ASSESSMENT OF HOUSEHOLD VULNERABILITY TO COMMON URBAN HOUSEHOLD FOOD SHOCKS IN SOUTH WESTERN NIGERIA: A CASE STUDY OF LAGOS METROPOLIS, NIGERIA.

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ABSTRACT:
This paper investigates the influence of urban household shocks on the vulnerability of urban households to food poverty in Lagos metropolis. Primary data was gathered using questionnaire. A panel data set of 180 households was used for the purpose of analysis with data gathered during harvest and hunger periods. Data obtained was analysed using descriptive statistics and a 3 step Feasible Generalised Least Squares procedure. Findings from the research showed that of the identifiable urban household food shocks, job loss was significant in household per capita food consumption ($p < 0.1$), while number of spouses ($p< 0.05$), household size ($p < 0.01$), and minimum level of education of household members ($p < 0.05$) were other significant factors affecting per capita food consumption. Management Strategy ($p < 0.1$) as a coping strategy significantly influenced household per capita food consumption. Idiosyncratic shocks ($p < 0.1$) rather than specifically identified shocks were significant determinants of household food vulnerability. The paper recommends that efforts at curbing the influence of shocks on urban households should address job security as means of reducing urban household vulnerability to food poverty.
KEYWORDS: Shocks, vulnerability, poverty, coping, urban.
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INTRODUCTION:

"*.....the stomach is a bottomless pit, a hole as big as the world.... No, there is nothing people will not do (for it), and the sooner you learn that, the better off you will be...*" Auster (1987).

Food security is defined as the physical and economic access to sufficient, safe and nutritious food to meet dietary needs. Three aspects of food security are food availability, food access and food adequacy (Lantham, 1997). It has been argued that in order to achieve national food security, a country must attain these three basic aspects (IFPRI, 2002). In the absence of food security, an ensuing condition of hunger reigns.

Hunger has become a spectre that hangs menacingly over a significant proportion of the world population. By aggregation, about 1billion people in the world over are hungry i.e. 1 in 7 persons in the world (FAO, 2010).

This problem of hunger and its multifaceted manifestations is however more pronounced among particular population groups. Particular portions of the world population are more susceptible than the others to food welfare downturns, instability or uncertainty, than others. In the face of risky situations, this proportion of the population in the world over is likely to experience uncertain food situations or wide uninsurable fluctuations or variations from the norm than the other households/individuals. This proportion of the world population are said to be food vulnerable. Thomas (2008) in identifying particular vulnerable groups in urban areas, pointed out that not only do low income groups face higher levels of risk but also that they have less possibility of getting rapid and appropriate medical treatment if they are injured or fall ill as a result of some environmental hazard. They can least afford treatment and medication or income loss while recovering from sickness or injury, and often have jobs that do not provide for health insurance or sick leave.

From the foregoing, it is clear that problems of food and hunger, given present trends of urbanisation, could be attenuated and seriously become pronounced. Delisle (1990), is of the opinion that as more and more people in developing countries live in cities, urban food and nutrition issues are becoming increasingly relevant and pressing. It was argued that new approaches focusing on urban consumers need to be developed, in which the urban/rural dichotomy has to give way to strategies integrating both.

Likewise, Giovanni *et al*. (1987) pointed out that a demographic revolution is moving hunger and poverty problems in developing countries from rural areas to urban areas. About half of the urban dwellers in the third world were claimed to be migrants from rural areas and the majority are believed to live in overcrowded slums or makeshifts squatter settlements with the number increasing rapidly. Not only is urbanisation a major culprit for hunger but as Rossi-Espagnet (1986), quoting from World Bank findings, stated, the frequency and severity of malnutrition in the developing world are increasing more rapidly in the urban than in the rural areas. It was asserted that urbanization had become in size and speed a severe problem everywhere, and that as the urban growth rate is increasing, the rural growth rate is decreasing. There is a considerable variation among countries in the extent and speed of urbanization, but no developing nation can afford to ignore the phenomenon. Also, Kumar *et al.* (2006), argued that food habit in general are influenced by socio cultural background, religious beliefs and customs, and individual taste.

