

Multidimensional Poverty of Shock-Exposed Households and Coping Mechanisms in Rural Nigeria

T.O. Oyekale and S.A. Yusuf

Department of Agricultural Economics, University of Ibadan, Ibadan, Nigeria

Abstract: Poverty problem in Nigeria is multidimensional and it is further aggravated by some shocks that households get exposed to. In this study attempt were made to determine the socio-economic factors that influence experience of shocks by households and decomposed the multidimensional poverty across the welfare shocks and coping methods. The study used 2006 Core Welfare Indicator Questionnaire (CWIQ) data of the National Bureau of Statistics (NBS) were used. Data were analysed using descriptive statistics and Fuzzy Set. The results revealed that main shock experienced by the rural household heads is high prices of agricultural inputs. Those that are multidimensional poorer experiences shock of lack of adequate land. Most of the rural household heads usually cope with poverty by working on farms that belong to other households. The household heads that cope with poverty by begging on the street were multidimensional poorer than those that adopted other coping methods.

Key words: Welfare shocks, coping methods, multidimensional poverty, household machanism, CWIQ, rural Nigeria

INTRODUCTION

Poverty reduction is a subject that has been reemphasized as one of the brightest indicators of human progress. Policy makers are now interested in examining the role of welfare shocks towards a deeper understanding of the causes of poverty (Dercon, 2004). Some emphases have been placed on social risk management strategies that will form an integral instrument for lifting the poor out of their different forms of deprivation (Holzmann and Jorgensen, 2001).

Nigerian governments have embarked upon several processes of economic programs, which are necessary instruments for putting the nation on the path of sustainable economic growth and development. Precisely, after the Austerity Measure of 1982 failed to yield desired results, the Structural Adjustment Program (SAP) was implemented in 1986. Though some benefits were achieved at the initial stage of implementing SAP, such benefits could not trickle down to the poor. Rather, the incidence of poverty increased (Aigbokhan, 2000).

Also, adverse macroeconomic shocks that inhibit economic growth and inability of some proposed programs to tactically address unfavorable macro-economic performances are notable among the factors that contributed to increasing poverty (Aigbokhan, 2000). Since 1999, when Nigeria returned to democratically elected government, some programs have been

implemented with the fiscal policy thrusts focusing on employment generation, privatization, trade liberalization, provision of favourable environment for private sector development, reduction of public sector expenditure on salaries and overheads, encouragement of transparency and accountability in government contracts and expenditures, reduction of multiple taxes and levies faced by private companies and reduction of company and personal income taxes (CBN, 2005). Government's blueprint for economic growth and development have been summarized in some programs that are contained in the National Economic Empowerment and Development Strategies (NEEDS) document. Government is now attempting to ensure that the different facets of poverty are tactically addressed through policy and program design because of its multidimensional nature.

However, most of the times, policy makers do not have comprehensive information about the type of sufferings that could be brought on the populace through various policy programs, thereby subjecting them to some form of economic and social deprivations. Specifically, Nigerians have taken some of the programs with mixed feelings. This is because since the programs started some private and public sector workers have been sacked, petroleum prices have been reviewed upward so many times, professional workers have embarked on several industrial strikes for one demand or the other, some national industrial strikes in protest against hike in

petroleum prices have been had communal conflicts are rampant in some regions, prices of commodities are on the increase, business uncertainties are increasing, petroleum pipelines have been increasingly vandalized with serious environmental degradation consequences on some households among others. Some of these externalities sometimes have significant negative effects that often erase any positive impacts that some of this programs may have at the households level.

Therefore, previous poverty reduction programs in Nigeria did not fully achieve their objectives and this raises two important issues. First, it is not sure whether the country lacks sufficient capacity to mitigate the social risks faced by households and communities and second whether the country has not paid sufficient attention to the issue of welfare shocks and uncertainty that are important for the understanding of the dynamics that often lead households to poverty (Alayande and Alayande, 2004). It is also important to note that poverty problem in Nigeria is largely a rural phenomenon. Clear evidences to this have been obtained from all nationally representative household data that were collected. Also, within the rural areas, women and households headed by women are frequently the most chronically poor. Similarly, the northern part of the country bordering the Niger, which is arid, marginal to agriculture, environmentally damaged and densely populated have higher poverty profile (Rural Poverty Portal, 2008).

