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SOCIO-ECONOMIC ANALYSIS OF FOOD SECURITY STATUS OF SMALLHOLDER FARMERS IN LAND DEGRADATION PRONE COMMUNITIES OF JIGAWA STATE NIGERIA

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ABSTRACT

The study examines the Socio-economic effect of land degradation on food security among smallholder farmers in some selected LGAs Jigawa state, Nigeria. Twelve communities, 3 each from the 4 local governments selected from each of the 4 agricultural zones of the state were selected. Six of the communities were desert prone and the other six were water prone communities. About 335 smallholder farmers were selected using multistage sampling procedure and data collection was conducted using structured questionnaire and Focus group discussion. Data were analyzed using simple descriptive statistics, food security index and multiple regression model. The results showed that 88% of the smallholder farmers were food insecured,85% feed twice a day,70% doesn't eats to satisfaction52% produced food that last for <= 6 months and 98% doesn't access food at affordable prices. Regression coefficient of household size, age of household head, level of education, membership of farmer group, contact with development agent and size of farmland under cultivation were all negative. How ever, regression coefficient in relation to household size (P>0.000),age of household head (P> 0.000),level of education (P> 0.010) and contact with development agent (P>0.041) were positive while size of farmland under cultivation (P>0.794) and membership of farmer group (P>0.169) were negative. It shows that majority of the respondents are food insecure and socioeconomics plays a positive role in the food security status. Rural urban migration was identified as one of the major coping strategies adopted against food insecurity in the study area. It is recommended that development agencies in collaboration with government should support the communities' efforts on reversing the effect of land degradation prevalent in the study area and this is in turn expected to help in reducing the effect of food insecurity in the study area.

INTRODUCTION

As rising populations and incomes increase pressure on land and other resources around the world, agricultural productivity plays an increasingly important role in improving food supplies and food security (Wiebe, 2003).Like in most parts of the world, land degradation results at decline in soil fertility, low return to agricultural investment, decreased food security and general high food prices consequently threatening food security (Odera *et al*., 2000).Due to the presence of land degradation, Africa as a whole has become a net food importer since the mid-1980s. However, the economic implications of land degradation are particularly severe in Sub-Saharan Africa because 65% of the population is rural and the main livelihood of about 90% of the population is agriculture (Stringer and Reed, 2007).Soil fertility decline as a results of land degradation remains

major cause for decline in per capita food availability among Smallholder farmers of sub-Saharan Africa. The failure to match food supply and demand is therefore, attributed to soil nutrient depletion following intensification of land use without proper management practices and inadequate external inputs (Sanchez and Jama, 2002).

Nigeria, a West African country located in the tropical zone of the world has a land area of about 923,769 km2 withtheNorthernregioncoveringabout79% of the entire land mass (FOS, 1989; Salako , 2003; Aregheore , 2005). The country comprises about five broad ecological zones: Swamp forest, Tropical rainforest, Guinea Savannah, Sudan Savannah and Sahel (Okpara et al., 2013). Of the five zones, Northern region is made up of three: Guinea Savannah, Sudan Savannah and the Sahel. Northern Nigeria is composed of 19 of the country's 36 states. It is inhabited by over 50% of the country's 167 million people (Pate and Dauda, 2013) sparsely distributed across 79% of the country's total land mass. As a result of the socio-economic structure of the region, most families practice subsistent farming and/or nomadic, pastoralism for economic sustenance. Northern Nigeria (as one advances north-ward) is characterized by low rainfall and drought-like conditions (Xue and Shukla, 1993). Land degradation in form of desert encroachment due to unpredictable and extreme weather associated with climate change reduces the productivity of rural farmers by drastically reducing the available cultivable land. Farmers in northern Nigeria are facing accelerated desertification due to limited rains and shrinking water sources which further translates into continues reduction in productivity of the land (Onuoha, 2008). Small scale, resource poor farmers in Nigeria, the majority of whom are engaged in subsistence or near subsistence farming, produce the majority of aggregate agricultural noutput via rudimentary farming systems (Oviasogie, 2005: Ajibolade, 2005). Farm holdings across Nigeria are generally small with less than 5 hectares on average and are often inherited rather than purchased (Adeyemo and Akinola , 2010; Oladeebo, 2006; Adewuyi, 2002; Egwuda, 2001; Ekunwe and Emokaro, 2008; Adejoh, 2009; eOviasogie, 2005; Yaro, 1999).This Papers analyses the relation ship between socioeconomic characteristics of smallholder farmers and their food security status in a land degradation prone communities of Jigawa state of Nigeria.

