

Farming Households' Vulnerability to Risk in the Northern Region of Oyo State, Nigeria

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KEYWORDS Farming household; vulnerability to risk; food consumption; socioeconomic variables

ABSTRACT This study assessed the extent of farming household vulnerability to risk in the Northern region of Oyo state. The multistage random sampling procedure was used in selecting 107 respondents from total sample frame of farmers supplied by the Agricultural Development Programme of Oyo state. The study employed the Ordinary Least Square Estimates analytical technique. From the result it is evident that employment shock had significant effect on food expenditure than non-food expenditure, while wage arrears had no significant effect on food and non-food consumptions. The null hypothesis was therefore rejected, thereby suggesting that farming household in the study area do not enjoy complete insurance with respect to food consumption and are thereby vulnerable to economic shocks. Findings also revealed household working status, age of household head, Educational Status of household head as key observable socioeconomic variables that determine the extent to which household are vulnerable to risk or economic shocks. Consequently, this study recommends that poverty alleviation programmes in Nigeria should address the consumption smoothing capabilities of farming households

1. INTRODUCTION

1.1 Problem Statement

The term vulnerability has come to be widely used in recent years alongside poverty in discussions of social protection policy. The term vulnerability has also been severally given so many meanings by researchers. Chauduri (2000) defined vulnerability as the ex-ante risk today that a household will, if currently poor, remain poor, or if currently non-poor will fall below the poverty line next period. Building on recent literatures of consumption smoothing and risk-sharing, vulnerability to risk was defined by Skoufias (2002) as the degree to which the growth rate of household consumption covaries with the growth rate of household income. This definition of vulnerability explicitly acknowledges that households may adopt a variety of risk management strategies such as savings and loans to protect themselves from such risk. A World Bank (2001) study on risk management in South Asia however defined vulnerability as "the likelihood of being adversely affected by a shock that usually causes consumption levels, or other factors that affect well being to drop. Quisumbing (2002) used both consumption smoothing definitions as well as the link between consumption smoothing and ex-post impact of shocks as measures of vulnerability.

Regardless of the different types of definition put forward, it is clear that the term vulnerability

deals proactively with the problems of households to risk. The term vulnerability is therefore different from the static concept of welfare studies since the static concept is an ex-post measure of household's well being, while vulnerability is an ex-ante analysis of a household's well being.

Various social protection literatures acknowledge risk as an uncertain event (shocks) that can lead to welfare losses. Risks can also be individual specific or idiosyncratic (illness, loss of job, accidents), community specific or locally covariate (flood, landslides, gang violence) and national specific or nationally covariate (war, financial crisis and coup).

Okunmadewa (2003) identified some types of risk in Nigeria to include natural risk, environmental risk, gender risk, conflict and crime risks. Others are labour market risk, life events risk and macroeconomic risks. The risk management strategies used in Nigeria includes prevention, mitigation and coping strategies. Prevention strategies seek to reduce the probability of welfare reducing risk through activities such as education, immunization, irrigation and extension services. Mitigation strategies seeks to decrease the impact of a future welfare reducing risk through activities such as insurance policy, crop diversification, mixed farming, storage programme and price support, while coping strategies relieve the impact once the risk (the event) has occurred. Examples of coping strategies include sales of assets, reducing consumption, taking

children out of school and borrowing. (Olaniyan et al., 2003). Key risk management arrangements in Nigeria as identified by Adubi et al. (2002) include informal, (social network and informal savings groups) and formal private (public education and social safety net).

Granted that different risk management strategies and arrangements exist in Nigeria, there however exist gaps in knowledge with respect to how Nigerians in the rural areas manage risk. Alayande (2003) identified rural Nigerians (especially farming households) as the most vulnerable in terms of shocks to their well being. This study however failed to unmask farming household's extent of vulnerability to shocks or risks. In line with this reasoning, this study is interested in analysing farming household's vulnerability to risk among farming households in the Northern region of Oyo State. The lack of knowledge about the extent of farming household's vulnerability to economic shocks in the study area brings up the following central questions of this study. . Which specific groups of farming households defined by observable characteristics is most vulnerable to risks? Can farming households protect their consumption against income and unemployment shocks? Answers to these questions would add to the required information base in understanding how rural farming households manage risks in the study area.

1.2 Objectives of the Study

The main objective of this study is to examine farming households' extent of vulnerability to risk in the Northern region of Oyo State. The specific objectives are to

- assess the extent to which farming households manage to protect their consumption from income shocks and
- isolate Socio-economic characteristics that makes households vulnerable to economic shocks

1.3 Hypotheses

The two research hypotheses tested in the study are stated in the null forms as follows:

H_0 : Idiosyncratic shocks have no role in explaining household change in consumption

H_0 : Household head observable characteristics has no role in explaining household change in consumption

2. LITERATURE REVIEW

2.1 Risk, Risk Exposure and Vulnerability

Vulnerability is a dynamic concept. It suggests the response to changes overtime. Vulnerability is the resultant possibility of a decline in well-being. The event propelling the decline is often referred to as a shock, which affects individuals (e.g. illness, death) a community, a region, or even a nation (e.g. natural disaster, macroeconomic crisis).

