

Factors Influencing Households' Food Security Status among Rural Farmers in The Central River Region South of The Gambia.

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Abstract

Food insecurity is a major challenge in The Gambia especially for rural farmers who depend largely on rainfed agriculture for their livelihoods. Therefore, this research investigates the factors influencing households' food security status. Semi structured questionnaires were used to collect data from 219 rural farm households. Using a logistic regression model, the result show that, age of household head, household income, household assets, household economic activities, assistance, remittance and household land ownership had significant effect on households' food security status. From the findings, it is evident that food insecurity remains a challenge that affects rural farmers in the southern part of central river region of The Gambia. Thus, households need be encouraged to diversify their farming practices such as growing other non-traditional food crops and other economic activities to attain food security.

Keywords: Food insecurity, Logistic regression, Rural Farmers, The Gambia

Résumé

L'insécurité alimentaire est un défi majeur en Gambie, en particulier pour les agriculteurs ruraux qui dépendent largement de l'agriculture pluviale pour leur subsistance. Par conséquent, cette recherche étudie les facteurs qui influencent la situation des ménages en matière de sécurité alimentaire. Des questionnaires semi structurés ont été utilisés pour collecter des données auprès de 219 ménages agricoles ruraux. En utilisant un modèle de régression logit, le résultat montre que l'âge du chef de ménage, le revenu du ménage, les actifs du ménage, les activités économiques du ménage, l'assistance, les transferts de fonds et la propriété foncière du ménage ont eu un effet significatif sur la situation de sécurité alimentaire des ménages. D'après les résultats, il est évident que l'insécurité alimentaire reste un défi qui affecte les agriculteurs ruraux dans la partie sud de la région du fleuve central de la Gambie. Il faut donc encourager les ménages à diversifier leurs pratiques agricoles, par exemple en cultivant d'autres cultures vivrières non traditionnelles et en menant aussi d'autres activités économiques pour atteindre la sécurité alimentaire.

Mots clé : Sécurité alimentaire, régression logit, agriculteurs ruraux, Gambie.

This paper was presented at the Conference on Climate Change and Food Security in West Africa co-organized by Université Cheikh Anta Diop de Dakar (UCAD) and Center for Development Research (ZEF), University of Bonn, on 17-18 November 2019 in Dakar, Senegal.

Introduction

Household food security continue to be a global concern especially in Sub-Sahara Africa due to rapid population growth and the fact that the factors affecting households' food security status are complex and multidimensional. There are no universal causes of food insecurity, instead, the phenomenon varies between countries, culture groups and from one household to an individual, depending on their coping strategies. Although efforts to improve food security at national and household levels several factors are responsible for household food insecurity in The Gambia. Citing FAO (2012), Zakari *et al.*(2014) stated that approximately 870 million people globally are estimated to have been undernourished (in terms of dietary energy supply) in the period 2010 – 2012, representing 12.5% of the world's population. A large proportion of these undernourished people live in developing countries, with sub-Saharan Africa having the highest prevalence of under-nourishment. There is scientific evidence that climate change is among the many factors affecting the achievement of food security and Sustainable Development Goals (SDGs) across the world, especially in developing countries. Despite diverse adaptation efforts employed at all levels, the effects are adverse and are felt mostly in developing countries, especially in rural areas due to insufficient capacities to effectively adjust or adapt to the effects of climate variability (Ochieng *et al.* 2016). As illustrated by Mendelsohn (2008); FAO (2009) and Ozor N. *et al.* (2015), the most affected sector by climate change in Sub-Saharan Africa countries is agriculture. This is due to the high dependence on rainfall for household food production.