Although urbanization is the driving force for modernization, economic growth and development, there is increasing concern about the effects of expanding cities, principally on human health, livelihoods and the environment. The implications of rapid urbanization and demographic trends for employment, food security, water supply, shelter and sanitation, especially the disposal of wastes (solid and liquid) that the cities produce are staggering (UNCED, 1992).

Rapid urbanization has posed many challenges to all but the developing countries are the ones which are finding it increasingly difficult to respond to these challenges. Competition ensues for food, housing facilities and other public services required for the daily comforts of the urban life. Economic reasoning suggests that with ever increasing demand, prices are driven higher, at times beyond the reach of the common man. This poses serious problem for the members of the urban population that are less economically enabled compared to the privileged few with good paying jobs and access to required facilities for urban comforts.

The question that arises is, how then do households living within the ambit of this urbanization trends, caught in the cross-fire of the ills of urbanization, fare in terms of food security season after

season? This is especially so for households living in cities and metropolises where the effects of urbanisation and attendant shocks, are most felt. As such, Lagos metropolis, a metropolis speedily assuming the status of a mega city in South Western Nigeria, as well as a rapidly urbanising metropolis, is selected for the purpose of investigating the influence of urban shocks on household food status as well as addressing the response of households to selected urban shocks in terms of coping strategies.

Objectives

The broad objective of this research work is to assess and analyse factors responsible for food vulnerability in urban areas using panel data in Lagos metropolis. However, the specific objectives are to;

i. determine the factors responsible for household food vulnerability in urban areas transiting from harvest period to lean or hunger period..
ii. identify the coping strategies used by various households in urban areas during hunger periods.
iii. make recommendations based on findings.

Theoretical and Conceptual Framework

The concept of vulnerability relates to the occurrence of events which negatively impact on something, such as individuals, households, enterprises, communities and countries. Household vulnerability is seen as the inability of a household to secure its living standards in the face of a certain negative event (Luigi, 2004). Vulnerability generally refers to the potential to be adversely affected by an event or change (Kelly and Adger, 2000).

Household vulnerability is therefore the combination of two facts: the exposure to a negative event and the capacity of the household to cope with it (Chambers, 1989). Following this definition, an assessment of vulnerability should examine the nature of the shock, how this is transmitted to the household as well as the coping mechanisms available at the household level (Holzman *et al*., 2000, Shaffer, 2001)

In economic literature, household vulnerability is defined as an outcome of a process of household responses to risks. This risk-response-outcome framework may be examined in terms of poverty dynamics (poverty status: transition in and out of poverty), food security (probability of not meeting food needs), environment (survival loss), health (malnourishment), disaster management (welfare loss) etc. Thus vulnerable households are those that are in, or are very close to, a state of destitution as a result of the cumulative process of a particular risk and household response.

The notion of vulnerability in the context of poverty is not as developed as the meaning and measurement of poverty. For the purpose of empirical assessments and quantifications, Alwang *et al* (2001), adopted as the working concept of vulnerability the idea that a household is said to be vulnerable to future loss of welfare below socially accepted norms caused by risky events. The degree of vulnerability depends on the characteristics of the risk and the households' ability to respond to risk. Ability to respond depends on household characteristics, notably the asset base. The outcome is defined with respect to some benchmark- a socially accepted minimum reference level of welfare (e.g. a food poverty line). Measurement of vulnerability will also depend on the time horizon as a household may be vulnerable to risks over the next month, year, etc.