Risk, risk exposure and vulnerability are closely related but not synonymous (see World Bank, 2001). Risk refers to uncertain events that are not well-being friendly. Risk exposure captures the probability that a certain risk will occur. Vulnerability measures the resilience against a shock, suggesting the likelihood that a shock will result in a decline in well-being. Technically therefore, vulnerability can be said to be a function of a household's assets endowment and insurance mechanisms, as well as the characteristics of the shock, which can be underlined by how severe or frequent they are whenever they occur (World Bank, 2001).

Since vulnerability is often described in terms of risk exposure, literature has identified various sources of risk. Risks are classified by the level at which they occur and by the nature of the event behind them. There are three sets of risk based on level of occurrence. These are the micro, meso and macro shocks (Fafschamps, 1999). Micro shocks are idiosyncratic, in that they are individual or household level specific. Meso-shocks affect groups of households that make up the community or village. Macro shocks occur at national or international level. The other conventional approach to classifying shocks is the severity and frequency of shocks. Severity of shocks range from catastrophic (a natural disaster, death of the breadwinner) to minor ones like a slight illness, a few days without work for casual labourers among others (Deaton 1991).

Vulnerability is multidimensional, and poor households face a number of risk. As earlier hinted, the poor are faced with natural shocks such as harvest failure, health related shocks and macro-level shocks such as internal community strife as a result of land dispute. The aggregation of these different shocks is a source of significant stress for households. The major puzzle remains the effectiveness of household response to

economic shocks. This puzzle is one of the major information gaps to be supplied by this study.

Recent studies by Holzmann (2000) and World Bank (2000) endorsed the classification of responses to risk into three, namely risk reduction strategies, risk mitigation strategies and coping strategies. The first two are essentially ex-ante strategies as they represent measures that are embarked upon in anticipation of a shock. Coping strategies are essentially ex-post strategies as they seek to offer relief after a shock might have occurred. Another major contribution of this study in line with the above stated classification is that it will use the ex-ante strategy in studying responses to risk among farming households. Till date, analyses of farming households' responses to risk have been limited to ex-post strategies (see Adubi (1992), Umoh and Adegeye, (2000). However, ex-ante strategies of studying households' response to risk have been empirically demonstrated in the works of Skoufias (2002), Schechter (2001) and Ligon (2001). However, most of these studies were carried out in European and Asian countries, whose demographic and cultural characteristics differ from those of Nigerians. A response to risk study that make use of the ex-ante analytical strategy within the Nigerian farming household context will be quite an immeasurable contribution to the body of knowledge.

2.2 Theoretical Framework

Hoddinolt and Quisumbing (2003) identified three approaches to assessing vulnerability. These are vulnerability as expected poverty (VEP), vulnerability as low expected utility (VEU) and vulnerability as uninsured exposure to risk (VER). According to the authors, these three approaches share a common characteristic since each of them constructs a model that predicts a measure of welfare. Further VEP and VEU shares two characteristics viz: they make reference to benchmark for the welfare indicator and enunciate a probability of falling below this benchmark. VEP and VEU approaches measure vulnerability at individual level, summing over all individuals or households give a measure of aggregate vulnerability. However, VER according to Hoddinott and Quisumbing do not measure vulnerability because they do not construct probabilities. Instead, VER assess whether observed shocks generate welfare losses.

Arising from the advantage stated in favour of the VER approach, this study adopts the VER approach as its theoretical framework. This is so since VER assess whether observed shocks generate welfare losses through the use of panel data.

3. METHODOLOGY

3.1 Study Area

The Northern region of Oyo State is basically regarded as the "Food basket" of Oyo State. The area enjoys the services of the Oyo State Agricultural Development Project (OYSADEP). The Oyo North Agricultural zone coincides with the Saki zone, one of the four zones under the OYSADEP, (Ajani, 2002). Although the Northern region of Oyo State has agriculture as its main traditional occupation, it also has trade and crafts as some of its secondary occupations. Food and cash crops cultivation are favoured by the climate of Northern region of Oyo State. The food crops planted in the Northern region of Oyo State include yam, maize, cassava, cowpea, sorghum, soybeans, and okro. Others include pepper, groundnut, guinea corn melon, while the cash crops include cocoa and oil-palm.

Oyo State in which Oyo North is situated is located between 7°3' and 9° 12' North of the equator and longitudes 2°47' and 4° 23' East of the meridian. There are two distinct seasons namely the wet and dry seasons in Oyo State. These two distinct seasons also explain why farming households in the state experience off harvesting season and peak harvesting season (Adegeye, 1998).

