

FOOD INSECURITY VULNERABILITY STATUS OF FARM HOUSEHOLDS IN NIGER- DELTA, NIGERIA.

Offiong Uma Ukpe

Department of Agricultural Economics, University of Nigeria, Nsukka, Nigeria
E-mail: fifiukpe1@yahoo.com

Noble Jackson Nweze

Department of Agricultural Economics, University of Nigeria, Nsukka, Nigeria

Chukwuemeka John Arene

Department of Agricultural Economics, University of Nigeria, Nsukka, Nigeria

Abstract

The study assessed the vulnerability of farm households in Niger Delta to food insecurity. Four States were randomly selected from the region. Primary data were collected from 384 crop farmers, stratified into beneficiaries and non beneficiaries of microcredit schemes using multi-stage sampling technique. The data were analyzed using Vulnerability Index Analysis. The vulnerability indicators assessed in this study were: education, farm size, land ownership status of the farmer, access to remittance, household size, farm income, age of household head, asset value, dependent relatives and co-operative membership. Results show a high level of vulnerability among non- beneficiary households (0.55) and low level of vulnerability among beneficiary households (0.47). Based on the result, the study recommended among others, that the scope of microcredit should be expanded and the volume increased to reduce farmers' vulnerability to food insecurity in the study area.

Key words: Food, Households, Insecurity, Niger-Delta, Vulnerability.

1. Introduction

Agriculture provides food, employment and a means of livelihood for more than 60 percent of the productively engaged population in Nigeria (Attah, 2012). Regardless of the high level of involvement of Nigeria in agriculture, acute shortage of food as a result of low productivity remains a major problem (Oni, 2008). Agriculture receives less than 10 percent of the annual budgetary allocations in Nigeria (Omeje & Ogbu, 2015). In 2013, 83 billion naira was allocated to the sector out of the over four trillion naira budget proposal, this was just 1.7% of the budget. In 2014 and 2015, it was allocated 1.47% and 0.89% of the budget respectively, a far cry from the 10% agreed by African Union member States to commit to agriculture in the Maputo declaration on agriculture and food security (Federal Ministry of Agriculture and Rural Development, 2015). Underfunding in this regard is central to the crisis of food production and food insecurity in Nigeria (Vintagesam, 2014). The loss of food sovereignty and dependence on food importation is also making the country quite susceptible to fluctuations in global crisis. The vision of Nigeria to have physical and economic access to food on a continuous basis has therefore continued to remain a mirage (Rahji and Fakayode, 2009); (Adeyeye, 1999). Over forty percent of households across all agro-ecological zones in

Nigeria face the problem of severe food insecurity (Maziya-Dixton, Akinleye, Oguntona, Nokoe, Sanus and Hariss, 2004).

The Niger Delta region of Nigeria until recently has experienced series of unrest that has adversely affected the economy of the area and that of Nigeria as a whole (Omofonmwan and Odia, 2009). Unlike other developing countries, the unemployment and poverty rates in post-conflict Niger Delta have become predominant (Ministry of Niger Delta Affairs, 2011). Thus, majority of those engaged in agriculture are poor and therefore engulfed in serious financial obstacle to escape the vicious circle of poverty (Obamuyi, 2008). These resource poor farmers are faced with the problems of reduced agricultural productivity, increased hunger, malnutrition and diseases (Odjugo, 2010).

Food security is one of the several necessary conditions for a population to be healthy and well nourished. Food security refers to a situation that exist 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 for an active and healthy life” (FAO ,2002). Food insecurity reflects uncertain access to enough and appropriate foods (Barrett, 2002). Focus on food security ensures that the basic needs of the poorest and most vulnerable groups are not neglected in policy formulation (Ajibola, 2000). One important aspect of the wealth of a nation is the ability to make food available for the populace. In this connection, food security therefore becomes an important factor in any consideration of sustaining the wealth of the nations (Osundare, 1999).