The approach adopted for this work, borrowed from the works of Chaudhuri et al.(2002), Christiaensen et al. (2000) and theoretical definitions derived from Alwang et al (2001), Luigi (2004) and Chambers (1989), considers vulnerability as the probability of falling into poverty. This approach to vulnerability considers household consumption determined by individual characteristics

and subject to covariate or idiosyncratic risk factors. The idea is to construct an appropriate probability distribution of consumption, taking into account the cumulative probability distribution and density functions of consumption, vulnerability indicators relating to the family of the Foster, Greer and Thorbecke (FGT) indices for groups of households.

Vulnerability would therefore be denoted as V_h (Y_h,Z,P_h), where P_h is the probability that a household's welfare (Y_h), in this case captured by food consumption, will fall below the given food poverty line (Z), and V being the appropriate vulnerability index. A threshold probability or focal point can be used to differentiate the vulnerable from the non-vulnerable households. Vulnerability can thus be defined as the probability that consumption at period t+1 denoted as C_{t+1}, will fall below an *ex ante* defined poverty line (Z).

Chaudhuri *et al* (2002) developed a methodology for estimating vulnerability to poverty using cross-sectional data. A household's vulnerability to poverty can be expressed as the probability statement reflecting its inability to attain a certain minimum level of consumption in the future. Formally, the vulnerability level of a household h at time t is expressed as the probability that the household will find itself consumption poor at time t+1 as:

$$V_{h,t} = \Pr (C_{h,t+1} \leq Z) \quad (1)$$

Where C measures the household's per capita consumption at time t+1 and Z is an appropriate consumption benchmark (poverty line), and Pr is the probability function.

The probability that a household will find itself poor depends not only on its expected (mean) consumption but also on the volatility (i.e. variance) of its consumption stream. Therefore, both estimates (household expected consumption and the variance of its consumption) are required to quantify the level of household vulnerability to poverty.

Research Methodology

Sample population

The sample population for this research was drawn from Lagos metropolis to capture Low Income high population density areas, Medium Income medium population density areas and High Income low population density areas. Based on a classification model adopted by Okuneye et al (2007) to study the interplay of migration and urban expansion on health and environment in Lagos metropolis, the three types of settlements were drawn from Lagos metropolis.

Lagos metropolis

Ikoyi LGA was selected to represent High Income Low Population density settlements. Surulere LGA was selected to represent Middle Income and Medium Population Density settlements. While Agege LGA was selected to represent Low Income and High Population density settlements.

Analytical technique

The 3- Stage Feasible Generalised Least Squares regression model was used to analyse objective (1) which is to determine the socio-economic factors responsible for household food vulnerability transiting from one season to another in Lagos State.

The model for this research work is specified in formal terms as follows

$$\ln c_j = \alpha + \beta X_j + \varepsilon_j \quad (2)$$

where j= 1,2,....n is the unit of analysis, namely the household

X_j is a vector of exogenous determinants of household welfare in this case log of household food expenditure ($\ln c_j$)

X_1= Number of adult males (16-65yrs) residential within the household

X_2= Number of adult females (16-65yrs) residential within the household

X_3= number of spouses had by household head
X_4= Sex of household head (Male=1, Female=0)
X_5= Household Size
X_6= Household Savings in formal and informal sources
X_7= Major occupation of household head (Self-employed=1, Employee=0)
X_8= ownership of non residential land (owned =1, not owned=0)
X_9= Part time occupations of household head (part- time jobs=1, no part time jobs =0)
X_{10}= management coping strategy (any management strategy used=1, non-use of management strategy= 0)
X_{11}= asset coping strategy (any asset coping strategy used=1, non-use of asset strategy =0)
X_{12}= social group coping strategy (any social group coping strategy used= 1, non-use of social group coping strategy= 0)
X_{13}= Experience of job loss within the research year (Yes=1, No=0)
X_{14}= Experience of hospitalised illness within the research year (Yes=1, No=0)
X_{15}= Eviction notice(s) served within the research year (Yes=1, No=0)
X_{16}= Number of household member with minimum of primary education
α is the intercept
β is the set of coefficients to be estimated by the regression and
ε_j is the random error term.