The rainfall pattern is remarkably constant ranging between 1,211mm at Kishi in the far Northern region of the state to 1,204mm at Ibadan in the Southern part of the state over the past two decades. Mean temperature is 27°C while sunshine hours per day in the state capital ranges from 2.4 hours in August to 7 hours in February (John, 2003).

3.2 Data Sources/Method of Data Collection

The main source of data for this study is the primary data. The primary data collection involved designing questionnaire on household socio-economic and demographic characteristics, safety net/social capital issues and shocks

suffered by households in recent time. Data were collected during two seasons. The peak harvesting season and the off peak harvesting season.

3.3 Sampling Procedure and Data Type

The multistage random sampling technique was chosen for this study. The first stage involved the random selection of six out of the ten local government areas that constitute Oyo North. These are Saki West, Atisbo, and Irepo local government areas. Others are Kajola, Itesiwaju, and Iwajowa local government areas. At the second stage, three local government areas were randomly selected for the study. These are Kajola, Atisbo and Saki West local government areas. In the third stage, farming households were randomly sampled from each of the three local government areas. The study could achieve this task because it selected farming households from the Agricultural Development Project sample frame. As a result of the knowledge of sampling frame, the local government farming households were sampled proportionately to size. Therefore 31, 40 and 36 farming households were randomly interviewed in the Kajola, Atisbo and Saki West Local Government Areas of Oyo North respectively. Therefore, this study collected information from 107 farming households. It should be noted that panel data is the most ideal for social protection studies, since literature have confirmed that a thorough vulnerability study must collect data from respondents at two different periods (see Chauduri, 2000 and Skoufias, 2002). These visitations took place during the off peak harvesting and peak harvesting seasons. Panel data is normally used for vulnerability study because it allows for precise estimation of changes in variable means and also because they provide accurate data on past events.

3.4 Analytical Framework

The theoretical model guiding this empirical analysis is based on the consumers' optimization problem in the context of a complete market for state contingent commodities. The assumption of a complete market for state contingent commodities may be considered as a simple approximation to all the formal and informal arrangements across space and overtime that households can enter into in order to protect themselves from

risk. According to Skoufias (2002), households are assumed to purchase state contingent commodities so as to maximize

$$V^h = \sum_{s=1}^S \sum_{t=1}^T \pi_s v_t(C_{st}^h) = \sum_{s=1}^S \sum_{t=1}^T \pi_s (1+\delta)^{-t} v(C_{st}^h) \quad \text{Equation (1)}$$

Where $v_t(C_{st}^h)$ is the period-specific "felicity" function of household h in period t as a function of its consumption in state s and in period t , assumed to be discounted to the present by the subjective discount rate δ , and π_s is the probability of states (assumed to be the same for all households). With the ability to buy in period 1 a unit of consumption in state s at time t for $P_{st}(1+\gamma)^{-t}$, and assuming that household h has initial assets, A^h and labour income in period t and state s , denoted by Y_{st}^h , the lifetime budget constraint of household h can be expressed as

$$\sum_{s=1}^S \sum_{t=1}^T P_{st} C_{st}^h (1+r)^{-t} = A^h + \sum_{s=1}^S \sum_{t=1}^T P_{st} Y_{st}^h (1+r)^{-t} \quad \text{Equation (2)}$$

Thus, the existence of the market in contingent claims allows the problem to be written as the maximization of expected utility subject to an expected value budget constraint. The first order optimization condition for equation (1) subject to (2) with the associated Lagrange multiplier for household h , denoted by θ^h is

$$\lambda_t = (C_{st}^h)^{-1} v_t(C_{st}^h) = \theta^h \frac{1+d}{1+r} \frac{P_{st}}{P_s} = \theta^h \mu_t \quad \text{Equation (3)}$$

Where

$$\mu = \left[\frac{1+\delta}{1+r} \right]^t \frac{P_{st}}{\pi_s}, \text{ and } \lambda_t(C_{st}^h) \text{ is the marginal}$$

utility of consumption in period t . Thus, the main implication is that the marginal utility of consumption has a two factor structure, consisting of a household specific component θ^h and a time-specific component μ_t .