It should be noted that higher incidence of poverty profile in Nigeria's rural areas have been traced to some environmental problems associated with agricultural production, high vulnerability to health hazards (Alayande and Alayande, 2004) low level of education, high fertility rate, lack of access to improved seeds and inputs and poorly developed social infrastructural facilities (Okunmadewa, 2002) among others. Similarly due to lack of appropriate insurance against income shocks, rural poverty is often worsened because farmers dispose their productive assets such as land, livestock, equipment (etc.) in order to meet immediate consumption needs (Alayande and Alayande, 2004). Also, farming households face serious risks from inadequate rains/drought, degraded land, input shortages, disease outbreak and low prices for agricultural products.

Essentially, this study raises two main issues. First is the fact that poverty measurement in literature has recently graduated from the uni-dimensional income/expenditure approach to multidimensional approach that is based on nutrition, health, education, sanitation, housing quality, ownership of asset/fulfilment etc. (an offshoot of Sen's capability theory) (Sen, 1985, 1987). Previous approaches to analyze poverty in Nigeria

have focused on the income/expenditure approach with little attention on multidimensional poverty assessment. Second is the fact that economic literature is now emphasizing the issue of welfare shocks in poverty analysis. Such efforts are channelled towards understanding the different forms of deprivation that households suffer along with the shocks/risks being exposed to. This is considered important given the multidimensional nature of poverty. Precisely, Christiaensen and Subbarao (2001) submitted that the need for addressing the issue of welfare shocks becomes paramount because they lead to a wide variability in households incomes. In the absence of sufficient assets or insurance to smoothing consumption, such shocks may lead to irreversible losses, such as distress sale of productive assets reduced nutrient intake or interruption of education that permanently reduces human capital, thereby locking their victims in perpetual poverty.

Therefore, given the programs that Nigerian Government had embarked upon in the past few years, this study intends to use multidimensional measure of well-being to answer salient policy related questions. What are the forms of welfare shocks that households faced and what are the coping mechanisms adopted to mitigate their effects. What is the multidimensional poverty profile for rural Nigeria? How can we decompose multidimensional poverty profile across the different forms of shocks and coping mechanisms? It is believed that if reliable answers are provided to these questions, policy makers will have some required pieces of information to proffer appropriate solution to addressing poverty in Nigeria.

MATERIALS AND METHODS

The data: Data was obtained from 2006 National Core Welfare Indicator Questionnaire (CWIQ) Survey. The survey was carried out in each of the Nigeria's 36 States and the FCT. A two-stage cluster sample design was adopted for the selection of the respondents in each of the States and the FCT. The first stage involves the selection of Enumeration Areas (EAs), while selection of the Housing Units (HUs) constitute the 2nd stage. The National Population Commission (NPopC) EAs as demarcated during the 1991, Population Census served as the sampling frame for the selection of 1st stage sample units. In each LGA, a systematic selection of 10 EAs was made. This is to ensure that the number sample corresponds with the number of LGAs in each state. Prior to the second stage selection complete listing of Housing Units (and of Households within Housing Units) was carried out in each of the selected 1st stage units. These lists provided the frames for the second stage selection.

Ten HUs were then systematically selected per EA and all households in the selected HUs were interviewed. The projected sample size was 100 HUs at the LGA level. Overall, 77,400 HUs were drawn at the national level. Also, sampling weights were constructed for each sample, thus making the data representative of the entire population in Nigeria.

Method of analysis: Multidimensional poverty indices were computed using the Fuzzy Set theory originally developed by Zadeh (1965). This approach had been widely applied to poverty analysis by researchers like Cerioli and Zani (1990), Martinetti (2000), Costa (2002, 2003), Dagum (2002) and Duetsch and Silber (2005). Zadeh (1965) characterized a Fuzzy Set as a class with a continuum of grades of membership. Therefore, in a population A of n households ($A = a_1, a_2, a_3, \dots, a_n$), the subset of poor households B includes any household $a_i \in B$. These households present some degree of poverty in some of the m poverty attributes (X).