Considerable attention has been given to the study of food insecurity in developing countries however; there are relatively fewer empirical studies, in the literature, on the vulnerability of households to future food insecurity. Yet reducing vulnerability is a pre-requisite for achieving global and national food security targets (Lovendal and Knowels, 2005). Vulnerability to food insecurity refers to people’s propensity to fall or stay below a pre-determined food security line/status (Zeller, 2006). Vulnerability is a “forward looking” concept; it seeks to describe people’s prones to a future acute loss in their capacity to acquire food. Vulnerability ideas play an important role in predicting the onset of food crises. Vulnerability is a function of exposure to risks/shocks and the resilience to these risks. Risks/shocks are events that threaten households’ food access, availability and utilization and hence their food security status. These risk cause food insecurity by lowering food production, reduce income, reduce asset holding, increase indebtedness and reduce uptake of macro and micro nutrients. The poorest and most vulnerable are those most heavily reliant on agriculture, and most strongly locked into subsistence within agriculture. Vulnerability is linked to the uncertainty of events, everyone is vulnerable to food insecurity, but some more so than others. Vulnerability can be thought of as a continuum, the higher the probability of becoming food insecure, the more vulnerable one is (Lovendal and Knowels , 2005).

1.1 Statement of Problem

Sub-Saharan Africa is the most vulnerable region to food insecurity and Nigeria is one of the food deficit countries in sub-Saharan Africa (FAO, 2015). However, ensuring food security in developing countries is a global goal. Despite the relevance that food security is gaining over the years, several aspects remain under investigated (Santeramo, 2015). However, in spite of the efforts of national governments and the international community to reduce hunger and food insecurity in the context of the Millennium Development Goal’s (MDG’s) and other initiatives, the proportion of undernourished people in developing countries has been on the increase since the mid 1990’s (FAO, 2015). MDG progress assessment confirms that the developing world is particularly off track in achieving the goals closely linked to food and nutrition security (MDG 1c) of meeting the hunger reduction target by the end of year 2015 (FAO, 2015). Most of the research done in Nigeria in the past

has been mostly on determining the food security status of farm households. Earlier empirical studies have not adequately addressed the linkage between microcredit access and vulnerability to food insecurity.

Current socio- economic characteristics and exposure to risk determines household's future characteristics and their risk management capacity (Swain and Floro, 2012). While present characteristics are known by households and determines their current food security status, between the present and future, however, risks and shocks manifest and determine the future food security status depending on households risk management abilities. It is therefore important to identify households who are at risk of suffering in the future and becoming vulnerable to food insecurity (FAO, 2012). Microcredit is a risk management tool that improves household's ability to cope with potential shocks and thus reduces its vulnerability to food insecurity (Zaman, 2000). Microcredit is the extension of small loans given to borrowers who typically lack collateral, and enables the poor to undertake income-generating activities to improve their livelihoods. It has brought millions out of poverty and prompted economic sustainability bringing a host of impacts on families that receive it (Yunus, 2004).

Available statistics show that low average per capita food intake, as well as energy, constitutes perhaps the greatest obstacles to human and national development in Nigeria (Igene, 1997). The cost of inadequate diets to families and nations are considerably high. This includes increased vulnerability to diseases and parasites, reduced strength for task requiring physical effort, reduction of the benefit from schooling and training programs and general lack of vigour, alertness and vitality. The outcomes of these is a reduction in the productivity of people in the short and long terms, sacrifice in output and incomes, and increasing difficulty for families and nations to escape the cycle of poverty. Attempt to ensure food security can therefore be seen as an investment in human capital that will make for a more productive society. A properly fed, healthy, alert and active population contributes more effectively to economic development than one which is physically and mentally weakened by inadequate diet and poor health (Igene, 1997).