1) describe socio-economic characteristics of the smallholder farmers,
2) determine the food security status of the smallholder farmers,
3) determine the relationships between food security status and socioeconomic characteristics of the smallholder famers,
4) describe the coping strategies adopted by smallholder farmers against food insecurity

DEFINITION OF TERMS

Food security is a flexible concept as reflected in the many attempts at definition in research and policy usage. Even a decade ago, there were about 200 definitions in published writings.Food security as a concept originated only in the mid-1970s, in the discussions of international food problems at a time of global food crisis. The initial focus of attention was primarily on food supply problems - of assuring the availability and to some degree the price stability of basic foodstuffs at the international and national level.

Socioeconomics (also known as social economics) is the social science that studies how economic activity affects and is shaped by social processes. In general, it analyzes how societies progress, stagnate, or regress because of their local or regional economy, or the global economy (John *etal.*, 1989). Socioeconomic status (SES) is an economic and sociological combined total measure of a person's work experience and of an individual's or family's economic and social position in relation to others, based on income, education, and occupation NCES, (2008)

Food insecurity— "Limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways.**Food insecurity** exists when people do not have adequate physical, social or economic access to food as defined above.

Land degradation:land degradation can be defined as a natural process or a human activity that causes the land to be unable to provide intended services for an extended time (FAO, 2004) or temporary and/or permanent lowering of the productive capacity of land that can take place in the form of deforestation, change in water quality and quantity, and soil degradation (Sil *etal*., 2014)

METHODOLOGY AND STUDY AREA

The study was conducted in Jigawa State of Nigeria. Jigawa State is one of thirty-six states that constitute Federal Republic of Nigeria. It is situated in the north-western part of the country between latitudes 11.00°N to 13.00°N and longitudes 8.00°E to 10.15°E. Kano State and Katsina State border Jigawa to the west, Bauchi State to the east and Yobe State to the northeast.The state has a total land area of approximately 22,410 square kilometres. Its topography is characterized by undulating land, with sand dunes of various sizes spanning several kilometers in parts of the State. The southern part of Jigawa comprises the Basement Complex while the northeast is made up of sedimentary rocks of the Chad Formation. The main rivers are Hadejia, Kafin Hausa and Iggi Rivers with a number of tributaries feeding extensive marshlands in north-eastern part of the State. Hadejia – Kafin Hausa River traverses the State from west to east through the Hadejia-Nguru wetlands and empties into the Lake Chad Basin. Most part of Jigawa state lie within the Sudan savannah vegetation zone with elements of guinea savannah in the southern part. The State is currently made up of 27 local government areas and is agriculturally classified into four (4) zones by Jigawa State Agricultural and Rural Development Authority (JARDA). The zones are as follow: -

Zone 1*: Birnin Kudu, Gwaram, Buji, Jahun, Kiyawa, Dutse and Miga LGAs*
Zone 2*: Gumel, Maigatari, Garki, Ringim, Taura and and Gagarawa LGAs*
Zone 3:*Hadejia, Guri, Malam Madori, Auyo, Kiri kasama, Kafin Hausa, and Kaugama LGAs*
Zone 4*: Kazaure, Yankwashi , Roni, Babura, Sule tankarkar, and Gwiwa LGAs*

(JARDA, 2006) Ground survey data from the Jigawa State Agricultural and Rural Development Authority (JARDA) indicates that Jigawa State has a total fadama (wetlands) size of 3,433.79 km which represent about 14% of its total landmass. The state's economy is largely characterized by informal sector activities with agriculture as the major economic activity. Over 80% of households in the state derive their income from farming, including animal husbandry.The severity of poverty in Jigawa state is at 24.6% (Ojowu *et al.*, 2007). It is estimated that about 1. million hectares (out of the state's 2.4 million hectares of landmass

can be cultivated during the rain-fed season, while about 308,000 hectares is cultivatable during the dr season through irrigation.Jigawa State is one of the dryland areas in Northern Nigeria faced with Lan degradation problems. The rate of desert encroachment in Jigawa state was estimated at 0.2Km/annum. Th state is also faced with indiscriminate failing of trees for use as source of energy (Aliyu *et al*., 2013).