The welfare attributes considered in this study based on the CWIQ. The findings of Ayoola *et al.* (2000) for some Nigerian rural and urban areas will assist in selecting relevant welfare attributes because their study was based on focused group discussions and therefore considered to be the voice of the poor. Following Costa (2002), the degree of being poor by the ith household ($i = 1, \dots, n$) with respect to a particular attribute (j) given that ($j = 1, \dots, m$) is defined as: $\mu_B[X_j(a_i)] = x_{ij}$, $0 \leq x_{ij} \leq 1$. Specifically, $x_{ij} = 1$ when the household does not possess welfare enhancing attribute and $x_{ij} = 0$ when the household possesses it. Betti *et al.* (2005) noted that putting together categorical indicators of deprivation for individual items to construct composite indices requires decisions about assigning numerical values to the ordered categories and the weighting and scaling of the measures. Individual items indicating non-monetary deprivation often take the form of simple yes/no dichotomies. In this case x_{ij} is 0 or 1.

However, some items may involve more than two ordered categories, reflecting different degree of deprivation. Consider the general case of c = 1 to C ordered categories of some deprivation indicator with c = 1 representing the most deprived and c = C the least deprived situation. Let c_i be the category to which individual i belongs. Cerioli and Zani (1990) assuming that the rank of the categories represents an equally-spaced metric variable assigned to the individual a deprivation score as:

$$x_{ij} = \frac{(C - c_i)}{(C - 1)} \quad (1)$$

where, $1 \leq c_i \leq C$. Therefore, x_{ij} needs not to be compulsorily 0 or 1 but $0 \leq x_{ij} \leq 1$ when there are many categories of the

jth indicator and the household possesses the attribute with an intensity. The multidimensional poverty ratio of an household, $\mu_B(a_i)$, which show the level of welfare deprivation and membership to set B is defined as the weighted average of x_{ij} :

$$\mu_B(a_i) = \frac{\sum_{j=1}^m x_{ij} w_j}{\sum_{j=1}^m w_j} \quad (2)$$

w_j is the weight attached to the jth attribute. The intensity of deprivation with respect to X_j is measured by the weight w_j . It is an inverse function of the degree of deprivation and the smaller the number of households and the amount of their deprivation, the greater the weight. In practice, a weight that fulfils the above property had been proposed by Cerioli and Zani (1990). This can be expressed as:

$$w_j = \log\left[\frac{\sum_{i=1}^n g(a_i)}{\sum_{i=1}^n x_{ij} g(a_i)}\right] \geq 0 \quad (3)$$

Ideally,

$$g(a_i) / \sum_{i=1}^n g(a_i) > 0 \text{ and } g(a_i) / \sum_{i=1}^n g(a_i)$$

is the relative frequency represented by the sample observation a_i in the total population. Therefore when $x_{ij} = 0$, the welfare attribute should be removed.

The poverty ratio of the population μ_B is simply obtained as a weighted average of the poverty ratio of the ith household $\mu_B(a_i)$:

$$\mu_B = \frac{\sum_{i=1}^n \mu_B(a_i) g(a_i)}{\sum_{i=1}^n g(a_i)} \quad (4)$$

Similarly,

$$\mu_B(X_j) = \frac{\sum_{i=1}^n x_{ij} g(a_i)}{\sum_{i=1}^n g(a_i)} \quad (5)$$

In this way, it is possible to decompose the multidimensional poverty ratio of the population μ_B as the weighted average of $\mu_B(X_j)$ with weight w_j :

$$\mu_B = \frac{\sum_{i=1}^n \mu_B(a_i) g(a_i)}{\sum_{i=1}^n g(a_i)} = \frac{\sum_{j=1}^m \mu_B(X_j) w_j}{\sum_{j=1}^m w_j} \quad (6)$$