Climate change extremes such as floods, drought, changes in temperature and precipitation, which in turn reduces vegetation cover, water resource availability, soil quality and changes in land-use practices, such as conversion of land use, pollution and depletion of soil nutrients which, are among the factors affecting crop yield or food production. Land degradation is considered as one of the most severe environmental and socio-economic problems of recent times in Sub-Saharan Africa (Abdi *et al.*, 2013; The World Bank, 2008). Meanwhile, if there are uncertainties concerning the direct effects of climate change on human well-being, then, negative aspects are most likely to be pronounced. Many empirical studies have indicated that Sub-Saharan and tropical regions of African countries are more susceptible to food instability as a result of reduction of croplands under production and productivity, rainfall irregularity and intensity, land degradation and loss of soil/land fertility resulting from erosion (Brauch 2010) and (Abdi *et al.*2013). Climate change and variability will, therefore, exacerbate and negatively affect all the domains of food security—availability, accessibility, utilization and stability—thus, increase in food prices affects food accessibility and affordability for the poor people (FAO, 2009). Thus this study helps to underscore the underlying factors affecting food insecurity among rural farmers in the Gambia considering their over dependence on rainfed agriculture which is climate driven.

1. Factors influencing Household Food Security Status

Factors influencing household food security status are complex and multidimensional. There are no universal causes of food insecurity but the phenomenon varies from country and cultures and from one household to individual, depending on their coping strategies. Several factors are responsible for household food insecurity in the study area. This was clear during the survey that factors such as the socio-economic characteristics of the household are crucial in determining household food security. The most vulnerable groups to food security are rural households who depend on crop production for livelihood. Moreover, the relationship between food insecurity and poverty are strongly correlated. Poverty not only leads to food insecurity but

also decreases purchasing power for other goods and services such as housing, energy and water needed for their household.

Household food insecurity means that people either do not have access to food or are unable to purchase food needed for family consumption. In either case, they had to suffer from the hardships of hunger and poverty as a result of food insufficiency. Earlier researches and literatures suggests that the causes of household food insecurity include among others, long period of poverty, lack of adequate productive resources, corruption, fiscal imprudence, huge debts and policy inconsistency, number of extension visits, access to proper irrigation facilities, sustainable land management, access to market information and market infrastructure, good electricity systems to transform and store food items, good road network systems and above all, early warning systems to adapt and mitigate the effects of climate change on food security dimensions, etc.

Moreover, the age of household members, household education level, the size of the household, household income, the main economic activities of the household, access to market, access to credit, household access to assistance, remittances and food aid as well as household assets and land ownership as lamented by Mango *et al.* (2014) are among the other factors that are likely to influence household food security status. This argument was supported by Asghar and Muhammad, (2013) who reported that low household income is a major element that can negatively affect household food status. This is evident in fact that, households with low income lack sufficient funds to purchase food items during food shortage and thus, are likely to face food insecurity.