SAMPLING PROCEDURE

A multi stage random sampling techniques was used in this study to draw a representative sample o farmers. The first stage involves purposive selection of one (1) Local Government Area (LGA) from eac of the four agricultural zones of the State. Second Stage involves purposive selection of three (3) village from each of the selected local government Areas based on the degree of vulnerability, which gave a tota of twelve (12) villages. Villages were selected with the assistance of the Monitoring and Evaluation unit o Jigawa State Agricultural and Rural Development Authority (JARDA). The final stage involved listing o farmers in the villages. Sample frame comprising of 2600 farmers across the twelve villages was develope base on information obtained from JARDA. Raosoft sample size formula was used to determine th appropriate sample size to be covered at 95% confidence level and 5% error margin.

x = Z(c/100)2r(100-r)

n = N x/((N-1)E2 + x)

E = Sqrt[(N – n)x/n(N-1)]

where N is the population size, r is the fraction of responses that you are interested in, and Z(c/100) is th critical value for the confidence level c Raosoft , (2004)Thus, a total of 335 samples were randoml selected from the list of 2600 farmers (as found using Raosoft formula). The samples were distribute proportionally across the twelve selected communities taking 12.88% of the population of each communit to arrived at 335 sample. A total of 315 questionnaires were returned for analysis.

Table1: Summary of sample size and location of the farmers

Local Government Area	**Villages Selected**	**Sample Frame(a)**	**Sample (b= 12.88% of a)**
Maigatari	Motaya	231	30
	Galadi	198	25
	Maigatari	329	42
Kazaure	Dabaza	185	24
	Kaina	198	25
	Katsinawa	231	30
Guri	Dolen Zugo	264	34
	Guri	231	30
	Aji Bukaram	165	21
Miga	Miga	198	25
	Galauchime	185	24
	Sansani	188	34
Total	**12**	2600	**335**

METHOD OF DATA COLLECTION

Structured questionnaire, was used to generate primary data, Key informant interview and Focus Group discussion. Major data collected include socioeconomic characteristics of the respondents such as sex, age, years of farming experience , Contact with development agent, level of education, household size , major occupation and primary occupation .Pattern of food consumption ,food production ,food availability and sources food calorie for the house hold were also sourced. In order to establish extent of land degradation; farmers observations on desertification wind or water erosion, invasion of strange weed, depletion of soil nutrients, uneven growth of crop ,change in soil colour ,water logging ,deposition of chemicals/salt etc were also recorded during the study. The focus group discussion (FGD) involved groups of Farmers who actively involved in both rainy season and dry season farming in the study areas. A total of 12 farmers from each of the targeted community had been selected through purposive sampling.

Data Analysis

Descriptive and inferential statistics were used for data analysis.

Descriptive Statistics was used to achieve objectives 1, and 7. Regression Analysis was used to achieve objectives 4, 5 ,6 and Part of 3 while, Food security index was used to achieve part of objective 3.

Food Security index

Food security index was used to assess food security status of the household. The Seven-day recall metho was used based Per capita calorie intake was calculated by dividing the estimated total calorie intake by th family size after adjusting for adult equivalent using the consumption factors for age-sex categories. Th house hold s daily per capita calorie intake was obtained by dividing the households' calorie intake b seven. A house hold whose daily per capita calorie intake is up to 2900 Kcal was regarded as food secure and those below were regarded as food insecure.

Model specification:

Zi = Yi/R..... (v)

Where:

Zi = Food security status of ith households which take value 1 for food secured households or 0 for food insecure households,

Yi = daily per capita calorie intake of ith house hold,

R = recommended per capita daily calorie intake (2900Kcal),

Zi = 1 for Yi greater than or equal to R,

Zi = 0 for Yi less than R

The dependent variable and the explanatory variables included in the model are:

Z = the food security status of ith house hold

Ld = Extent of land degradation (See model i)

X_1 = Household size (number household members)

X_2 = Farm size (Ha)

X_3 = Membership of farmers group

X_4 = Contact with development agent

X_5 = Age of household head (Years)
X_6 = Educational status of household head
X_7 = Years of farming Experience

Food security: **House hold income(X_1)**: This refers to the sum total of the earnings of the house hold in year from farm and off farm sources. The income is expected to boost household's food production an also access to more quantity and quality food. The expected effect of this variable on food security i positive.

Farm size (X_2): Farm size is the total farmland cultivated by the house holds measured in hectors. Th larger the farms size the higher the production level. It is thus expected that house hold with large households farm size would be more food secured than those with smaller farm size. Expected effect o food security is positive.

Membership of Farmers group (X_3): Cooperatives are vehicle for development in the rural areas. Acces to cooperative loans depends on membership of the society and it is expected that access to loan shoul increase the house hold income, food production and food consumption. The expected effect on foo security is positive. .