Given a specific functional form for the felicity function such as an isoelastic utility function $v(C_t) = 1/(1-p) C_t^{1-p} f(Z_t)$ where $f(Z_t)$ is a function allowing for the influence of time varying taste factors, equation (3) may be expressed after Logarithmic transformation as

$$\ln C_t^h = -p^{-1} (\ln \theta^h - \ln f(Z_t) + \ln \mu_t)$$

Which after first differencing over time yields

$$\Delta \ln C_t^h = -p^{-1} (-\Delta f(Z_t) + \Delta \ln \mu_t) \quad \text{Equation (4)}$$

Equation (4) implies that the growth rate in household consumption between time $t-1$ and t after controlling for the influence of time varying taste factors, is a function only of the growth rate in aggregate shocks summarized by the term $-p^{-1} (\Delta \ln \mu_t)$. The version of ϕ equation 4 that is

more commonly encountered in the literature is of the form.

$$\Delta \ln C_{htv} = \delta_{iv} \delta_{iv} (D_{iv}) + \beta \Delta \ln Y_{htv} + \gamma X_{htv} + \Delta \varepsilon_{htv} \quad \text{Equation (5)}$$

Where $\Delta \ln C_{htv}$ denotes the change in log consumption or the growth rate in total consumption per capita of household h , in period t (i.e. between round t and round $t-1$, in community v , $\Delta \ln Y_{htv}$ is the growth rate of income, X is a vector of household or household head's characteristics, δ, β , and γ are parameters to be estimated, $\Delta \varepsilon_{htv}$ is a household-specific error term capturing changes in the unobservable components of household preferences and D_{iv} denotes a set of binary variables identifying each community separately by survey round.

The relations between the change in consumption and growth rate in income *a priori* wise is expected to be positive. The β parameter will provide estimate of the extent to which idio-syncratic income changes play a significant role in explaining the household-specific consumption growth rate. The *a priori* expectation in terms of change in consumption of household and household's head characteristics is also positive. The sign and size of parameter will identify the extent to which there is higher or lower co variation between income and consumption changes in the group of households with specific characteristic relative to households without the reference characteristics.

The basic analytical model used for this study is the ordinary least square estimates used in estimating change in consumption with respect to change in income and some socio-economic characteristics.

The explicit forms of the various equations used to capture the objectives are as presented below:

Objective 1

$$\Delta \ln C_{htv} = \sum_{iv} \delta_{iv} (D_{iv}) + \beta \text{shock}_{htv} + \gamma X_{htv} + \Delta \varepsilon_{htv} \quad \text{Equation (6)}$$

In this regression, the change in income is replaced by the binary variable shock denoting the incidence of a household idiosyncratic shock between period t and period $t+1$. In this manner, one is able to identify whether the incidence of shock has a significant negative impact on the growth rate of household consumption from period to period. For example employment shock is operationalized as experienced any form of illness in the last three month = 1, 0, otherwise. The other key variables used as explanatory variables include age, age squared, household head working status, educational status of

household head, Household location, wage arrears, and household size. Specifically, with respect to wage arrears if the household report that it is being owed or that it has not received payment in lieu of farming produce sold during the peak and non-peak harvesting periods, then the shock variable takes the value 1 and 0 otherwise. D represents location dummy.

Objective 2

$$\Delta \ln C_{htv} = \delta_{iv} \delta_{iv} (D_{iv}) + \beta \Delta \ln Y_{htv} + \gamma Z + \delta (Z' \Delta \ln y_{htv} + \gamma X_{htv} + \Delta \varepsilon_{htv} \quad \text{Equation (7)}$$

Z is the binary variable identifying households with a particular observed characteristic. Equation 7 above will identify the extent to which there is higher or lower co-variation between income and consumption changes in the group of households with specific characteristic. The t -value associated the coefficients will allow one to test whether this difference is significant. All other definitions of variable of symbols are still similar to their previous definitions. The key variables used as explanatory variables include Age, Age Squared, Household head working status, Educational status of household head, Household location, and Household size. Others include change in income, poverty status of household in round 1, poverty status of household in round 2, interaction between change in income and vulnerability status of household and farm size of households.

4. RESULTS AND DISCUSSION

This section seeks to provide empirical evidences on the extent to which farming households are vulnerable to risk in Northern region of Oyo State. In the process of achieving this broad objective, the study assessed the extent to which farming households manage to protect their consumption from income shocks. It equally determined whether specific groups of farming households with defined observable characteristics are more or less vulnerable to risk of high fluctuation in their consumption profile. Findings from analysis conducted on the specific objectives of this study are presented as follows

4.1 Assessing the Extent to Which Farming Households Manage to Protect Their Consumption from Income Shocks.

This section of the study sets out to inves-

tigate whether consumption of farming household is insured against economic shock (i.e. wage arrears and unemployment shocks). Following Skoufias (2002), other socioeconomic variables used simultaneously along with the economic shock are age, age squared and household head working status. Others include educational status of household head, and household size. Under the null-hypothesis, complete insurance is assumed, $\beta = 0$, since idiosyncratic shocks is hypothesized to have no role in explaining household change in consumption.