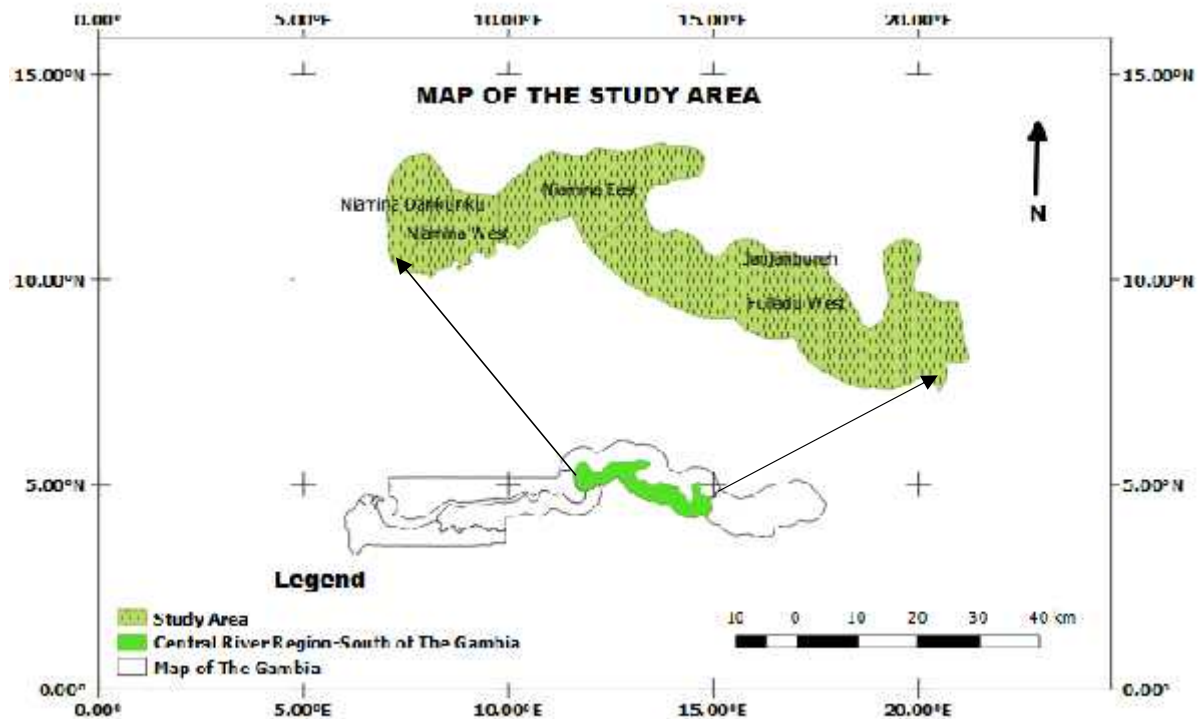
Furthermore, ownership of land, access to credit and assistance (cash or kind) combined with advance agricultural technologies have the potential to increase agricultural production and productivity of households who depend on rain-fed agriculture for their food production (Kassie *et al.* 2011). The findings further revealed that improved in agricultural technologies such as use of improved crop varieties, and overall improvement in agronomic practices that are geared towards increasing crop yields can significantly mitigate and reduce household food insecurity. (Kassie *et al.* 2012) also opined that the risk of crop failure can be mitigated through water use efficiency technologies, for example (drip) irrigation thereby increasing household food production.

2. Materials and Methods

2.1. Description of the Study Area

The study is conducted in the Central River Region-South of The Gambia. It lies on the southern part of River Gambia, stretching from Sofaa Naima Bolong (Pakaliba Bridge) in the West to Farato Village in the East. Specifically, three districts in the region were studied. This is shown in Figure 1. The study was conducted in three randomly selected districts of the region.

Figure 1: Map of the Study Area



Source: Field Survey, (2017). Author's construct

Like other regions of The Gambia, almost all the residents of the Central River Region-South depend directly or indirectly on agricultural activities (Loum and Fogarassy, 2015). The main crops grown include groundnut, maize, early millet, rice, sorghum and sesame. Equally, they also depend on small livelihood activities such as traditional souvenirs, basket making, bead making, petty trading, carving, fishing and household vegetable production. Some households in the region also engage in animal husbandry such as cattle, goat, sheep and poultry. These activities vary during the dry season, making them more vulnerable to food insecurity.

The Central River Region-South is selected as a case study due to three major reasons. First, it can be classified among the most vulnerable regions to climate variability and food poor due to their large dependence on rain-fed agriculture for food production as their livelihoods. Second, not many studies have been done on the effects of climate change and variability on household food security. Third, the spatial settlement of the communities makes it difficult for rural infrastructural and socio-economic development. Therefore, this research focused on the effects of climate variability on household food security among rural farmers in Central River Region-South of The Gambia. The numerous factors that affect food production and household food security in the study area includes, among others:

- the number of households and individuals depending on agriculture for livelihood;
- the number of food poor, vulnerability and low adaptive capacities to the effects of climate change hazards such as drought and floods;

- poor rural development (such as industries) and lack of social infrastructures (such as roads, electricity and transportation networks especially) in the villages located in the interior of the region; and
- poor socio-economic development at household level.