Age of house hold head (X_6): The age of house hold head in year is expected to have impact on hi Labour supply for food production. It is also expected to have impact on the ability to seek and obtain of farm jobs and income, which could increase house hold income. Young people are stronger and expected t cultivate larger size farm than old people. However, the expected effect of age on food security could b positive or negative.

Educational status of house hold head (X_7): The education is a social capital, which could impac positively on house hold ability to take good and well informed production and nutritional decisions. Som scholars have argued that spouse education could have more important on food security than household head educational status. Households that are educated =1 and not educated =0, the expected effect on foo security is positive.

House hold size (X_8): The number of adult individual members in the house holds measures house hol size. Since food requirement increase with the number of persons in a house hold, the expected effect i negative

RESULT AND DISCUSSION

Manifestation of land degradation

Soil erosion, salinity and an absence of vegetative cover are early-warning signs of land degradation in dry land areas (otherwise known as desertification) (Hamidov *et al.*, 2016). The farmers interviewed reported number of signs they observed on their farmlands (Table 2).

Table 2: Sign of Land Degradation Reported by Smallholder Farmers

Sign of Land Degradation	Freq.*	%	Rank
Un even growth of crops	304	97	1st
Destruction of Soil Structure	304	97	1st
Continuous reduction in Yield	304	97	1st
Deposition of Salt/chemicals	96	29	5st
Depletion of Soil Nutrients	304	97	1st
Desertification	210	67	2nd
Frequent Water logging	**98**	**31**	**4th**

Multiple Response *

Table 2 Presents that majority of the respondents observes the manifestations of land degradation in almost all the signs examined. Large majority (97%) of the smallholder farmers reported to have observed the manifestations of land degradation in form of uneven growth of crops. This may be accounted for as wind and water erosion were found to be prevalent in both the desert prone and the wetland areas of the study. The agent of erosion wash away the nutrients from a piece of land depending on the intensity and direction of the agent, which may lead to uneven distribution of nutrients in the soil thereby accounting for the observed uneven growth of plants in the fields. Destruction of soil structure may be observed as a result of desertification in the desert prone and also due to intensity of farm tillage in the wetland. The farmers reported to have observed this inform of further saltation of the soil. Continuous reduction in yield (97%) ,in this case the farmers reported to have observe decline in the quantity of harvest from the same piece of land using similar treatment and inputs year in year out. In terms of depletion of soil nutrients (97%), the farmers reported to have observe depletion in soil nutrient by through change in soil colour, reduction yield and loosing of soil structure. All the afore mentioned factors are common among both the farmers from river basin and those in the desert prone areas. On the other hand desertification (67%) and frequent water logging (31%) are peculiar to those in the desert prone communities and the water prone areas (River basin) respectively. This is in agreement with the findings of Hamdy and Aly (2014) who stated that 'degradation is manifested in general decline of soil fertility and Soil structure, degradation of irrigated land, and erosion of biological diversity.

Table 3: Percentage of Land under the Influence of Degradation

Size of Land (%)	**Freq.**	**%**
1 – 25	6	2
26 – 50	9	3
51 – 75	77	24
76 – 100	223	77
Total	**315**	**100**

On the basis of the aforementioned land degradation indicators/signs, farmers estimated the portion of their farm land which is degraded (Table 3). Majority (77%) of the smallholder farmers have 76% to 100% of their farmlands degraded. Farmers with the least portion of degraded lands were those with 1% to 25% per cent of their lands affected by degradation; and these farmers were very

few (2%). On the average, 1.98ha to 2.6ha of the farmland cultivated by 77% of the smallholder farmers found to be degraded. On the other hand, 0.026ha to 0.65ha of farmlands cultivated by 2% of the farmers was found to be degraded. This implies that majority of the farmlands in the study area are severely degraded, which is in agreement with the findings of Maiangua *et al.,* (2007) who stated that land degradation was found to be pervasive and multi-causal in the north-west zone of Nigeria. This further explains the reason behind the high prevalence of food insecurity in the areas under the study.

FOOD SECURITY STATUS OF FARMING HOUSEHOLD

A household is food secure when it has access to the food needed for a healthy life for all its member (adequate in terms of quality, quantity, safety and culturally acceptable), and when it is not at undue risk o losing such access. Food insecurity is: "A situation that exists when people lack secure access to sufficien amounts of safe and nutritious food for normal growth and development and an active and healthy lif (FAO *et al.,* 2012).Food security status of smallholder farmers in the study area is presented in table 4.