Pitt, Khandker and Cartwright (2003) observe that microcredit scheme play important role in poverty reduction, enterprise development, creating opportunity for savings, empowerment of vulnerable groups, promotion of gender equality, and the overall development of low-income persons in society. However, low incomes and the savings capacity of people in most developing countries are insufficient to finance farmers' investment in new technology. Therefore external capital (microcredit) is required to facilitate agricultural production which is dominated by small scale farmers, with small land holdings which makes their demand for credit small (Elhiraika, 1999). While it is well understood in Nigeria that financial exclusion of the rural population stunts development, fewer than two percent of rural households in Nigeria are estimated to have access to any sort of institutional finance (IFAD, 2006). The formal financial system provides services to about 35% of the economically active population while the remaining 65% are serviced by the informal financial sector (CBN, 2005). The failure of formal financial sector in most developing economies as Nigeria to serve the poor, has forced majority of rural farmers to rely on informal finance sources (Egbe, 2000; Ijere, 2000 and Udoh,2005).

Households make decisions in anticipation of or to mitigate the threat to its well being and one of such decisions is accessing finance. Access to microcredit improves the economic security of the recipients by providing them small loans to purchase productive assets thereby, reducing their vulnerability to food insecurity (Yunus, 2004). Considering the emergence of many credit programs and financial institutions in the Niger Delta region, and the dearth of research evidence as to what extent microcredit advanced to farmers reduced their vulnerability to food insecurity, necessitated this study. The study identified sources of microcredit accessed by farm households, assessed the vulnerability of microcredit beneficiary and non-beneficiary farm households in Niger Delta to food insecurity, and the

coping strategies adopted by these households against food insecurity. The attendant cost of collecting such data at the national level provides the basis for collecting this data at the regional level. This justifies the choice of Niger Delta Nigeria.

To prevent possible collapse of the amnesty process in the Niger Delta region and the people reverting to violence, as a result of perceived negligence, there is need for government to go back to the drawing board and look inwards into the agricultural sector of the economy. Investing in this sector by opening up access to microcredit will promote social cohesion and reconciliation, which constitutes the building blocks for sustainable peace. The outcome of this research will provide a platform form for decisions involving the region and the betterment of the life of its citizens, who are grossly affected by the grave economic situation in the area. Knowledge of the characteristics of those likely to be food insecure in the future and what could be done to reduce vulnerability could be of importance to government and relevant agencies in designing appropriate food security interventions.

1.2 Literature Review

Research has been carried out on household's vulnerability to food insecurity in the Nigeria and some other countries in Africa. Babatude, Omotesho, Olorunsanya and Owotoki (2008) in their study of determinants of vulnerability to food insecurity among male and female-headed households in Kwara state of North-central Nigeria found out that, off-farm income, total household income and available labour hours were significantly higher in male than female-headed households. Furthermore, farm size and crop output were significant in determining vulnerability to food insecurity in male-headed households. In the female-headed households, age, education of household's head and off-farm income were the significant determinants. In both the types of households, food expenditure, household size and number of labour hours were identified as significant determinants of vulnerability to food insecurity.

Thuita, Mwadime and Wangombe (2013) examined the effect of access to microcredit by women on household food security in three urban low income areas in Nairobi, Kenya. A total of 787 respondents comprising; 337 microcredit clients and 450 non clients participated in this study. Structured questionnaire was used to interview respondents in both groups. Findings showed that, households of microcredit clients consumed more nutritious and diverse diets compared to those of non-clients reflected in the dietary diversity scores for the two groups which were significantly different. Participation in microcredit programmes led to improved food security in the households of clients. The study provides evidence that access to micro finance credit influences household food consumption patterns positively in urban low income areas.

Welderufael (2014), carried out a study of determinants of household vulnerability to food insecurity in Ethiopia, results show that those households with large family sizes, lower consumption expenditure, old age, unemployed and male headed households were more food insecure in urban areas. Farm inputs, farm size, shocks such as drought and illness were the determinants of rural household vulnerability to food insecurity.

Asmamaw, Budusa and Teshager (2015), in their analysis of vulnerability to food insecurity in the case of Sayint district, Ethiopia, results indicated that livestock ownership and access to off-farm employment opportunities were the most significant determinants of a household's vulnerability to food insecurity.