2.2. Sampling procedure and data collection

A multistage sampling method was used for this study. The first stage was the purposive selection of one region in country. The Central River Region-South was selected due to its climate sensitivity, high food poverty levels and high participation in farming which is predominantly rain-fed and subsistence. In the second stage, purposive sampling technique was used to select three districts from the six districts in the region. Using the socio-economic data obtained from GBOS, three most vulnerable districts and food poor in Central River Region-South were purposively selected. These are Niamina West, Niamina East and Lower Fulladu West districts. Names of each village and population in each selected district was imputed in the Microsoft excel statistical tool using the randomization formula to select the villages. Three villages were selected from each district using simple random sampling procedure, making a total of 9 villages for the entire study area. The selected communities are Kumbaney Buniadu, Sambang Mandinka Kunda and Katamina from Niamina West district; Sambel Kunda, Sotokoi and Kerewan Touray from Niamina East; and Sinchu Magai (Mara Magai), Medina Ceesay Kunda and Sankuleh Kunda from Lower Fulladu West district.

In the last stage, simple random sampling was used to select households from each community. In each selected household, the household head was interviewed. In the absence of the household head, any adult member (more than 25 years) was allowed to answer the questionnaire on behalf of the head. In all, 219 household heads were interviewed for the entire study.

The study used a primary data that was collected using questionnaire. The data include socio-demographic characteristic of households, household food security components (availability, accessibility, utilization) household coping strategies to food shortages, perception on climate change, household preferred sources of climate information, and the challenges farmers faced in their farming systems.

2.3. Data Analysis

Logistic regression model was used to analyze the various factors influencing household food security status in the study area. Various researchers including Abdullah *et al.*,(2017) have used this model to analyze different factors influencing household food security. The model was used to describe the relationship between one or more independent variables (e.g., age, household income, asset index, remittance, etc.) where there is a binary response variable – the likelihood of attaining household food security within the communities – which is expressed as a probability.

The dependent variable, food security status, is dichotomous, which means that it only takes two values either a household is food secured or it is not, so by pursuing the conventional method of binary response it will either take the value of one (1) and zero (0). In this study, a household is classified as 1 if the household is food secured and 0 if food insecure. This can be achieved by using the linear probability model (LPM). But this LPM is plagued by many problems including heteroscedasticity of the error term, the possibility of ‘y’ lying outside the

range (0, 1). To avoid the problems associated with the LPM, the relationship is modelled in such a way that 'y' is unobservable variable and the relationship is given by;

$$y = 1 \text{ if } y > 0 \\ 0 \text{ if } y < 0$$

Where 1 stands for food security and zero for food insecurity. Logistic regression technique is used to model the relationship between the dichotomous dependent variable and set of independent variables that are hypothesized to affect the outcome.

The log odd of the outcome in logit model is a linear combination of the predictor variables. The simple form of logistic model, according to Peng *et al.*(2002) is shown below:

$$\text{Logit}(Y) = \text{natural log (odds)} = \ln \left(\frac{\pi}{1-\pi} \right) = + x_i \dots\dots\dots \text{Equation (1)}$$

This equation helps us to predict the likelihood of the occurrence of the result of interest. This is using antilog in both sides of equation (1) as shown below:

- Where;
- = probability outcome of interest
- x= Y intercept
- = regression coefficient
- e= 2.71828 (the base of natural logarithms)
- x= binary or continuous variables

2.4. Description of the Model

Logistic regression model was applied to examine the effect of various independent variables. The food security status was modeled as a binary response variable where 1 = food secured and 0 = food insecure. The overall predictive power of the model was significant, indicating that dependent variables had significant impact in explaining the food security status. The independent variables which had significant effect on household's food security status were household income, household assets, household economic activities, assistance and remittance.

Each of the regression coefficients describes the size of the contribution of that factor to the securing household food status. In other words, the coefficients illustrate how much the logit changes are based on the values of the predictor variables. A positive regression coefficient means that the explanatory variable increases the probability of the outcome, while a negative regression coefficient means that the variable decreases the probability of that outcome.