Empirically, this was achieved as follows. Adopting the 3 stage feasible generalised least squares approach adopted by Chaudhuri *et al.* (2002), Luigi (2004), Harroon *et al.* (2009), Christaensen and Subbarao (2005), the household per capita food consumption is stated as follows to obtain the expected consumption and variance of consumption.

The stochastic process generating the consumption of a household is given by:

$$\ln C_h = X_h\beta + e_h \quad (3)$$

where C_h is per capita food consumption expenditure, X_h represents observable household characteristics such as household size, sex of household head, educational attainment of the household head, etc., β is a vector of parameters and e_h is a mean-zero disturbance term that captures idiosyncratic factors (shocks such as job loss within the research year, eviction notices served within the research year, experience of illnesses requiring hospitalisation are already included as identifiable common urban households shocks), that contribute to different per capita consumption levels for households that are otherwise observationally equivalent.

The variance e_h is however not identically distributed across households and depends upon observable characteristics. Therefore, a simple functional form is used to relate variance of the consumption function and household characteristics as follows;

$$\sigma^2_{e,h} = X_h\Theta \quad (4)$$

Both Christiaensen and Subbarao (2005) and Chaudhuri *et al.* (2002) have utilised a three step feasible generalised least squares (FGLS) procedure to estimate β and Θ as follows;

Estimating equation (4) above using an Ordinary Least Square Procedure.

The residuals e_h obtained from equation (2) are then regressed on X_h using OLS as

$$e^2_{OLS,h} = X_h\Theta + n_h \quad (5)$$

The predictions $X_h\Theta$ from this regression are used to re-estimate (5) using OLS after having corrected each residual by $X_h\Theta$ as follows;

$$\frac{}{}' = \frac{}{}\theta + \frac{}{} \quad (6)$$

New estimates of Θ which are asymptotically efficient and are used to weigh equation (5) are obtained by using OLS to estimate equation (6). It can be shown that Θ_{FGLS} is a consistent estimate

of $\sigma^2_{e,h}$ which is the variance of the idiosyncratic component of household consumption. Using the standard error of Θ_{FGLS} equation (4) is transformed as follows;

$$\sigma_{e,h} = \sqrt{h\Theta} \quad (7)$$

$$\frac{}{} = (\frac{}{})\beta + e_{h/}\ \sigma_{e,h} \quad (8)$$

The new estimates of Θ and β are asymptotically efficient and symbolises expected value of consumption and its variance given X_h as

$$E[\ln C_h / X_h] = X_h\ \beta \quad (9)$$

$$Var[\ln C_h / X_h] \equiv \sigma^2_{e,h} = X_h\Theta \quad (10)$$

Where equations (9) and (10) are conditional expectations of log consumption and conditional variance of log consumption.

Adopting this empirical approach of Chaudhuri *et al.* (2002) as well as Christiaensen and Subbarao (2005) for the estimation of the conditional log consumption and conditional variance of consumption, we follow Chaudhuri (2002) by assuming that per capita food consumption is log-normally distributed, and use this estimates accordingly to form estimate of the probability of household's food vulnerability or household vulnerability index, where the *ex ante* identified poverty line for 2010 according to NBS (2011) was 39,579.49 NGN per capita per annum, which interprets as 3,317 NGN per capita per month. Letting $\Phi(.)$ denote the cumulative distribution function of the standard normal distribution, this estimated probability was given by:

$$V_h = Pr(\ln Y_h < \ln Z_h | X_h) = \Phi\ \frac{}{\sqrt{\ }} \quad (11)$$

Following Chaudhuri (2000), two natural thresholds for vulnerability index or estimate are selected: viz., the observed national poverty rate, in this case of food vulnerability, the proportion of population consuming below 2900 Calories of food per day and the threshold 50%. The rationale for choosing 50% has to do with having a household having at least an even chance of having food consumption downturn in the next period (Ramon et al, 2007). Using these two thresholds, operationally a household is defined as food vulnerable if the predicted vulnerability level is greater than the national rate or proportion which for 2010 was 38.7% (National Bureau of Statistics, NBS, 2011), highly food vulnerable if the vulnerability level is greater than 50% and relatively vulnerable if the household is vulnerable but not highly vulnerable.