Table 4: Food Security Status of Smallholder Farmers

Food Security Status	**Freq.**	**%**	**Statistics**
Food insecure	278	88	
Food secured	37	12	
Minimum calorie intake person			0.08
Maximum calorie intake person			9.05
Mean calorie intake person			0.595
Total	**315**	**100**	

Source: Field Data 2016

It was found that 88% of the smallholder farmers in the study area were food insecure. This is higher than the percentage reported by Mamman *et al.,* (2016) in his work in which he reported that that 59.5% of smallholder farmers in Jigawa state were food secured while 40.5% were not secured. This implies that there is high prevalence of food insecurity among smallholder farmers in the study area which cannot be unconnected to the low productive capacity of the soil in the study area. All the selected communities were either faced with land degradation as a result of desertification or it is a water prone community faced with large scale water runoff, water erosion, invasion of typha and other notorious weeds, salts/chemical deposition or gully erosion which drastically reduces their land either in quantity or in quality. These factors greatly affect the productive capacity of the land thereby exposing the farmers to food insecurity. As indicated in Table 4, 37% of the households were found to be insecure with 0.08 minimum food security index and a maximum of 9.05. Average food security intake in the study area was 0.59 which is approximately half of the maximum. This implies that there were household members whose daily calorie intake is just around 232 Kcal per day. This is far below the average which is 1725.5Kcal per day while there were household members that consume up to 26,245Kcal per day. This also

indicates that the most food insecure population in the study area lives with calorie deficit of up to 2668Kcal per day. The average calorie intake is 1174.5Kcal short of the recommended calorie intake. This indicates inequitable distribution of food in the society.

FOOD CONSUMPTION PATTERN, FOOD AVAILABILITY, AFFORDABILITY AND ACCESS

Table 5 presents the estimated level of food availability, affordability and access for the households in the study area. It gives an insight into the nature of food security status of the respondents in terms of availability, access and affordability. Food security comprises of several different components, including food access, distribution of food, the stability of food supply and the use of food. (Schmidhuber and Tubiello, 2007).

Table 5 : Food Consumption Pattern, Food Availability, Affordability and Access

Incidence	Frequency	%
Annual Estimate (%) of Household's Food From Owned Production		
25	73	23.10
26-50	117	37.14
51-75	99	31.43
76-100	26	6.67
Duration (Month) of Food Availability		
3	35	12
4-6	127	40
7-9	95	30
10-12	58	18
Access to affordable food		
Access food at affordable price	6	2
Do not access food at affordable Prices	309	98
Consumption Frequency/Day		
Once	2	0.64
Twice	269	85.39
Thrice	44	13.97
Meal Adequacy		
Meal adequate	221	70
Meal not Adequate	93	30

Majority of the respondents (37.41%) were able to produce between 26 to 50 percent of their annual food supply. Only 6.67% were able to produce about 76 to 100 % of their annual food supply. This implies that only 6.6% of the smallholder farmers produce what they can live on for close to or up to a year. Forty percent of the respondents have availability of food for 3 to 6 month of the year while only 18% has availability of food for 10 to 12 months. In terms of affordability of food, 98%

of the respondents reported that they don't access food at affordable price while 85% of the respondents reported

that they consume food only twice a day while few consume once and thrice a day.

This explains the revelation made by some of the key informants during interview and focus group discussion that at the time of acute shortage of food they have no options rather than to send their children for forced migration. They revealed that they resort to sending the younger children for Almajirci (informal school) in the urban centres while the youth engaged in Okada (Motorcyclist) in the far southern parts of the country as a coping strategy. The Okadas would support the family by sending money(remittances) for the family to buy food within the periods when no food is available in the house until the rainy season comes back when all would come back to supply labour for the house hold. However, in the water prone areas, the migration takes place during the rainy season

Table 6 : Regression Analysis of food security status and socioeconomic characteristics of smallholder farmers

Variables	B	t	Sig
Food security Status	2.133	11.106	.000
House hold size	-.031	-6.097	.000
Age of Household Head	-.013	-4.648	.000
Level of education	-.074	-2.465	.010
Membership of Farmer group	-.108	-1.378	.169
Contact with Development Agent	-.154	-2.054	.041
Size of Farmland Under cultivation	-.001	-.261	.794

Table 6 shows the relationship between food security and household size .Age of household head was found to be significant with negative coefficient to food security of household. This implies that although age of the household head explain the household food security according to the model used, it indicates negative relationship which means the older the household head, the less food secure the household may be. This cannot be unconnected with the fact that as the household head grow older, his labour supply declines and hence less food supply form owned production. This is in agreement with Babatunde *et al., (*2007) who stated that "the age of household head is expected to impact on his or her labour supply for food production". It further implies that Young and energetic household heads are expected to cultivate larger farms compared to the older and weaker household head. This may affects the food stock of the household.

