61 million Nigerians are food insecure, i.e are either hungry, undernourished or starving. This is not surprising given that about 52% of the population live under the poverty line.

Dry season farming through irrigation; has been described as the application of water to soil to make available essential moisture for plant growth. It also serves as insurance against drought and to provide a cooling effect on the soil environment for plant growth and development. Rosegrant *et al.* (2002) reported that irrigation has been a key to achieving food security in many parts of the world and that about 250 million hectares are irrigated worldwide today. It has been possible to increase and protect the harvest and grow crops that could otherwise be cultivated under the condition of extreme drought. Furthermore, irrigation has made higher and more reliable yield possible (Worlf, 1995). Sokoto-Rima River Basin Development Authority (SRRBDA) (1984) has observed that crops can be planted more than once in the tropics in a year, apart from the bigger and reliable yield as against yearly cultivation, which is often at the mercy of seasonal rainfall.

In spite of the importance of food to humans, the dry land sector of Sudan is characterized by the traditional farming system and rainfall fluctuations assemble with difficult management of crops cultivation. Thus, the majority of farm households is facing a problem of food deficit due to low access to food and lack of income earning from agriculture and related activities. Coping strategy and daily caloric intake of farmers household are used to determine the level of their food security which is subject to bias, thus determining the perceived level of food security becomes imperative. This study was therefore conducted with the main objective of assessing the perceived effects of dry season farming on household food security in Goronyo Local Government Area (LGA) of Sokoto State. It specifically described the demographic characteristics of the farmers, determined the major crops produced by the farmers, determined the perceived food security of the farmers and examine the farmers' perceived benefits of dry season farming in the area.

**METHODOLOGY**

This study was conducted in Goronyo LGA of Sokoto State. Located between latitude $11^{o}$ 00' and $14^{o}$ 00' N and longitude $3^{o}$ 50' and $8^{o}$ 00' E, it has an area of 1,705km$^{2}$ and a population of 182,296 (NPC, 2006). The LGA has a long history of intensive irrigation farming and commerce. The major industries are a craft, bridle bags and leather cushions cottage industries. There is also a long distance trading involving goods such as kola nuts, dates, salt, cloth, leather, rice, onion, garlic, pepper and spices, fishes and so on (Odjugo, 2010).

In general, there is a prominent seasonal variation in temperature and diurnal range of temperature. The daily minimum temperature is about 36$^{o}$C. During the harmattan season, the daily minimum temperature falls below 17$^{o}$C. Between February to April the highest peak of temperature recorded 44$^{o}$C. Average annual rainfall is about 740mm. Rainfall of the area is also highly seasonal and controlled by the movement of the Inter-tropical Discontinuity (ITD). Most rainfall is experienced during the relatively short but intense localized thunderstorm covering small areas (Odjugo, 2010).

Multistage sampling technique was used for sampling. Initially, two districts were selected purposively, leading in the population of dry season farmers, being located around the Goronyo dam. Then, five (5) villages were purposively selected having the highest population of dry season farmers, situated close to the dam, where dry season farming is carried out. They include Keta, Falalia, Gorau, Takakumi and Rimawa. Finally, 20 farmers were selected from the 5 villages using simple random sampling, which gave a total of 100 farmers. Data were obtained from the farmers with the aid of an interview schedule. The data were analyzed using frequencies, percentages and Chi-square analysis.

## RESULT AND DISCUSSION

### Demographic Characteristics of the Farmers

Table 1 shows that 46.0% of the farmers were less than 30 years, 44.0% were within the range of 30 – 49 and only 10.0% were 50 years and above. Therefore the majority of the

farmers were less than 50 years old. This shows that the farmers were within their productive ages.

The entire farmers (100.0%) were male, indicating the predominance of males in farming activities in the area (Table 1). It can also be attributed to the cultural and religious belief of the people in the study area, which prohibits women to go out freely and engage in certain activities such as farming. This finding is in line with the finding of Abdullahi *et al*. (2009) which revealed that most household heads were male.

The majority (73.0%) of the farmers were married. Only 27.0% were single (Table 1). This implies that majority of the farmers is married with family responsibilities. Such responsibility is expected to influence their involvement in dry season farming so that they can attain an adequate level of food security.