Table 1: Description of the Variables used in the Model

Variables	Dependent variable	Description and Measurement
Food Security Status (FS)		D = 1 if HH is food secure; 0 = otherwise
Independent Variables		
Education (ED)		D = 1 if HH head is literate; 0 = otherwise
Household Size (HS)		D= Number of household members
Age (A)		D= Age of HH head in number of years
Household Income (HI)		D= Household income
Asset Index (AI)		D= Number of Household assets
Economic Activities (EA)		D= 1 if HH main economic activity is crop production; 0= otherwise
Land ownership (LO)		D= 1 if HH own land; 0= otherwise
Assistance (AS)		D= 1 if HH receive assistance; 0= otherwise
Remittances (RM)		D=1 if HH receive remittances; 0= otherwise
Access to Market (AM)		D= 1 if HH has access to market; 0 = otherwise
Access to Credit (AC)		D= 1 if HH has access to credit; 0 = otherwise
Food Aid (FA)		D= 1 if HH received food aid; 0= otherwise

Source: Field Survey, 2017

3. Results and Discussions

3.1. Gender

Out of the 219 households surveyed, the results indicated that 83.1% of the households were male headed while 16.9% were headed by females as shown in table 4.1. This shows the dominance of male headed household in the study area. This affects and limits their access to most natural resources such as land thus affecting their involvement in commercial agricultural production. Despite their substantial contribution to household food security, cultural beliefs limit women in practicing permanent food crops or plants.

3.2. Marital Status

As shown in table 2, 70.3% of the surveyed households were involved in monogamous married and 21.9% were in polygamous married. The results also shown that 4.6% of the respondents were widowed while 3.2% were single. In terms of food production, this has a positive implication especially for households that are involved in agricultural activities. This is because married farmers who are engaged in active farming activities could have the support of their spouse(s) in terms of labour and also help supplement the income needed to acquire agricultural input. Citing Nnadi *et al.* (2012), Ozor N. *et al.* (2015) illustrated that marriage encourages, support and promote adaptation efforts among farming communities, thus improving household livelihoods.

3.3. Age

Majority (30.6%) of the respondents were within the age bracket of 37-48 years and 31.1% were within 49-60 years old. There suggest that the majority of the respondents in the study area were predominantly in their middle ages hence, are economically active and thus can provide manpower for food crop production.

3.4. Household Size

The data revealed that majority (46.6%) of the surveyed respondents had household sizes between 10-17 persons while 37.9% and 11.9% had household sizes of 2-9 and 18-25 person respectively with the average household size of 12 persons per household. This indicates that most of the households within the surveyed area have fairly larger family sizes. The lowest family size was 2 while the largest was 40 persons. Although the large household size would be a source of labour for crop production, it also suggests that there are mouths to feed, hence the need for food production. The challenge would be to find a balance between feeding the large household size and the labour they provide.

3.5. Education

The results revealed that 58.4% of households have attended lower basic education in English and Arabic education known as 'Madrassa' while 8.2% and 5.0% have attended Upper Basic School in English or Arabic education systems respectively. In addition, the results also illustrated that 24.7% of household had no form of education. It can be inferred from this that the majority of the respondents in the study area are literates although their level of literacy differs.

Abid *et al.* (2015) reported that acquisition of formal education will enhance the adaptation of improved agricultural technologies that are expected to positively improve their livelihood, thus food security. Household education can contribute significantly to the household's resilience. This implies that a household with a highly educated head would have high resilience to the impacts of climate change than those without education. This is similar to the study by Nyangas and Chingonikaya (2017) which found that respondents attaining various trainings or formal education are able to increase their income by undertaking skilled non-farm activities, which are less climate-sensitive compared to farming and grazing, thereby helping the households to avert climate risks and hence increase their household resilience to the impact of climate change.

Table 2: Demographic and Socio-economic characteristics of the Respondents

Variables	Frequency	Percentage (%)
Gender (n=219)		
Male	182	83.1
Female	37	16.9
Age of household head (n=219)		
25 -36	20	9.1
37-48	67	30.6
49-60	68	31.1
61-72	50	22.8
73 and above	14	6.4
Marital status (n=219)		
Single	7	3.2
Married monogamous	154	70.3
Married polygamous	48	21.9
Widowed	10	4.6
Household size (n=219)		
2-9	83	37.9
10-17	102	46.6
18-25	26	11.9
26-37	7	3.2
33 and Above	1	.5
Educational level of Household head (n=219)		
Never attended school	54	24.7
LBS/Madrassa	128	58.4
UBS/Madrassa	18	8.2
Secondary	11	5.0
Tertiary	8	3.7
Economic activity (n=219)		
Crop production	195	89.0
Petty trading	3	1.4
Fishing/hunting	4	1.8
casual works	9	4.1
Others	8	3.7