Zaman (2000) studied the relationship between microcredit and the reduction of poverty and vulnerability, focusing on Bangladesh Rural Action Committee (BRAC), one of the largest microcredit providers in Bangladesh. Household consumption data from one thousand and seventy two (1072) households was used. Results showed that microcredit contributed to mitigating a number of factors that contribute to vulnerability. A number of pathways by

which microcredit can reduce vulnerability, (namely by strengthening crisis-coping mechanism, building assets and empowering women) were discussed. One channel is the asset-creation associated with series of loan financial investments. A household who has taken several loans would typically have focused its asset- building on the creation or expansion of one or more income earning assets and would have invested in improving living condition. Another channel through which credit reduces household vulnerability is through income and consumption smoothing. This occurs through the creation of non- farm sources of income as well as, by saving part of the loan disbursed for the lean season. This view was expressed by Schrieder and Sharma (1999) in their study of impact of finance on poverty reduction and social capital formation.

2. Materials and Methods

2.1 The Study Area

This study was conducted in the Niger Delta area of Nigeria. Nine Of Nigeria's constituent states makes up the region, namely; Abia, Akwa Ibom, Bayelsa, Cross River, Delta, Edo, Ondo, Imo, Rivers States, with an area of 112,000 sq. km, a population of 27 million people, 185 LGA's, about 13,329 settlements; 94% of which have populations of less than 5,000 Ichite (2015). The region has huge oil reserves and ranks sixth exporter of crude oil and third as world's largest producer of palm oil after Malaysia and Indonesia. Further, the Delta leads in the production of timber, pineapple and fish, also; cocoa, cashew, cassava, rice, yam and oranges are produced in large quantities in the area and the major occupation of the people is fishing and agriculture (Omafomwan and Odia, 2009).

Paradoxically, however, these vast revenues barely touch the Niger Delta's own pervasive poverty and food insecurity as few individuals, households and companies have access to financial resources. The post-amnesty programme for ex-militants in the Niger Delta was designed to address the challenge of youth restiveness. But, unfortunately, the amnesty programme only concentrated on those who bore arms instead of accommodating all persons from the oil bearing communities. But for most people, progress and hope much less prosperity remain out of reach (Oladipo, 2012).

The credit market in the Niger Delta is dualistic in nature with farm households and small scale agro-based producers relying on both formal and informal financial resources to fund production (Ministry of Niger Delta Affairs, 2011). Whereas the formal credit market is organized, basically under government supervision, the informal credit market is not organized with a lot of informality in its operations Essien and Idiong (2008). However, while there can be little doubt of the formal sectors superiority over the informal sector when it comes to financing large scale economic development and projects of national and regional importance, the role and strength of informal finance agents in small scale economies and their subsequent importance to low income households cannot be under-estimated (Srinivas, 1993).

2.2 Sampling Procedure and Sampling Size

Multistage sampling techniques were used. The first stage involved random selection of four out of the nine Niger Delta States; Abia, Akwa Ibom, Delta and Rivers States. Secondly, one agricultural zone out of three was randomly selected from each of the states except Akwa Ibom where two zones were selected out of six. Thirdly, two Local Government areas were selected by random sample from the states and four from Akwa Ibom. In the fourth stage, three communities were randomly selected from each Local Government Area giving a total of 30 communities. In the fifth stage, based on the list of crop farmers obtained from

the Agricultural Development Programmes in the states, sixteen (16) crop farmers stratified into beneficiaries and non-beneficiaries of microcredit schemes were randomly selected from each community to give a total of four hundred and eighty four (480) crop farmers. Out of this number, only three hundred and eighty four (384) supplied complete data that was used for the analysis. Data for this study was obtained from primary sources. Primary data was obtained through field survey using structured questionnaire and oral interview to elicit response from respondents.

2.3 Estimation Technique

Data collected were analyzed using frequency, percentage and vulnerability analysis as shown below.