Table 1 also shows that majority (58.0%) of the farmers had a family size of 1 – 9 individuals, 32.0% of them had 10 – 18 member, while 10.0% had within 19 – 27 members in their families. Large family size often has an advantage in the provision of farm labour and it also saves the farmer a lot in employing labourers. Furthermore, family size serves as a source of prestige in some social settings. However, family size can be a source of pressure for the farmers to look for other alternatives of producing more food crops for the house, hence engaging in dry season farming.

The majority (83.0%) of the farmers had no formal education. They had Islamic education as their highest educational attainment, 13.0% of them had primary education, 3.0% had secondary education and only 1.0% had tertiary education (Table 1). Education is expected to have a positive influence on the farmers' perception of their food security level.

Table 1 shows that the majority (94.0%) of the farmers had farming as their major occupation, 3.0% of them were traders, while 2.0% and 1.0% were students and civil servants

respectively. It indicated that the majority of farmers spent more hours of their working time on the farm and rely basically on farming for livelihood.

**Table 1: Distribution of the Farmers according to their Demographic Characteristics**

| | Frequency | Percentage (%) |
|---|---|---|
| **Age (years)** | | |
| < 30 | 46 | 46.0 |
| 30 – 49 | 44 | 44.0 |
| 50 – 69 | 10 | 10.0 |
| **Sex** | | |
| Male | 100 | 100.0 |
| Female | 0 | 0.0 |
| **Marital status** | | |
| Married | 73 | 73.0 |
| Single | 27 | 27.0 |
| **Household size** | | |
| 1 – 9 | 58 | 58.0 |
| 10 – 18 | 32 | 32.0 |
| 19 – 27 | 10 | 10.0 |
| **Highest Educational attainment** | | |
| Non-formal education | 83 | 83.0 |
| Primary education | 13 | 13.0 |
| Secondary education | 3 | 3.0 |
| Tertiary education | 1 | 1.0 |
| **Major occupation** | | |
| Farming | 94 | 94.0 |
| Trading | 3 | 3.0 |
| Student | 2 | 2.0 |
| Civil servant | 1 | 1.0 |

Source: Field survey, 2014

## Major Crops Produced

Table 2 shows that the majority (76.0%) of the farmers cultivated rice, 13.0% cultivated pepper, while 9% and 2% cultivated tomatoes and onions, respectively. The result revealed that rice is the major crop cultivated by the farmers under dry season farming. In a study report for rice production in Nigeria, Ecosystems Development Organization (EDO) (2003) revealed that the dominant rice systems found in Nigeria are rain-fed field rice, also known as the dry upland system and waterlogged shallow *fadama* field rice system. The rain-fed field rice system is very widespread. It is particularly important in the Savannah zones. The

waterlogged shallow *fadama* system is also widespread. It is an important system given the fact that it is practised along with the major drainage systems such as the Niger/Benue troughs as well as minor watercourses and tributaries.

**Table 2: Distribution of the Farmers Based on Major Crops Produced**

| | Frequency | Percentage (%) |
|---|---|---|
| **Major crops produced** | | |
| Rice | 76 | 76.0 |
| Pepper | 13 | 13.0 |
| Tomatoes | 9 | 9.0 |
| Onion | 2 | 2.0 |
| **Total** | **100** | **100.0** |

Source: Field survey, 2014

## Food Security

The majority (85.0%) of the farmers perceived that they were food secured, while only 15.0% perceived themselves as being food insecure (Table 3). This indicates that the farmers had access to enough food.

On their perceived level of food security, 48.8% of the farmers were food secured at times, 45.0% were secured sometimes and 7.0% insecure at all times (Table 3). This indicates that although the farmers felt that they were food secured, the majority of them were not food secured at all times. There is, therefore, need for the farmers to boost their production level for the increased level of food security.

On their food security status, 41.0% the farmers considered themselves food secured for a few months, 32.0% for more than a year and 24.0% for a year (Table 3). Majority of the farmers, therefore, were not food secured throughout the year.