The results of the estimates of economic shocks and socio-economic variables with respect to households change in real per capita food consumption and households change in real per capita non-food consumption are presented in Tables 1 and 2. The result from Table 1 shows that wages arrears and employment shock, both economic shock variables, carried positive coefficient signs with respect to change in real per capita food consumption of respondents. The sign of wage arrears implies that as wage arrears of household increases, so will the fluctuation in food consumption increase. However, the wage arrears variable was not significant. The employment shocks variable which manifest in form of illness was significant at five percent level. This result therefore implies that employment shocks could lead to bringing about wide change in real per capita food consumption of household members in the study area. This result suggests that farming household in the study area are able to insulate their food consumption from wage arrears shock but are not able to insulate their food consumption from employment shock manifested in form of illness experienced by working age household members. The null hypothesis is therefore rejected, thereby suggesting that farming household in the study area do not enjoy complete insurance with respect to food consumption. The impact of these two shocks (wage arrears and employment shocks) on change in real per capita non-food expenditure is not clearly visible. This is so, since none of these two variables significantly impact on change in non-food consumption of respondents in the study area. The result clearly shows that households are able to insulate their non-food consumption from shocks such as delayed wage payment and illness as implied by the extreme version of the consumption insurance hypothesis (see Table 2). This is so since few respondents reported

Table 1: The impact of idiosyncratic shocks on household consumption

<i>Δ In Real Per capita Food Expenditure (dependent variable)</i>		
<i>Variable</i>	<i>Coefficient</i>	<i>Prob-value</i>
Constant	1.420 (0.638)	0.285
age (years)	-7.45 x 10 ⁻² (0.218 x 10 ⁻¹)	0.733
age ² (years)	-0.119 x 10 ⁻³ (0.246 x 10 ⁻³)	0.630
household-head working status (dummy)	-0.505** (0.259)	0.050
educational status (years)	0.124 (0.125 x 10 ⁻¹)	0.323
household location (dummy)	-0.145 (0.121)	0.234
wage arrears (naira)	0.168 (0.152)	0.271
employment shock (dummy)	0.372** (0.167)	0.026
household size (number)	-0.141 (0.197 x 10 ⁻¹)	0.476
R ² = 0.155 Adjusted R-Square = 0.085		
Model test: F (8, 97) = 2.22		
Prob Value = 0.032		

Source: Results from field survey 2005

*** Significant at 1 percent; ** Significant at 5 percent; * Significant at 10 percent

Table 2: The impact of idiosyncratic shocks on household's non-food consumption

<i>Δ In Real Per Capita Non-Food Expenditure (Dependent Variable)</i>		
<i>Variable</i>	<i>Coefficient</i>	<i>Prob-value</i>
Constant	1.459** (0.715)	0.045
age (years)	-0.332 (0.245 x 10 ⁻¹)	0.179
Age2 (Years)	0.290 (0.277 x 10 ⁻³)	0.297
Household-Head Working Status (Dummy)	-0.228 (0.291)	0.434
Educational Status (Years)	0.441*** (0.104 x 10 ⁻¹)	0.002
Household Location (Years)	-0.127 (0.136)	0.3554
Wage Arrears	0.206 (0.170)	0.2308
Employment Shock (Years)	0.227 (0.185)	0.9026
Household Size (Number)	-0.158 (0.221 x 10 ⁻¹)	0.4763
R ² = 0.184 Adjusted R-Square = 0.117		
Model Test: F (8, 97) = 2.74		
Prob Value : 0.009		

Source: Results from field survey 2005

*** Significant at 1 percent; ** Significant at 5 percent; * Significant at 10 percent

that they experience wage arrears in the study area. The study went further to assess the effect of economic shocks on change in total real per capita expenditure profile of respondents. The results presented in Table 3 shows that none of the economic shock variables significant impact on change in total real per capita expenditure of respondents. It should however be noted that two socio-economic variables significantly impact on households total consumption expenditure. These are household head working status and respondents' educational status.

Overall, there exist clear evidences that employment shock had significant effect on food expenditure than non-food expenditure while wage arrears have no significant effect on food and non-food consumptions. The two economic shock variables (wage arrears and employment shocks however had no significant impact on total consumption expenditure of respondents

Table 3: The impact of idiosyncratic shocks on household's total consumption

<i>Δ In total Real Per Capita Expenditure (Dependent Variable)</i>		
Variable	Coefficient	Prob-Value
Constant	2.879*** (1.061)	0.008
Age (Years)	-0.406 X 10 ⁻¹ (0.363 X 10 ⁻¹)	0.265
Age (Years)	-0.406 X 10 ⁻¹ (0.363 X 10 ⁻¹)	0.265
Age2 (Years)	0.171 X 10 ⁻³ (0.409 X 10 ⁻³)	0.677
Household-Head Working Status (Dummy) Farming =1, Non-Farming=0	-0.7440* (0.437)	0.088
Educational Status (Years)	0.565 x 10 ⁻¹ *** (0.207 x 10 ⁻¹)	0.008
Household Location (Dummy) (Rural =1, Semi-Urban = 0)	-0.272 (0.201)	0.181
Wage Arrears (Naira)	0.374 (0.252)	0.142
Employment Shock (Dummy) (Yes = 1, No = 0)	0.395 (0.273)	0.153
Household Size (Number)	0.299 x 10 ⁻¹ (0.327 x 10 ⁻¹)	0.363
R ² = 0.223 Adjusted R-Square = 0.158		
Model Test: F (8, 97) = 3.48		
Prob Value : 0.001		