Source: Field Survey, 2017

J Household Main Sources of Food

The main sources of food in the household can be categorized into two; own production and from purchase. Out of the 219 respondents interviewed, an overwhelming proportion (90%) of them reported that their primary source of food consumed in the households is from their own production while 10% of the respondents reported that purchase is the first source of household food supply. Considering that the study is conducted in farming communities, it was expected that majority of the households would engage in crop production primarily for household consumption.

Though the findings revealed that the majority of households were engaged in farming, almost all households are net food buyers. Most of the households do not produce sufficient food quantities to cover the household consumption needs throughout the year. Some of them sell part of their production to cover the production expenses and other income needs such as children school fees and other social events. The vulnerability to food insecurity is more severe during poor harvest seasons in which most households were unable to produce enough food to keep feeding their members throughout the year.

Figure 2: Distribution of Households' Main Sources of Food



Source: Field Survey, 2017

Crop diversification practiced by households can be seen as a measure taken to adapt to adverse effects of climate change, considering uncertainties facing onset and cessation as well as the distribution of rainfall. This was further manifested by household heads and stakeholders during FGD in the study area. In The Gambia, most of agricultural activities employed by farmers are labour intensive, time consuming with little returns. Muzamhindo (2015) also opined that the development of labour-saving technologies, improved access to credit and extension will increase the likelihood of adaptation to climate change by vulnerable farmers who depend largely on rain-fed agriculture.

A similar study conducted by Ozor *et al.* (2015) illustrated that household who practice crop diversification and household gardening are more resilient to food insecurity. Household food production is a key instrument in determining food availability. Any activity within the capacity of household to secure food can be considered as production. FGD further revealed that the majority of the households sell a large proportion of the farm produce to the market to supplement other household needs such as providing education and other basic needs of the household. In addition, petty trading constituted 10.5% and livestock 11.0% respectively contribute greatly in generating household income needed to complement household food needs.

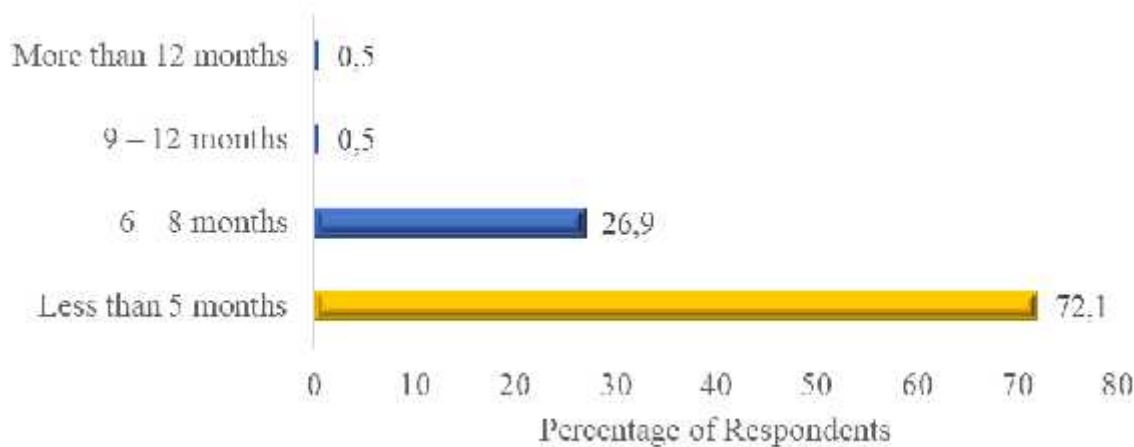
) **Household Food Availability Status**

Findings from household interview revealed that, most of the respondents (72%) reported that farm produce can only cater for less than 5 months for family consumption while 26.9% of the surveyed respondents explained that their farm produce can only cater for 6-8 months. Findings further revealed that only 0.5% of the respondents narrated that their farm produce can cater for 9-12 and more than 12 months respectively. This can be further attributed to the family sizes and poor harvest among many other factors. Most of the respondents expressed their views during

FGD that climate variability and lack of adequate farm inputs are the main contributing factors to poor yields. Poor storage and processing facilities was also highlighted due to fact that most of the interviewed communities lack these facilities.