**Table 3: Distribution of the Farmers Based on Food Security**

| | Frequency | Percentage (%) |
|---|---|---|
| **Perceived Food Security** | | |
| Food secured | 85 | 85.0 |

| | | |
|---|---|---|
| Food insecure | 15 | 15.0 |
| **Perceived Level of Food Security** | | |
| At all times | 48 | 48.0 |
| Sometimes | 45 | 45.0 |
| Not at all | 7 | 7.0 |
| **Food Security Status** | | |
| For a few months | 41 | 41.0 |
| For a more than a year | 32 | 32.0 |
| For a year | 24 | 24.0 |
| For a month | 2 | 2.0 |
| For a week | 1 | 1.0 |

Source: Field survey, 2014

**Perceived Benefits of Dry Season Farming**

Among the benefits of dry season farming as perceived by the farmers, improvement in their standard of living was ranked first having a mean score of 4.26 (Table 4). It indicates that dry season farming improved their level of wealth, comfort, material goods and necessities. Increase in income level was ranked second with a mean score of 3.84. Lowering of food insecurity level had a mean score of 3.65 and was ranked third. This finding is in line with the finding of Akinbile *et al*. (2006) that irrigation farming boosts crop production thereby leading to higher income level and thus improves the farmers' standard of living. Yahaya (2002) also reported that dry season farming on *fadama* land has the twin advantage of crop diversification such that if a crop fails or are damaged, another crop will ensure food security and economic returns as dry season crops allow the farmers improve household economic security and investment on one hand and money to buy food in case of crop failure on the other hand. This will boost the economic fortunes of farmers and alleviate their problem in the event of adverse conditions or disasters. Sanchez *et al.*, (2005) also observed that the role of agriculture in income generation for the poor, particularly women, is more important for food security than its role in food production.

**Table 4: Distribution of the Farmers Based on Perceived Benefits of Dry Season Farming**

| | Total score | Mean score | Rank |
|---|---|---|---|
| **Benefits** | | | |
| Improve the standard of living | 426 | 4.26 | 1st |

| | | | |
|---|---|---|---|
| Source of income | 384 | 3.84 | 2nd |
| Lowers food insecurity level | 365 | 3.65 | 3rd |
| Source of food | 347 | 3.47 | 4th |
| Source of employment | 236 | 2.36 | 5th |

Source: Field survey, 2014

**Test of Relationship between the Demographic Characteristics of the Farmers and their Perceived Level of Food Security**

The chi-square analysis shows that there was no significant relationship between the age of farmers and the perceived level of food security of the farmers. There was also no significant relationship between marital status of farmers and their perceived level of food security. Household size of farmers had no significant relationship with their perceived level of food security. Land size of farmers also had no significant relationship with their perceived level of food security and their perceived level of food security (Table 5).

However, there was a significant relationship between the educational attainment of the farmers and their perceived level of food security ($x^2$ = 0.003 < P-value = 47.69) (Table 5). This implies that the educational level of a farmer has a great influence on their food security. This is contrary to the findings of Babatunde *et al.* (2007) that total household's income, quality of food from own production, educational status of household head and household size were significant in explaining the variation in the food security status of households in Kwara State. Goni (2006) also reported the factors that influenced household food security in the Lake Chad area as household size, stock of home-produced food, and numbers of income earners in the household. Shuaibu (2010), in her study of the role of Fadama II project on the household food security of rural women in Kaduna State, revealed that age, household size, and marital status were the factors that affected participants' food security while credit and access to consumption credit affected the food security of non-participants.

**Table 5: Test of Relationship between Demographic Characteristics of the Farmers and their Perceived Level of Food Security**

| Variable | $x^2$ value | Df | p-value | Decision |
|---|---|---|---|---|
| Age and perceived level of food security | 0.590 | 8 | 1.93 | Ho accepted |

| | | | | |
|---|---|---|---|---|
| Marital status and perceived level of food security | 0.172 | 6 | 9.02 | Ho accepted |
| Household size and perceived level of food security | 0.826 | 2 | 1.17 | Ho accepted |
| Total land size and perceived level of food security | 0.194 | 4 | 62.75 | Ho accepted |
| Educational attainment and perceived level of food security | 0.003 | 4 | 47.69** | Ho rejected |

** Significant at 1%
$x^2$ = Chi-square calculated value
Df = Degree of freedom

## CONCLUSION

Dry season farmers in Goronyo LGA of Sokoto State believed that dry season farming had a positive effect on their household food security. Producing mainly rice, the farmers felt food secured albeit within a short time, in addition to other benefits of the dry season farming. However, the perceived level of food security was mainly controlled by the educational attainment of the farmers.

## RECOMMENDATIONS

Based on the finding of this study, it is recommended that:

i. Farm inputs like fertilizers and chemicals should be made available to the farmers at subsidized rates by government and non-governmental organizations interested in improving food security through agriculture.

ii. Loans should be granted to the farmers at a very low-interest rate.

iii. Infrastructure such as road should be constructed to create linkage to the market.

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