2.3.1 Vulnerability Analysis

For each component of vulnerability, the collected data were then arranged in the form of a rectangular matrix with rows representing households' microcredit status and columns representing vulnerability indicators. Thus, vulnerability is potential impact (*I*) minus microcredit status (*MC*). This leads to the following mathematical equations for vulnerability:

$$V = f(I - MC) \tag{1}$$

	Indicators of Vulnerability				
	<i>I</i>	2	.	.	<i>K</i>
Beneficiaries (B)	<i>Xij1</i>	<i>Xij2</i>	.	.	<i>Xijk</i>
Non- beneficiaries (NB)	<i>Xij1</i>	<i>Xij2</i>	.	.	<i>Xijk</i>

The obtained data from all the estimated indicators as used in the study are normalized to be free from their respective units so that they all lie between 0 and 1. The household with the higher value corresponds to high vulnerability and *vice versa*. Hence, the normalisation was achieved using the methodology used by United Nations Development Program (2006) for assessing Human Development Index:

$$y_{ij} = \frac{Max\{X_{ij}\} - x_{ij}}{Max\{X_{ij}\} - Min\{X_{ij}\}} \tag{2}$$

Where: *Xij* represents the value of the vulnerability indicator for the farm household for *x* indicator.

Max. & *Min.* represents maximum and minimum values of indicators respectively for the variables of interest.

When equal weights are given for the vulnerability indicators, simple average of all the normalized scores is computed to construct the vulnerability index using:

$$VI = \frac{\sum x_{jl} + \sum x_{jk}}{K} \quad (3)$$

VI = represents the vulnerability indicator

K = represents the number of indicators used

After normalization, the average index (AI) for each source of vulnerability is worked out and then the overall vulnerability index is computed.

The vulnerability indicators that were used to measure the asset capacity of farm households in the study area include:

- X₁ = Years of Formal Education (in years)
- X₂ = Farm size (measured in hectares)
- X₃ = Ownership of land (dummy, 1= owned land, 0 = otherwise)
- X₄ = Remittance (Naira)
- X₅ = Household size (number of persons in the household)
- X₆ = Total farm income (in Naira)
- X₇ = Age of household head (measured in years)
- X₈ = Value of productive assets owned (in Naira).
- X₉ = Dependent Relatives (number of household members below 18 years of age)
- X₁₀ = Membership of cooperative (dummy, 1= member, 0= non-member)

3. Results and Discussion

3.1 Microcredit sources accessed by farm households in Niger Delta Nigeria.

The result presented in table 1 showed the microcredit sources accessed by farm households in Niger Delta region and, the most accessed sources of microcredit were: Cooperatives (36.03%), Esusu (20.24%) and Microfinance banks (10.93%). To avoid incurring much loss, most microcredit entities adopt the group solidarity approach (lending to farmers in cooperatives). This has to do with lending to a group of five to twenty- five individuals who are pursuing common economic objectives and micro enterprise activities. These groups provide joint guarantees of each other's loan. The essence of group selection will encourage the members of the group to have confidence in one another to the extent that access to credit for any member of the group will depend on the consent of all the members of the group. The group members share in the risk and benefits that are associated with the loan collected (Zeller, Sharma, Ahmed and Rashid, 2001 and Bullen, 2004).

Furthermore, in the Niger Delta region, the informal sources were the most patronized sources (73.77%) while the patronage of the formal sources was (26.31%). Udoh, (2005) noted that in agricultural financing, informal credit sources are unquestionably the most popular. The nature and operation of formal sources which have failed not only in promoting a viable delivery system has caused an increase in the patronage of informal credit sources by small scale farmers (Egbe, 2000). Informal sources according to Ijere (2000) are provided by traditional institutions that work together for the mutual benefits of their members. These institutions provide savings and credit services to their client.

Table 1. Percentage Distribution of Respondents According to Microcredit Sources Accessed.

Sn	Microcredit sources	Frequency	Percentage
1	Banks	27	10.93
2	Government	25	10.12
3	NGO	13	5.26
4	Esusu	50	20.24
5	Cooperative	89	36.03
6	Money lender	21	8.50
7	Friends,neighbours and relatives	22	9.00

Source: Computed from fieldurvey data 2014.