Household size measured in number of household members was found to be significant at 1% confidence level with negative coefficient. This implies that household size contributes to food security status of a particular household. It further implies that food security status of a household decreases with increase in household size. This finding is in disagreement with the findings of Babatunde *et al.*, (2007) that as the household size increase, the probability of food security increases. The disparity may be explained as increase in a household membership means an increase in demand of more food in the face of relatively small degraded land, this may justify the

negative impact of increase in household size on food security status of the household. Household size increase without increase in production efforts , increases demand for food without improving production thereby reducing food security.

Level of education of the household head was also found to be significant at (P= 0.010) with negative coefficient. This also implies that food security status of the small holder farmers depends on the his level of education among other explanatory variables. Although the level of education has negative impact on food security status of the households which implies that the more educated the farmer is the less food secured the household becomes according to the model. This is in disagreement with the apriori expectation as education is a social capital expected to increase the chance of a household to be more food secured. The result is also in dis agreement with the findings of various studies which indicated that the years of formal education were significantly related to household food security (Asogwa & Umeh, 2012; Olayemi, 2012) .Kirimi *et al.,* (2013), reported that the level of education of the household head has a positive relationship with household food security .How ever,the disparity can be explained looking at the nature of educational status of the respondents. Majority (51%) of the respondents has informal education as reported in table 4; this means that their low level of education could contribute to them in ability to adopt good land management and agricultural practices that could improve their productivity in such climate stressed area with highly degraded land that requires improved technology to attain optimum productivity. This is also in agreement with findings of janepha and Kumba, (2015) which stated that household heads with no formal education had very low incidences of food security and as the level of education of household heads increased to primary, and eventually increase with increase in the level of education of the household head.Contact with development agent also tested significant (P=0.041) . Increased contacts with the household head increases the probability of households to be food secure as a result of dissemination of improved farming technologies to the farm households which in turn increases production and productivity. This finding is in agreement with the findings of (Tewodros and Subaro 2013)

Size of farmland under cultivation also tested insignificant but shows negative coefficient. It implies that size of farmland under cultivation has negative influence on food security status of a particular household. This is inconsistent with the findings of many scholars. Positive relationship has been established between farm size and improvement in households' income and food security (Jayne *et al*., 2005; Deininger, 2003) However, the deviation of the result from the findings of Jayne, Deininger and other scholars can be explained as majority (77%) of the smallholder farmers cultivates land that is degraded by about 76 to 100% (Table 3). It is reported in Table 3, that on the average, 1.98ha to 2.6ha of the farmland cultivated by 77% of the smallholder farmers was degraded and the average land holding was 2.6ha. This means that an increase in land under cultivation could mean increase in degraded land that may result in wasted efforts looking at the high prevalence of unsustainable land management practices common among majority of the farmers. This further explains that the labour and other imputes that could have been concentrated in small land size may be wasted in large degraded land which in turn results in low output and hence low output for the house that greatly depend on their land for annual food supply as reported in (table 6).

Membership of farmer group also tested insignificant with negative coefficient. This also implied that food security status decreases with membership status of the farmers. Although farmer group should be a fora for peer review and sharing of knowledge which could lead to improvement of productivity and hence improved food security. However, the high prevalence of anthropogenic factors of land degradation in the area reveals that the farmer group may be a fora for exchange of unsustainable ideas considering at the low level of education among the majority of the smallholder farmers in the area.

COPING STRATEGIES ON FOOD INSECURITY

According to Sakyi (2012), food access is the ability of the household to acquire food regularly through one or a combination of home production and stocks, purchases, barter, gathering and hunting, gifts, borrowing, or food aid. Table 7' presents the food insecurity coping strategies adopted by the Smallholder farmers in the study area. The result revealed that reduction of quality of food and skipping meal ranked 1st (100%) as a measure of mitigation against food insecurity. This implies that all the respondents adopt both reduction in quality of food and skipping meals as a coping strategy against food insecurity especially at the time of food shortage.