To attain household food security, efficient assessment is vital to highlight the number of months on which households depend on their own farm production is important. In most cases, household food production is inadequate to feed the entire family all year, even in normal rainfall years. This is mainly as a result of extended families depending on a single source of livelihood. This compelled most households to struggle to get additional food from other sources such as remittance and neighbourhood assistance during months of food shortage. Due to their large dependence on rain-fed agriculture, climate variability is expected to exacerbate and further complicate the number of months of food shortage for households by lowering crop yields which is subsequently caused by unreliable rainfall pattern and shorter growing seasons. During FGD, the majority of the respondents affirmed that food security is a serious challenge and it severely affects livelihoods as the majority of the respondents expressed that their own farm produce cannot feed their household for the whole year. The probable reason why their own food production is not enough to feed the family may be a function of many different factors, like climatic condition, loss of soil fertility, or the loss of household productive assets or some other related challenges. With regards to the surveyed population, most of the factors contributing to household food insecurity can be identified as unreliable rainfall pattern and lack of farm inputs.

Figure 3: Distribution of Respondents’ Time Periods that their Farm Produced Lasts



Source: Field Survey, 2017

) **Factors Influencing the Household Food Security Status in the study area**

The logistic regression model results indicated that education, age household income and household economic activities (crop production, livestock rearing and petty trading), land ownership, assistance form friends or relatives and remittances were found to have positive significant on food security status.

Table 3: Logistic Regression Coefficient Showing the Factors Influencing the Household Food Security Status

Food Security Status	Coef.	Std. Err.	Z	P-value
Education	1.116957***	.9102449	1.23	0.002
Household Size	-.0272264	.054765	-0.50	0.619
Age	.0433891	.0267083	1.62	0.004
Household Income	.0001868*	.0001031	1.81	0.070
Asset Index	.0403017**	.0197466	2.04	0.041
Economic Activity	-2.272404***	.859962	-2.64	0.008
Land Ownership	.5826386**	1.157704	0.50	0.010
Assistance	-1.934729**	.9704878	-1.99	0.046
Remittance	2.29223***	.8067339	2.84	0.004
Access to Market	.4612084	.6913773	0.67	0.505
Access to Credit	.1758985	.424602	0.41	0.679
Food Aid	1.168522	1.218525	0.96	0.338

*The significance level are denoted as follows: ***1%, **5% and *10%*

Source: Field Survey, 2017

The results from the model indicated that education has a positive influence on household food security status ($P = 0.002$). This implies that the more educated a household head is, the more likely food secured the household would be compared to the less educated household. The findings corroborate with the research conducted by Asghar and Muhammad, (2013) which substantiated that education played a key role in enhancing household food security status. Educational attainment by the household head could lead to awareness of the possible advantages of modernizing agriculture by means of technological inputs etc. this will enable and encourage diversification of household incomes which, in turn, would enhance households' food supply. Education provides knowledge, awareness and increases the chances of obtaining paid job to effectively adapt to climate effects and food shortage periods, thus enhancing household livelihood.

Age is another important factor which determines and influence household food security status. The resulted from the models shows that age was positive ($P=0.004$). It can be noted that household food insecurity varies significantly among different age groups. The assumption here is that, the older the head of the household is, the higher the chance to enhance the food security status as there may be many options of making food available from both agricultural and non-farm opportunities. This is evident that older people are more committed to agricultural activities than the younger ones. The younger ones on the other hand, are not fully engage in agricultural production even though younger household heads are stronger and are expected to undergo more stress to cultivate large size farm than their older counterparts. This is due to the fact that the substantial movement of the youths within the country and outside the country through (back-way), seeking for good paid jobs is a major contributing factor to this phenomenon. Since rural livelihood depends largely on their farm production, those who are fully engaged in agricultural activities are more likely to be food secured than those who are less involved.