Note: * Multiple responses allowed

3.2 Vulnerability Analysis of Farm Households to Food Insecurity in Niger Delta Region.

Entries in table 2 showed the vulnerability analysis of farm households to food insecurity. Using education of the household head as an indicator, microcredit beneficiary households in the surveyed area had a vulnerability index of 0.40 while microcredit non- beneficiary households had a vulnerability index of 0.50. The implication of this finding is that microcredit non-beneficiary households are 50% vulnerable to food insecurity, while their microcredit beneficiary counterparts are not vulnerable. It could also mean that microcredit non-beneficiary households had low educational qualifications which could deny them opportunities to be employed in more remunerative jobs, which otherwise could assist them to be food secure. Osawe (2013) reported that poverty and vulnerability diminishes as one moves up the education ladder. Education can affect people’s standard of living through a number of channels: it helps skill formation resulting in higher marginal productivity of labour that eventually enables people to engage in more remunerative jobs. Highly educated people may have better coping abilities against future odds. Indeed, educated people may adapt more easily to changing circumstances, therefore showing greater ex-post coping capacity (Christiansen & Subbarao, 2004). Considering farm size, beneficiary households had a low vulnerability index of 0.54 compared to non-beneficiary households that had a high vulnerability index of 0.60. This indicates that beneficiaries operated more farm size in the area than non-beneficiaries; increasing farm size would reduce the risk of beneficiaries falling into food insecurity in the future (Babatunde *et al* 2008).

On the ownership of land for agricultural production, the vulnerability index of beneficiaries of microcredit was 0.48 while that of non-beneficiaries was 0.63. This is not unconnected to their access to microcredit which could have given them the financial empowerment to purchase land, and this made them less vulnerable to food insecurity. Birungi and Hassan (2010) reported that land tenure security increases the probability of investment in land management hence, reducing vulnerability. Regarding remittance, the survey showed that microcredit beneficiaries had a vulnerability index of 0.35 and non-beneficiaries had a vulnerable index of 0.58. Remittance makes a difference in households’ living standards as, household receiving remittances fared much better that household not receiving any remittance. Yang and Martinez (2005) support this finding. Considering household size, beneficiaries of microcredit had a vulnerability index of 0.54 and non-beneficiaries had a vulnerability index of 0.46. Babatunde, Owotoki, Heidhues and Buchenrieder (2007) said that households become more vulnerable to food insecurity as their household size increases.

Table 2. Vulnerability Analysis of farmers to food insecurity in Niger Delta Nigeria.

Sn	Vulnerability Indicators	Status	Abia		Akwa Ibom		Delta		Rivers		Average	
			Actual Value	Vul. Index	Actual Value	Vul. Index	Actual Value	Vul. Index	Actual Value	Vul. Index	Actual Value	Vul. Index
1	Education	B	11.92	0.18	10.00	1.00	12.33	0.00	11.38	0.41	11.40	0.40
		NB	10.88	1.00	11.54	0.57	12.42	0.00	11.75	0.43	11.65	0.50
2	Farm Size	B	2.63	0.47	2.60	0.69	2.70	0.00	2.56	1.00	2.62	0.54
		NB	2.30	1.00	2.73	0.00	2.47	0.61	2.38	0.81	2.50	0.60
3	Land Ownership	B	0.52	0.58	0.44	1.00	0.63	0.00	0.56	0.37	0.54	0.48
		NB	0.44	0.90	0.63	0.00	0.42	1.00	0.50	0.62	0.50	0.63
4	Remittance	B	0.46	0.00	0.40	0.24	0.21	1.00	0.42	0.16	0.37	0.35
		NB	0.69	0.00	0.52	0.81	0.58	0.52	0.48	1.00	0.56	0.58
5	Household Size	B	4.79	0.68	5.60	0.00	5.04	0.47	4.40	1.00	2.15	0.54
		NB	5.35	0.48	5.75	0.00	5.46	0.35	4.92	1.00	1.83	0.46
6	Total Farm Income	B	329904	0.00	302854	0.45	311354	0.31	269791	1.00	303476	0.44
		NB	268343	0.74	314312	0.00	296333	0.29	252500	1.00	886645	0.50
7	Age	B	42.88	0.45	47.17	0.00	37.54	1.00	43.90	0.34	42.87	0.45
		NB	38.44	0.84	48.23	0.00	36.60	1.00	43.50	0.41	41.69	0.56
8	Asset Value	B	514208	0.00	482916	0.19	346208	1.00	391666	0.73	433750	0.48
		NB	452500	0.34	396250	0.75	362645	1.00	499687	0.00	427770	0.52
9	Dependent Relatives	B	2.00	1.00	2.88	0.00	2.52	0.41	2.06	0.93	2.37	0.59
		NB	2.23	1.00	2.98	0.12	3.08	0.00	2.58	0.59	2.72	0.43
10	Co-Operative Membership	B	0.67	0.19	0.48	0.80	0.73	0.00	0.42	1.00	0.54	0.50
		NB	0.02	1.00	0.02	1.00	0.08	0.00	0.02	1.00	0.04	0.75
	Mean Vulnerability Index			0.54		0.38		0.44		0.69		0.51