Table 7: Coping strategies

Coping Strategies	Frequency	Percentage	Rank
Sales of Some Asset	306	97	3rd
Borrowing from friend	306	97	3rd
Consumption of less preferred Food	310	98	2nd
Supplementary Feeding	310	98	2nd
Reduction in Quality of Meal	315	100	1st
Skipping Meal	315	100	1st
Total	**n =315**	**100**	

Source: Field data

As indicated in previous discussion (Table 4), 85% of the respondents actually eats twice a day which means the respondents skips one out of the three square meal in order to Mize its food stock This finding is closely related to the finding of Idris,2008 in his work "Study of food security among farming house hold in Jere local government Area of Borno state, North eastern Nigeria in which he stated that" one of the major measure taken by majority of the house hold against food shortage was eating once. Households in the area achieve reduction in quality of food either by reducing the ingredients or the balancing supplements from the meal. For example, a house hold that cooks rice with a soup or stew may resort to serving rice with row pepper, or a pudding without soup but a mixed pepper .Second in the ranking of coping strategies are supplementary feeding and consumption of less preferred food both of which were ranked second as 98% of the respondents also adopts the both as a means of coping strategy against food insecurity. Eating less preferred food to cushion the effect of food insecurity has been a common practice in Nigeria. Baba Tunde *et al.*, 2007 in his work in which he studied the factors influencing food security status of house hold in North central Nigeria ,reported that practice of food insecurity coping strategy was eating less preferred food. Borrowing from Friend and sale of

asset are the third ranked coping strategy against food insecurity adopted by the respondents in the study area. Farmers do borrow food from those with larger food reserve during food shortage especially when the period is deeply in to dry season. The farmer borrows food against the next season when he/she makes harvest. In another development, house hold most often sales their most liquid asset such as live stocks to buy food at the period when food reserve is deflated. This work has established that the commonest practiced adopted by smallholder farmers in the sturdy areas to cushion the effect of food insecurity are skipping of meal and reduction in quality of food ,followed by supplementary feeding ,consumption of less preferred food and lastly Borrowing from friend and sale of asset.

SUMMARY

There is high level of food insecurity in the study area in-terms of calorie intake, accessibility, quality, affordability and utilization. Over 88% of the respondents were found to be food insecure with majority feeding twice a day. Skipping and consumption of less preferred food were found to be the major coping strategies against food insecurity by the respondents. Contact with development agents, level of education and household size were the major socio economic determinants of food security

RECOMMENDATION

1) High level of food insecurity in form of low calorie intake ,poor access to affordable food, poor foo stock file and meal inadequacy was found to be prevalent in the study area.In response to this,it i recommended that multi stakeholder approach employed to combart food insecurity through nutritio programs and extension of improved agricultural practices for improved yield and greater househol food supply.
2) It is recommended that holistic measures should be taken that will improve education in the study area This can be achieved through formal settings and also extension agents
3) It is recommended that the farmers form cooperatives in order to have easy access to investmen capital, quality seed and government interventions.
4)

REFERENCES

Adejoh, S. D. (2009). "Analysis of Production Efficiency and Profitability of Yam-Based Production Systems in Ijunmu LGA of Kogi State." M.Sc thesis Department of Agricultural Economics and Extension, Ahmadu-Bello University, Zaria

Adewuyi, S. A. (2002). Resource use productivity in food crop production in Kwara state,Nigeria.Unpublished PhD thesis, Department of Agricultural Economics, University of Ibadan.

Adeyemo, R., Oke J. T. O., and Akinola A. A. (2010). "Economic Efficiency of Small Scale Farmers in Ogun State, Nigeria." *Tropicultura* 28(2).

Ajibolade, E. O. (2005). Effects of land acquisition for large scale farming on the productivity of small-scale farming in Okitipupa LGA, Ondo State. Unpublished M.Sc. Thesis, Department of Agricultural Economics and Extension, Federal University of Technology, Akure.

Aliyu , S. Soji , A. and Ayo, S. (2013). Socially inclusive sustainable development in a climate stressed Northern Nigeria. A case study of Jigawa state. A study suppoted by Henrich Stiffung ,Nigeria.

Babatunde, R. O., Omotesho, O. A., & Sholotan, O. S. (2007). Factors influencing food security status of rural farming households in North Central Nigeria. *Agricultural Journal*, *2*(3), 351-357.

Egwuda, J. E. (2001). *Economic Analysis of Lowland Rice Production in Absaji Lga of Kogi State* (Doctoral dissertation, MSc Thesis, Ahamadu-Bello University, Zaria).

Ekunwe, P. A., Orewa, S. I., & Emokaro, C. O. (2008). Resource-use efficiency in yam production in delta and Kogi States of Nigeria. *Asian journal of agricultural research*, *2*(2), 61-69.

FAO (Food and Agriculture Organization) (1994). Land degradation in south Asia: Its Severity, Causes, and Effects upon the people, Rome.

FAO, W. F. P. IFAD (2012) The state of food insecurity in the world 2012. Economic Growth is necessary but not Sufficient to Accelerate Reduction of Hunger and Malnutrition. FAO, Rome, Italy, 1-61.