This results further illustrated that household with higher income earnings are more likely to have a higher purchasing power and are more likely to be food secured than household with low income earning while households whose primary occupation is crop production are more likely to be food secured than those who do not grow crops.

Household assets were found to have a significant effect on household's food security status. Assets in this case comprises car, motorbikes, carts, mobile phones, wheelbarrow, television set, radio/tape generator/solar. From the data, it was found out that most of the respondents have household assets. The result demonstrated that households having assets were more likely to be food secured compared to non-assets holders. This finding is in conformity with the study conducted by Chang *et al.* 2014 which outlined that the lack of resources is associated with increased food insecurity at all levels.

It could be further noted that assistance and remittance play a significant role in enhancing food security status. In recent decades, remittance becomes one of the important sources of income and external financial source for many people in The Gambia. The effect of remittances was found positively significant ($P = 0.004^{***}$) while assistance was found significant with ($P = 0.046^{**}$). It is evident in the study area that people, receiving assistance or remittances, were more likely to be food secured than those who are not receiving assistance or remittance. This demonstrated that remittance can increase the purchasing power of household (Akano *et al.* 2013). Those household who receive remittances are more likely to increase their purchasing power of food varieties and are also more likely to be food secured, while household who do not receive remittances are less likely to be food secured. Assistance and remittances are considered an important source of additional earnings that can support and enhance household food security.

Moreover, land ownership is also another important variable in determining household food security. The model indicated that land ownership was positive ($P = 0.010$). This depicts that household who own land are likely to be more food secured than household with no land ownership. Land ownership will allow household to have access to land and can sell the land to enhance household food security status. However, the rapid population growth and land fragmentation can negatively affect access to land for agricultural activities.

Conclusion

Factors affecting household food security status in the study area are complex and dimensional. From the logistic regression model, it can be concluded that the factors that influence household food status include, age, household income, household assets, household economic activity, access to finance assistance and remittance, and land ownership. These factors have affected the ability of household to adequately address household food status. It must be noted that household food insecurity is high among rural farmers in the study area

Attaining food security is among the most significant development challenges faced by government of The Gambia. In fact, there is sufficient evidence to admit that it is the most urgent task faced by many countries today. Attaining sustainable food security requires a complex and a holistic approach from both public and private sectors and other actors. It implies reaching a number of development goals, including motivating agricultural production, intensifying livelihood opportunities, increasing incomes, and improving nutrition directly at household level. Currently food security had become virtually synonymous with development.

Recommendation

Households need to be encouraged to diversify their farming practices such as growing other non-traditional food crops. Introduce other non-traditional crops, and livestock, that are climate-tolerant; for example, short-season maturing crops, drought-tolerant crops, aquaculture, high milk-yielding livestock, and poultry production, all aimed at diversifying food production systems thereby enhancing household food security status.

Farmers, Government and institutions should help to establish cereal banks that would enhance the coping mechanisms toward food availability throughout the year. It is evident that climate change extremes such as rainfall, temperature have repercussion on major cash and cereal crops production. Therefore, establishment of cereal banks in Central River Region-South of The Gambia will help households to store their food items for a long period of time and use them whenever needed, especially during critical months of the year that are considered “the hungry season.” The stored food will serve as buffer against high food prices during the critical months of the year.

Government, Non-Governmental Organizations and institutions should facilitate easy access to micro-credit and farmer insurance systems where farmers can easily recover from any climate-induced food shocks. Micro-credit plays a very important role in enhancing household food security status. Farmers can use micro-credit to purchase farming equipment that can be used to boost production and productivity. This can be done through establishment of farmers associations and micro-financed groups among rural farmers where loans can be easily access and managed by themselves with the support of government or financial institution. Farmer insurance systems need to be established and extended to cover rural farmers. Since farmer insurance systems covers and compensate victims, will help farmers recover from any climate-induced losses of crops, thus enhancing their resilience and coping mechanisms to food shortage periods.

Declaration of conflict of interest

We the authors of this manuscript have declared no conflict of interest.

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