Source: Computed from field survey data 2014.

Note: Beneficiaries vulnerability index = 0.47, Non-beneficiaries vulnerability index = 0.55

For total farm income, the vulnerability index of beneficiaries was 0.44 while that of non-beneficiary households was 0.50. This implies that vulnerability to food insecurity decreased as farm income increased. Fofana (2006) supports this finding. He conducted an empirical analysis of micro finance institutions, and a survey analysis applied to cross-sectional data collected from 185 women who had access to credit from microfinance institutions and, 209 women who had no access to microfinance credit. The results showed that microfinance credit increased the income of female borrowers and improved the level of farm production which is a main development goal in most African countries whose economies are based on the agricultural sector. Regarding age, beneficiaries had a vulnerability index of 0.45 and non-beneficiaries a vulnerability index 0.56. Age of household head appears to make a difference in vulnerability status as age increases vulnerability Babatunde, *et al* (2008). In terms of asset value, beneficiary households had a vulnerability index of 0.48 while the non-beneficiary households had a vulnerability index of 0.52. Households that have low asset value are more likely to be poor and food insecure with higher level of vulnerability Bebbington, (1999).

Using dependent relatives, beneficiary households had a vulnerability index of 0.59 and non-beneficiary households had a vulnerability index of 0.43, households become more vulnerable as dependency ratio increases. Whitehead (2002) noted that households with more adult members had lower vulnerability and poverty status than those with few adult members, implying that households demonstrating higher dependency ratios are more vulnerable from a food security standpoint. Vulnerability threshold on co-operative membership indicated that beneficiary households had a vulnerability index of 0.50 than their non-beneficiary counterpart who had 0.75. This indicates that beneficiary households had more social ties than their counterparts. Through cooperatives, farmer members share information, have more access to agricultural inputs, technologies and training from extension agents thus reducing vulnerability to food insecurity Amusa, Okoye and Enete, (2015).

Vulnerability indicators gives information on the processes or interventions implemented to target food security or with the determinants or sources of risk associated with food security Santeramo (2015). The vulnerability indicators among microcredit beneficiary and non-beneficiary households in the study area, showed high level of vulnerability among non-beneficiary households (0.55), while beneficiary households (0.47) were not vulnerable. The vulnerability of non-beneficiary households is not surprising as; results from a study conducted by Zaman (2000) on the relationship between microcredit and the reduction of poverty and vulnerability, showed that microcredit reduces vulnerability by; strengthening crisis-coping mechanism, building assets and providing emergency assistance during natural disasters. Having access to microcredit, improves a borrowing households ability to cope with potential shocks, thus reducing its vulnerability to poverty and food insecurity (Weiss and Montgomery (2005) and Morduch, 1998).