Results & Discussion

Table 1 shows that in Lagos metropolis, in all the three areas, majority of the households were male headed with as much as over 70% of the respondents in two of the areas (76.7% and 76% respectively for the low income Agege and high income Ikoyi settlements). It also showed that among the household heads none was above 60 years of age in the low income Agege, while a very minute portion of the medium income Surulere and high income Ikoyi population (1.7% and 3% respectively) had household heads above the age of 60. Interestingly, majority of the interviewed household heads were between the ages of 31 and 40 years (51.7%, 40.7% and 36.7% respectively for low income Agege, medium income Surulere and high income Ikoyi areas). The implication of having majority of the household head being within this young age group is that most of them are still economically active and productive, capable of pursuing multiple livelihood strategies and ensuring household food security through various streams of income.

Table 1: Socio-economic characteristics of households in Lagos metropolis

	LI (Agege)		MI (Surulere)		HI(Ikoyi)		Total	
	Freq	**%**	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**
Sex of household head								
Male	46	76.7	40	67.8	50	83.3	136	76.0
Female	14	23.3	19	32.2	10	16.7	43	24.0
Total	60	100.0	59*	100.0	60	100.0	179	100.0
Age of household head								
Below 30 yrs	1	1.7	3	5.1	4	6.7	8	4.5
31-40 yrs	31	51.7	24	40.7	22	36.7	77	43.1
41-50 yrs	18	30.0	23	39.0	19	31.7	60	33.2
51-60 yrs	10	16.7	8	13.6	13	21.7	31	17.4
Above 60 yrs	0	0.0	1	1.7	2	3.3	3	1.8
Total	60	100.0	59*	100.0	60	100.0	179	100.0
Household size								
<4 members	18	30.0	13	22.0	23	38.2	54	30.2
4- 8 members	41	68.3	43	74.9	37	61.7	121	67.6
>8 members	1	1.7	3	5.1	0	0.0	4	2.2
Total	60	100.0	59*	100.0	60	100.0	179	100.0
Household members with minimum of pry sch education								
0	4	6.7	3	5.1	2	3.3	9	5.1
1-3 members	24	40.0	29	49.1	38	63.3	91	50.8
4-8 members	31	41.6	26	44.1	20	33.4	77	43.0
>8 members	1	1.7	1	1.7	0	0.0	2	1.1
Total	60	100.0	59*	100.0	60	100.0	179	100.0
Occupation type of household head								
Self employed	25	41.7	22	37.3	23	38.3	70	39.1
Employee	35	58.3	37	62.7	37	61.7	109	60.9
Total	60	100.0	59*	100.0	60	100.0	179	100.0
Secondary income sources by household heads								
Yes	17	28.7	24	40.7	20	33.3	61	34.1
No	43	71.7	35	59.3	40	66.7	118	65.9
Ratio of working household members								
0.1 to 0.25	2	36.67	23	39.0	26	43.33	51	28.5
0.26 to 0.50	24	10.00	30	50.8	23	38.33	77	43.0
0.50 to 0.75	32	46.67	1	1.7	10	16.67	43	24.0
0.76 to 0.99	2	6.67	5	8.5	1	1.67	8	4.5
Total	60	100.0	59*	100.0	60	100.0	179	100.0

Source: Field Survey, 2011.