Source: Results from field survey 2005

*** Significant at 1 percent ** Significant at 5 percent

* Significant at 10 percent

4.2 Assessing the Effect of Household Head Observable Characteristics on Food and Non-Food Consumption Expenditures

In an effort to examine whether certain observable characteristics of household head could affect the change in consumption of households in the study area, this analysis was carried out. The key variables considered are poverty status of households in the two rounds of survey, location status of households (rural or semi urban) Vulnerability status of households interacting with change in household income, household size, farm size of household and educational status of household head. Others include age of household head and household head working status.

Table 4: The effect of household head observable characteristics on per capita food expenditure

<i>Δ In Real Per Capita Food Consumption</i>		
Variable	Coefficient	Prob-Value
Constant	1.607** (0.665)	0.017
Age	-0.126 x 10 ⁻¹ (0.226 x 10 ⁻¹)	0.201
Age ²	-0.150 x 10 ⁻¹ (0.254 x 10 ⁻³)	0.579
Household Head Working Status (Dummy)	-0.387 (0.268)	0.953
Educational Status (Years)	0.109 x 10 ⁻¹ (0.127 x 10 ⁻¹)	0.394
Household Location (Dummy)	-0.168 (0.130)	0.201
Δ Ln Income Among Household (Naira)	-0.446 x 10 ⁻³ (0.635 x 10 ⁻³)	0.484
Poverty Status Of Household In Round 1 (Dummy)	-0.125 (0.160)	0.438
Poverty Status Of Household In Round 2 (Dummy)	-0.250* (0.144)	0.085
Vulnerability Status Of Household	0.214 x 10 ⁻⁶ (0.129)	0.869
*Change In Household Income (Naira)	-0.808 x 10 ⁻² (0.220)	0.714
Household Size (Number)	0.808 x 10 ⁻¹ (0.061)	0.625
R ² =0.144 Adjusted R-Square = 0.044		
Model test: F (11, 94) = 1.44 Prob Value = 1.168		

Source: Results from field survey 2005

Note: Figures in Parenthesis represent the Standard Error

*** Significant at 1 percent ** Significant at 5 percent

* Significant at 10 percent

The results shows that poverty status of household in round two survey affects change in food consumption of respondents at 10 percent level of significance.

As regards the impact of poverty status on non-food consumption, the poverty status of respondents at rounds 1 and 2 of the survey significantly affects non-food consumption status of farming households at 1 and 5 percents levels of significance. The negative sign of the poverty status of household indicates that the value of the constant term is higher for non-poor respondents than it is for the poor respondents. The implication of these findings is that the non-poor will experience a wide fluctuation in non-food consumption than the poor. The age of respondents and household location status also

affects significantly the change in consumption of nonfood products at 10 percent level of significance. The implication of this finding is that as the age of respondents' increases, the consumption change with respect to non-food expenditure will decline. It could also be interpreted to mean that as age of respondents reduces so will their change in consumption with respect to nonfood expenditure widens. The interpretation of location status of household head implies that the value of constant term of semi urban located households is higher when compared to that of rural located households. The fluctuation in consumption of non-food product among semi-urban households will therefore be higher than those of rural households.

The other variable that was significant in the analysis is the educational status of household head. The positive value of the variable indicates that a unit change in household head educational

Table 5: The effect of household head observable characteristics on per capita non-food expenditure

<i>Δ In Real Per Capita Non-Food Consumption</i>		
<i>Variable</i>	<i>Coefficient</i>	<i>Prob-Value</i>
Constant	0.982*** (0.690)	0.005
Age	-0.395 x 10 ⁻¹ * (0.234 x 10 ⁻¹)	0.096
Age ²	0.403 x 10 ⁻³ (0.264 x 10 ⁻³)	0.129
Household Head Working Status (Dummy)	-0.125 (0.278)	0.655
Educational Status (Years)	0.338 x 10 ⁻¹ (0.132 x 10 ⁻¹)	0.0122
Household Location (Dummy)	-0.232* (0.135)	0.0881
Δ Ln Income Among Household (Naira)	-0.283 (0.659 x 10 ⁻³)	0.668
Poverty Status Of Household In Round 1 (Dummy) Poor = 1, Non-Poor = 0	-0.421*** (0.170)	0.013
Poverty Status Of Household In Round 2 (Dummy) Poor = 1, Non-Poor = 0	-0.301** (0.149)	0.046
Vulnerability Status Of Household Change In Household Income (Naira)	0.349 x 10 ⁻⁶ (0.134 x 10 ⁻⁵)	0.7945
Household Size (Number)	-0.131 x 10 ⁻¹ (0.227 x 10 ⁻¹)	0.5653
Farm Size Of Household (Hectares)	0.197 x 10 ⁻¹ (0.171 x 10 ⁻¹)	0.2503
R ² = 0.297 Adjusted R-Square = 0.215 Model Test: F (11,94) = 3.62 Prob Value : 0.00027		