The State based analysis shows that Rivers and Abia States respondents were vulnerable with 0.69 and 0.54 level of vulnerability respectively, while Akwa Ibom and Delta States respondents were not vulnerable with 0.38 and 0.44 level of vulnerability. This finding therefore showed that, beneficiaries of microcredit in the Niger Delta region were less vulnerable to food insecurity than non-beneficiaries. The mean vulnerability index was 0.51; this suggested that the surveyed farm households in Niger Delta, Nigeria were 51% more likely to be vulnerable to food insecurity. Thuita, Mwadime and Wangombe (2013) support this finding. Results of their findings show that, participation in microfinance programmes led to improved food security in the households of clients. Swain and Floro (2012) in assessing the effect of microfinance on vulnerability and poverty among low income households in India said that, borrowing improves economic welfare via increased income and consumption. It prevents households from falling into food insecurity and poverty and

enables them to meet their survival needs, make productive investments and avoid selling their limited resources in times of income or expenditure shocks. Lovendal and Knowles (2005), Cohen and Sebstad (2000) also share similar views.

3.3 Coping Strategies against Food Insecurity

Table 3 showed the coping strategies adopted by farm households against food insecurity. The result showed that majority of the respondents (67.45%) occasionally bought food on credit, 57.03% ate once a day, 45.57% sold their assets and 18.49% allowed their children to eat first. Idrisa, Gwary and Shehu, (2008), Ibok (2012) and Carletto, Zezza and Banerjee, (2013) support this findings saying that, these strategies are common behavioural responses to food insecurity that are used for the management of household food shortages, based on their best judgement of the situation, they are reliable indicators of dietary inadequacy and good predictors of food vulnerability. The survey questionnaire did not include all identified coping strategies because some of them would have offended the respondents or would have been met with resistance and as such were removed from the list.

Table 3. Percentage Distribution of Respondents According to Coping Strategies Adopted Against Food Insecurity.

Coping Strategy	Very Often (%)		Occasionally (%)		Regularly (%)		Never (%)	
	B	NB	B	NB	B	NB	B	NB
Allowing Children to eat first	18.54	28.34	5.17	13.32	16.11	18.00	0.30	0.22
Eating wild fruits	0	0.26	6.21	6.55	0.21	1.35	60.95	24.47
Selling assets	1.1	0.46	22.69	22.88	2.85	2.10	17.00	30.92
Buying food on credit	0.80	1.28	31.33	36.12	1.20	2.71	16.13	10.43
Picking leftover food at social functions	0.10	0.16	2.63	4.66	0.09	1.21	41.15	50.00
Eating once a day	3.70	4.89	43.22	13.81	5.50	3.09	15.39	10.40

Source: Computed from field survey data 2014.

Note* Multiple responses allowed, B = beneficiaries, NB= no Beneficiaries

4. Conclusion and Recommendations

The paper assessed food insecurity vulnerability status of farm households in Niger Delta, Nigeria. Results of the study indicated that, the most accessed sources of microcredit were: Cooperatives (36.03%), Esusu (20.24%), and Microfinance banks (10.93%). Furthermore, in the Niger Delta region, the informal sources were the most patronized sources (73.77%) while the patronage of the formal sources was (26.31%). The vulnerability indicators among microcredit beneficiary and non- beneficiary households showed a high level of vulnerability among non-beneficiary households (0.55), while beneficiary

households (0.47) were not vulnerable. The State based analysis shows that Rivers and Abia States respondents were vulnerable with 0.69 and 0.54 level of vulnerability respectively, while Akwa Ibom and Delta States respondents were not vulnerable with 0.38 and 0.44. The coping strategies adopted against food insecurity included buying food on credit, allowing children to eat first, selling of assets, eating once a day and eating wild fruits. To reduce farm households' vulnerability to food insecurity situation in the area, the study recommends that; the scope of microcredit should be expanded and the volume increased. Farmers should be encouraged to engage in other income generating activities as the coping strategies used, only have short term effect. This paper is based on a sample of farm households in a region therefore; other researchers could collect data using larger samples from other regions in Nigeria on the food insecurity vulnerability status of beneficiaries and non-beneficiaries of microcredit schemes.

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