On the down side however, as it has been argued, wealth tends to be accumulated over a life cycle and it is thus expected that households with older household head tend to have broader wealth base acquired over the years (Wolff, 1979). This is in consonance with lice cycle income hypothesis. This wealth base could serve as household insurance against food consumption shocks/risks if the need arises, lacking which, the households suffer. It was observed that none of the respondents from

the high income Ikoyi settlement had household sizes above 8 members while households in medium income Surulere and low income Agege settlements had (5.1% and 1.7% respectively) had. All 3 settlements had majority of the household heads being employed in both the public and private sectors (58.3%, 62.7% and 61.7% respectively for low income Agege, medium income Surulere and high income Ikoyi settlements). Again, even though all three settlements had about a third of interviewed household heads with alternative/secondary sources of income, majority were without secondary sources of income (71.7%, 59.3% and 66.7% respectively for the low income Agege, medium income Surulere and high income Ikoyi settlements). Having an alternative source of income would serve as an insurance for the household against income shocks or income loss arising from any form of eventuality that could be unforeseen especially for households with heads being self employed and whose livelihood are seriously subject to the vicissitude of economic environment in which they are found.

Table 2 shows respondents' experiences of specific common urban shocks during the research year in Lagos metropolis. The experience of job loss within the year was most observed in low income Agege settlement area with about a third of the respondents (33.3%) followed by about a fourth (25.4%) in medium income Surulere settlement area. The experience of job loss was least experienced in high income Ikoyi settlement area (15%). In like manner, illnesses requiring hospitalisation was most observed in low income Agege (48.3%) followed by respondents in the medium income Surulere (40.7%) and then by respondents in high income Ikoyi settlement areas (35%). The same pattern of household experiences across settlements also decreased from low income Agege settlements, to medium income settlements, to high income settlements (43.3% to 40.7% to 21.7%).

Table 2: Percentage Distribution of Identifiable common urban households' shocks in Lagos metropolis

	LI (Agege)		MI (Surulere)		HI(Ikoyi)		Total	
	Freq	%	Freq	%	Freq	%	Freq	%
Job loss								
Experienced	20	33.3	15	25.4	9	15.0	44	24.6
Not experienced	40	66.7	44	74.6	51	85.0	135	75.4
Total	60	100.0	59	100.0	60	100.0	179	100.0
Hospitalised illnesses								
Experienced	29	48.3	24	40.7	21	35.0	74	41.3
Not experienced	31	51.7	35	59.3	39	65.0	105	58.7
Total	60	100.0	59	100.0	60	100.0	179	100.0
Eviction notices								
Experienced	26	43.3	24	40.7	13	21.7	63	35.2
Not experienced	34	56.7	35	59.3	47	78.3	116	64.8
Total	60	100.0	59	100.0	60	100.0	179	100.0

Source: Field Survey, 2011

Table 3 shows the types of threat to household consumption experienced by households in the various settlement of the Lagos metropolis. In all 3 income settlements, like in Ibadan metropolis, very few of the respondents identified threats to household food consumption. About 11.2% identified inadequate fund as threats to household food consumption followed by 6.1% who identified lateness of wages as threats to household food consumption. 15% of the households in low income Agege settlement area identified inadequate funds, closely followed by 11.7% of respondents in high income settlement area of Ikoyi. In medium income Surulere settlement area, just about 6.8% of respondent identified inadequate fund as threat to household food consumption.

These threats were similar to threats to food consumption identified in the work of Adekoya (2009). The existence of these types of shocks these metropolises confirm the findings of Quisumbing (2007) and Krueger and Fabrizio (2011) on common significant shocks affecting food consumption as including illnesses, income loss from job loss and property divisions.

About 48.6% of the respondents in Lagos metropolis, borrowed as well as another 48.6% of respondents who cut consumption in the face of threat to household food consumption. About 34% of respondents in the metropolis, sell off strategic assets, while another 30.2% sell more labour services in the face of threat to household food consumption.