Source: Results from field survey 2005

Note: Figures in Parenthesis are Standard Error

*** Significant at 1 percent ** Significant at 5 percent

* Significant at 10 percent

Table 6: The effect of household head observable characteristics on per capita total expenditure

<i>Δ In Real Per Capita Total Expenditure</i>		
<i>Variable</i>	<i>Coefficient</i>	<i>Prob-Value</i>
Constant	3.589*** (1.033)	0.001
Age	-0.521x10 ⁻¹ (0.395 x10 ⁻¹)	0.142
Age ²	0.388 x10 ⁻³ (0.395 x10 ⁻³)	0.328
Household Head Working Status (Dummy)	-0.512 (0.416)	0.222
Educational Status (Years)	0.447 x10 ⁻¹ ** (0.198 x10 ⁻¹)	0.026
Household Location (Dummy)	-0.400 (0.202)	0.051
Δ Ln Income Among Household (Naira)	-0.546** (0.250)	0.461
Poverty Status Of Household In Round 1 (Dummy) Poor = 1, Non-Poor = 0	-0.552** (0.223)	0.031
Poverty Status Of Household In Round 2 (Dummy) Poor = 1, Non-Poor = 0	0.056 x10 ⁻⁶ ** (0.200 x10 ⁻⁵)	0.015
Vulnerability Status Of Household Change In Household Income (Naira)	0.056x110 ⁻⁶ (0.200x10 ⁻⁶)	0.780
Household Size (Number)	-0.212 x10 ⁻¹ (0.341 x10 ⁻¹)	0.535
Farm Size Of Household (Hectares)	0.278 x10 ⁻¹ (0.256 x10 ⁻¹)	0.280
R ² = 0.317 Adjusted R-Square = 0.2334 Model Test: F (11,94) = 3.91 Prob Value : 0.001		

Source: Results from field survey 2005

* Significant at 1 percent; ** Significant at 5 percent;

*** Significant at 10 percent

status will bring about a higher change in consumption of non-food expenditure. The reason for this result is not far fetched, since respondents are most likely to experience great fluctuations in the consumption of non-food expenditure (such as utility bills, tuition bills and energy bills) as they become more educated. The effects of households head observable characteristic was further assessed with respect to total per capita food expenditure of respondents. Findings from Table 6 shows educational status positively and significantly influencing household consumption at 5 percent level of significance while both poverty status of respondents in rounds 1 and 2 also negatively impact on change in consumption of respondents at 5 percent level of significance.

5. CONCLUSION

On the basis of the findings of this study, the following conclusions were arrived at

- Employment shocks such as illness will most likely lead to higher fluctuations in food consumption of respondents in the study area. Therefore, respondents in the study area are vulnerable to one key economic shock.
- Farming households in the study area are however able to insulate their non-food consumption expenditure from economic shocks such as employment shocks and wage arrears.
- Non Poor respondents will most likely experience wide variations in their consumption of non food products in the study area since the value of their constant term is higher than those of the poor. This imply that the non poor are likely to experience significant sharp increases in consumption of non food products when compared to average expenditure on non food products in the study area. The poor however will most likely experience a low increase or sharp decline in consumption of non food products when their non food expenditure is compared with average non food expenditure estimates of the study area.
- An increase in respondent's age will most likely reduce high fluctuations in non food expenditure profile which could further imply that aged people are less vulnerable to risk of wide fluctuations in the non food expenditure profile.

6. RECOMMENDATIONS

- There is an urgent need to improve the activities of the Primary health care centers located in rural areas to make them meet the health care needs of rural farming households (most especially in the study area). This improved activities should be in form of Preventive and curative capacities. This is so, since, findings have shown that employment shock as a result of illness brings about high fluctuation in consumption profile of respondents thereby reducing their consumption smoothing capabilities considerably.
- There is an urgent need to enhance the consumption smoothing capacity of young people in the study area. This could be achieved by specifically mounting programmes that will target young people to reduce their high level of risk to high fluctuations in their non-food expenditure profile. This could be achieved by successful implementation of programmes such as school feeding conditional cash transfer and employment creation programmes.