Hamdy, A., & Aly, A. (2014). Land degradation, agriculture productivity and food security. In Fifth in ternational scientific agricultural symposium, Agrosym2014. http:// www. agrosym. rs. ba/ agrosym/ agrosym_.

Janepha, K. and Kumba , (2015). The Role of Household bCharacteristics in Determining Food Security in Kisii Central Sub-County, Kenya Department of Geography, Egerton University

John, E., Murray, M.,, and Peter, N., (1989). Social Economics: The New Palgrave, p. xii. Topic-preview links, pp. V-vi.

Kirimi, L., Gitau, R., & Olunga, M., (2013). Household Food Security and Commercialization among Smallholder Farmers in Kenya. www.ageconsearch.umn.edu/...0Millicent%20Olunga.pdf

Maiangwa, M. G., Ogungbile, A. O., Olukosi, J. O., and Atala, T. K. (2007). Land Degradation: Theory and Evidence from the North-West Zone of Nigeria. *Journal of Applied Sciences, 7: 785-795.*

Odera, M. M., Kimani, S. K. and Musembi, F. (2000). Factors affecting the adoption of integrated use of manure and inorganic fertilizer in central high lands of Kenya.In collective and participatory research for sustainably improved lively hoods, Proceedings of the 7th Biennial Scientific conference, Kenya Agricultural research institute(KARI)Nairobi Kenya,58-64.

Odera, M. M., Kimani, S. K. and Musembi, F. (2000). Factors affecting the adoption of integrated use of manure and inorganic fertilizer in central high lands of Kenya.In collective and participatory research for sustainably improved lively hoods, Proceedings of the 7th Biennial Scientific conference, Kenya Agricultural research institute(KARI)Nairobi Kenya,58-64.

Ojowu,, O., Hashimu, B.,, and Bitrus, O. (2007) "Nigeria poverty assessment." *Abuja: National Bureau of Statistics*

Oladeebo, J. (2006). "Economic Efficiency of Rain-Fed Upland Rice Production in Osun and Oyo States of Nigeria." Phd Thesis Department of Agricultural Economics and Extension, FUTA, Akure.

Oladeebo, J. (2006). Analysis Of Factors Affecting Technical Inefficiency Of Smallholder Farmers In Nigeria: Stochastic Frontier Approach. *International Journal Of Economics, Commerce And Research (Ijecr), 1*(3), 21-28.

Oviasogie, D. I. (2005). "Productivity of Yam-Based Farming System in Edo State, Nigeria." Msc Thesis, Department of Agricultural Economics, FUTA, Akure.

Raosoft, (2004). Raosoft Sampling Calculatore © 2004 by Raosoft, Inc. www.raosoft.com

Sakyi, P. (2012). Determinants of food accessibility of rural households in the Limpopo province: South Africa. Unpublished. Masters of Science in Nutrition and Rural Development, Gahent University, Ghent.

Sakyi, P. (2012). Determinants of food accessibility of rural households in the Limpopo province: South Africa. Unpublished. Masters of Science in Nutrition and Rural Development, Gahent University, Ghent.

Sanchez, P. A., and Jama, B. A. (2002). Soil fertility replenishment takes off in East and Southern Africa.In From concept to practice Integrated plant nutrient management in sub-Saharan Africa,23-46 (Eds B. Vanlauwe, J. Diels N. Sanginga and R.Merckx). second meeting of the working group on soil degradation assessment methodology. FAO, Rom e

Schmidhuber, J., & Tubiello, F. N. (2007). Global food security under climate change. *Proceedings of the National Academy of Sciences*, *104*(50), 19703-19708.

Stringer, L. C., & Reed, M. S. (2007). Land degradation assessment in southern Africa: integrating local and scientific knowledge bases. *Land Degradation & Development*, *18*(1), 99-116.

Tewodros, T. and D.V. Subaro., (2013). Participation in land market and technical efficiency in Southern Ethiopia: A case study after 2005 land proclamation of Ethiopia, Journal of Development and Agricultural Economics, Vol. 5(9), pp. 372-381, September, 2013

Wiebe K. (2003). Linking Land Quality, Agricultural Productivity, and Food Security., Resource Economics Division, Economic Research Service, U.S. Department of Agriculture. Agricultural Economic Report No. 823.www.odi.org.uk/resources/download/4662.pdf [Accessed on 28 January 2010].

Yaro, I. (1999). Review paper on the production trials of rice-cum fish culture-a transferable concept into Niger State, Nigeria.