The regression explains a rather small proportion of the error, in the metropolis as shown in table 4. This suggests that unexplained components of consumption variability dominate any parts that may be due to structural household specific factors. This finding is in line with that of Sarris and Karfakis (2006). In Lagos metropolis, households being headed by male members significantly increased the variability of consumption

Table 3: **Types of consumption threat and household coping strategies in Lagos metropolis**

	LI (Agege)		**MI (Sururlere)**		**HI(Ikoyi)**		**Total**	
	Freq	**%**	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**
THREAT TO HOUSEHOLD CONSUMPTION								
Inadequate fund	9	15.0	4	6.8	7	11.7	20	11.2
Lateness of wages	3	5.0	0	0.0	8	13.3	11	6.1
High cost of living	3	5.0	0	0.0	1	1.7	4	2.2
Sickness or death	0	0.0	0	0.0	0	0.0	0	0.0
Loss of livelihood	0	0.0	0	0.0	0	0.0	0	0.0
Out of job	0	0.0	0	0.0	0	0.0	0	0.0
COPING STRATEGIES								
Intensification strategy								
Sales of strategic assets	30	50.0	18	30.5	13	21.7	61	34.0
Sales of more labour services	21	35.0	13	22.0	20	33.3	54	30.2
Migration to greener pastures	4	6.7	0	0	5	8.3	9	5.0
Urban agriculture	0	0.0	0	0	1	1.7	1	0.6
Management strategy								
Borrowing	34	56.7	20	33.9	33	53.3	87	48.6
Split expenses	16	26.7	12	20.3	6	10.0	34	19.0
Exchange services	0	0.0	1	1.7	0	0.0	1	0.6
Resource pooling	5	8.3	1	1.7	4	6.7	10	5.6
Consumption strategy								
Cut consumption	36	60.0	21	35.6	30	50.0	87	48.6
Leave consumption untouched	10	16.7	8	13.6	8	13.3	26	14.5
Asset strategy								
Sales of luxuries	24	40.0	10	16.9	16	26.7	50	27.9
Sales of replaceable assets	12	20.0	6	10.2	9	15.0	27	15.0
Safety nets/ social groups								
Religious bodies	9	15.0	9	15.3	5	8.3	23	12.8
Ethnic groups	2	3.3	2	3.4	4	6.7	8	4.5
Cooperatives	24	40.0	12	20.3	18	30.0	54	30.2
Banks	6	10.0	3	5.1	8	13.3	17	9.5
Friends and family	10	16.7	2	3.4	10	16.7	22	12.3

Source: Field Survey, 2011

Table 4: 3-Stage FGLS estimates of conditional mean and conditional variance of log calorie intake per capita during the hunger season

	Lagos metropolis	
	Log per capita consumption $E(\ln C_{t+1}\|X_t)$	**Variance of log per capita consumption $\ln Var(\ln C_{t+1}\|X_t)$**
Sex	0.34E-07	0.38E-06***
	(0.3321)	(5.448)
Spouses	0.13E-07**	-0.655E-06***
	(1.98)	(-8.051)
Males>15yrs	-0.17E-07	0.447E-07**
	(-0.0518)	(1.96)
Female>15yrs	0.15E-07	0.1117E-07
	(0.3379)	(0.3654)
Household size	-0.11E-08***	-0.7450E-08
	(-2.443)	(-0.2299)
Minimum of pry education	-0.90E-09**	0.37E-08
	(-2.040)	(0.1209)
Household head job	-0.12E-07	0.4470E-07
	(-0.1419)	(0.7575)
Part-time jobs	0.83E-08	0.1862E-08
	(0.9501)	(0.0312)
Household savings	-0.014	0.174E-12
	(-0.7505)	(0.1318)
Ownership of farmland	-128.59	0.302E-08
	(-0.1319)	(0.0441)
Job loss	-0.09E-07*	0.1862E-07
	(-1.75)	(0.2817)
Illnesses	-661.25	0.7451E-08
	(-0.7526)	(0.1223)
Evictions	0.34E-08	-0.74506E-08
	(0.3774)	(-0.1162)
Management strategies	0.062E-07*	-0.16764E-07
	(1.86)	(-0.5265)
Asset strategy	-196.53	-0.00001*
	(-0.3223)	(1.6432)
Social Group	-244.29	0.93E-09
	(-0.9053)	(0.049)
R^2, F	0.3052	4.47
N	179	