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REFERENCES

- Adegeye, A.J. 1998. "Production and Marketing in Cocoa in Nigeria", in A. J. Adegeye and W.O. Ajayi (eds.), *Cocoa Revolution in Nigeria Proceedings of a National Seminar on Revolutionising Nigeria's Cocoa Industry*. Ibadan: University of Ibadan, 28th –30th November.
- Adubi, A.F., F. Ogumike and A. Agba. 2002. *Major Sources and Levels of Risks in Nigeria*. Consultant Report for the World Bank/NPC Social Risk Assessment Exercise.
- Adubi, A.A. 1992. *An Empirical Analysis of Production Risk and Attitudes of Small farmers in Oyo State, Nigeria*. Unpublished Ph.D Thesis, Ibadan: University of Ibadan
- Ajani, O.I.Y. 2002. *Resource Productivity in Food Crop Farming in the Northern Area of Oyo State, Nigeria*. Unpublished Ph.D Thesis, Department of Agricultural Economics, Ibadan: University of Ibadan.
- Alayande, B.A. 2003. *Determinants of Vulnerability to Poverty in Nigeria*. A Probit Analysis Consultant Report for World Bank/NPC Social Risk Assessment Exercise.

- Alderman, A. and C. Paxson. 1992. "Do the Poor Insure" A Synthesis of Literature on Risk and Consumption in Developing Countries". Policy Research Working Paper. Agricultural Policies WPS 1008, The World Bank.
- Chauduri, S. 2000. *Emperical Methods for Assessing Household Vulnerability to Poverty*. March Mimeo School of International and Public Affairs. Columbia University.
- Deaton, A. 1991. "Savings Liquidity Constraints." *Econometrica*, 59(5): 1221-1248.
- Deaton, A. 1992. *Understanding Consumption. Caredon Lectures in Economics*, London: Oxford University Press
- Fafschamps, M. 1999. *Rural Poverty, Risk and Development*. Report Submitted to Food and Agriculture Organisation (FAO).
- Heitzmann, K.R.S. Canagarajah and P.B. Siogel. 2002. "Guidelines for Assessing the Sources of Risk and Vulnerability." *Social Protection Discussion Paper 0218*. Washington D.C.: World Bank.
- Hoddinolt, J. and A. Quisumbing. 2003. *Data Sources for Microeconometric Risk and Vulnerability Assessments*. Washington D.C.: IFPRI.
- Holzmann, R. 2000. "Social Risk Management". *A New Conceptual Framework for Social Protection and Beyond. Social Protection Discussion Paper 0006*. Washington DC.: World Bank, Human Development Network,
- Holzmann, R. and S. Jorgensen. 2000. "Social Risk Management: A New Conceptual Framework for Social Protection and Beyond. Social Protection." *Discussion Paper No. 0006*. Washington DC.: The World Bank.
- John, J. 2003. *Economics of Non-Timber Forest Products in Oyo State*. An Unpublished M.Sc Dissertation Department of Agricultural Economics University of Ibadan.
- Kochar A. 1998. "Smoothing Consumption by Smoothing Income. Hours of Work Responses to Idiosyncratic Agricultural Shocks in Rural India." *The Review of Economics and Statistics*, 81(1): 50-61.
- Ligon, E. 2001. "Targeting and Informal Insurance." UC Berkely Working Paper.
- Okunmadewa, F.Y. 2003. "Nigeria: Risk and Vulnerability Assessment – An Overview." *A paper presented at Chelsea Hotel, Abuja*.
- Olaniyan, O. G. Oyeranti, A Bankole and O. A. Oni. 2003. "Evaluation of Risk Management Agencies in Nigeria." A Final Research Report Submitted to the Social Protection Team, World Bank Abuja, Nigeria. *Paper presented at Workshop Organized by the World Bank ./NPC*
- Quisumbing, A. 2002. "Consumption Smoothing, Vulnerability, and Poverty in Rural Bangladesh" Draft IFPRI Washington D.C.
- Schechter, L. 2001. "Identifying Vulnerable." Households Draft, Department of Agricultural Economics ,University of California Barkeley.
- Skoufias, E. 2002. "Measuring Household Vulnerability to Risk." Some Estimates from Russia. IFPRI, Washington DC 2006.
- Umoh, G.S. and A.J. Adegeye. 2000. "Optimal Farm Plan and Risks in Wetlands (FADAMA) Agriculture: The Case of Inland Valleys." *Nigerian Agricultural Development Studies*, 1(1): 97-116.
- World Bank. 2000. "Social Protection Sector Strategy: From Safety Net to Trampoline." Washington DC.: Human Development Network, Social Protection Team.
- World Bank. 2001. *World Development Report 2000/2001. Attacking Poverty*. London: Oxford University Press.