Source: Field Survey, 2011; Figures in parenthesis are t-ratios
***Significant at 0.01 level
**significant at 0.05 level
*significant at 0.10 level

The regression of the squared residuals from the consumption regressions on the same explanatory variables as the ones in the consumption regressions reveal that fewer of the variables are significant. In Lagos metropolis, dummies of sex of household head being male and household adoption of asset coping strategies, number of spouses as well as number of male household

members above 15 years of age, were the only variables explaining significant variation in household food consumption transiting to the hunger period. The largest variation in food consumption was caused by the sex of household head being male i.e. male headed households experienced wider uninsured variability in consumption compared to their female headed counterparts. In Lagos metropolis, number of male household members that were adult was next in line in the magnitude of variability in consumption it elicits. Next in line in terms of magnitude of variability in consumption was number of wives, eliciting a smaller variability but nonetheless significant variability in consumption. The last exogenous variable in terms of magnitude of variability in consumption in Lagos metropolis is the use of asset strategy. Asset strategy when used (selling of strategic households assets in face of threat to food consumption) caused the least variability in consumption (nonetheless significant) in Lagos metropolis; this could because when households sell of their assets in order to meet immediate consumption need they may end up selling off productive assets required for income for future consumption, thus it may jeopardize their chances for future consumption. In terms of per capita food consumption, different sets of variables were culprits for the metropolis. In Lagos metropolis, increase in number of spouses by household head and the use of management strategy tended to significantly increase household per capita food consumption, while increased household sizes and experience of job loss shock tended to significantly decrease per capita food consumption.

Table 5: **Vulnerability profile of households at Lagos and Ibadan metropolises**

	Lagos Metropolis
Not Vulnerable $V < 0.39$	31 (17.3)
Relatively Vulnerable $0.39 \leq V < 0.50$	84 (46.9)
Highly Vulnerable $V \geq 0.50$	64 (35.8)

Source: Field Survey, 2011

Figures in parenthesis are percentages of households in each metropolis

Table 5 shows the percentage of those who are food vulnerable in the metropolis. Of the total population of respondents, 17.3% were not food vulnerable i.e. were not in danger of being food poor in the next season based on their present characteristic and present urban risks or shocks, while the remaining 82.7% were food vulnerable i.e. in danger of being food poor in the next season based on their present characteristic and present urban risks or shocks experienced. This shows quite a high figure that requires urgent attention, the culprits of which are found in the 3 stage FGLS presented in table 4.

CONCLUSION

- Households who are otherwise observationally equivalent behaved differently with respect to food consumption when confronted with risks, constraints or shocks capable of undermining their livelihoods. As Olayiwola *et al.*(unpublished) posited that urban Nigerian households are vulnerable to idiosyncratic shocks i.e. shocks that affect households in a random fashion e.g. health risks etc.
- Coping strategies were found to be detrimental, in some instances, to the probability of households falling into food poverty in the future. The use of asset strategy where household assets and durables are sold to satisfy food consumption needs, as well as the use of social group coping strategies were found to contribute significantly to household food vulnerability.
- Male headed households were more predisposed to experience a fall of household food consumption below the established food poverty line i.e. food vulnerable.
- Compared to the national food poverty rate for 2010 (38.7%) i.e. those who were already food poor, the percentage of households that were at risk of becoming food poor (food vulnerable) in the future, was almost twice as much (87.2%) for Lagos metropolis.

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