From Eq. 2, the dimension that tends to increase the level of poverty of each household can be determined by decomposing the household poverty index:

$$\mu_B(a_i) = \sum_{j=1}^m y_{ij} \quad (7)$$

where, y_{ij} is the contribution of the j-th attribute to the overall amount of the household poverty index $\mu_B(a_i)$:

$$y_{ij} = x_{ij} w_j / \sum_{j=1}^m w_j \quad (8)$$

Following Mussard and Alperin (2005), it is possible to decompose multidimensional poverty indices by sub-population. Suppose the total economic surface is divided into K groups, S_k , of size n_k ($k = 1, \dots, K$). The intensity of poverty of the i th household of S_k is given as:

$$\mu_B(a_i^k) = \frac{\sum_{j=1}^m x_{ij}^k w_j}{\sum_{j=1}^m w_j} \quad (9)$$

where, x_{ij}^k is the degree of membership related to the fuzzy sub-set B of the i -th household ($i = 1, \dots, n$) of S_k with respect to the j th attribute ($j = 1, \dots, m$). Hence, the fuzzy poverty index associated with group S_k is:

$$\mu_B^k = \frac{\sum_{i=1}^{n_k} \mu_B(a_i^k) g(a_i^k)}{\sum_{i=1}^{n_k} g(a_i^k)} \quad (10)$$

Following Eq. 8, the overall poverty index can be computed as a weighted average of the poverty within each group:

$$\mu_B = \frac{\sum_{k=1}^K \sum_{i=1}^{n_k} \mu_B(a_i^k) g(a_i^k)}{\sum_{i=1}^n g(a_i)} \quad (11)$$

Thus, the contribution of the k -th group to the global index of poverty is:

$$C_{\mu_B}^k = \frac{\sum_{i=1}^{n_k} \mu_B(a_i^k) g(a_i^k)}{\sum_{i=1}^n g(a_i)} \quad (12)$$

RESULTS AND DISCUSSION

Distribution of house heads experience of welfare shocks across the Geo-Political Zones (GPZs): Table 1 shows the frequency distribution of household heads experience of welfare shocks across the GPZs. High price of agricultural inputs was the main shock experienced by the household heads. It accounted for 22.16% of the total welfare shocks that were reported in all the GPZs. North East and South South have the highest percentages (5.22 and 5.20, respectively) of household heads that

experienced shock in the form of too high agricultural inputs price. Those who indicated that agricultural inputs were available accounted for 8.73% of the total welfare shock. North East, North West and North Central have the high percentage of the shock agricultural inputs not available. The corresponding percentages are 2.58, 2.47 and 2.04. It can therefore be generalized that none availability of agricultural inputs was the main shock in the Northern zones of the country. The third important welfare shock is hard economic times. It accounted for 6.40% of the total welfare shock. Across the zones the percentage welfare shock hard economic times is high in North West, South South and South West. The corresponding percentages are 1.25, 1.21 and 1.14. The fourth welfare shock is lack of capital for agricultural expansion. It accounted for 4.51% of the total welfare shock of which North East and South East have the highest percentage of 0.90 and 0.91, respectively. The fifth welfare shock is low agricultural production in which Northern zones have the highest percentages. 34.41% respondents did not state the welfare shock that they experienced.

In North West zone the first five welfare shocks experienced in order of their importance were high price of agricultural inputs (3.65%), none availability of agricultural inputs (2.47%), hard economic times (1.25%), low agricultural production (0.93%) and lack of capital for agricultural expansion (0.77%). In North East zone the first five welfare shocks experienced in order of their importance were high price of agricultural inputs (5.22%), none availability of agricultural inputs (2.58%), hard economic times (0.98%), low agricultural production (0.95%) and lack of capital for agricultural expansion (0.90%). In North Central zone the first five welfare shocks experienced in order of their importance were high price of agricultural inputs (3.16%), none availability of agricultural inputs (2.04%), low agricultural production (0.90%), hard economic times (0.82%) and lack of capital for agricultural expansion (0.79%).

In South East zone, the first five welfare shocks experienced in order of their importance were high price of agricultural inputs (2.74%), hard economic times (0.99%), lack of employment/jobs (0.97%), lack of capital for agricultural expansion (0.91%) and none availability of agricultural inputs (0.59%). In South West zone the first five welfare shocks experienced in order of their importance were high price of agricultural inputs (2.20%), hard economic times (1.14%), none availability of agricultural inputs (0.66%), low price for agricultural produce (0.54%) and high price of commodity (0.48%). In South South zone the first five welfare shocks experienced in order of their importance were high price of agricultural

Table 1: Frequency distribution of house heads experience of welfare shocks across Nigeria's geopolitical zones

Regions/Welfare shock	North West		North East		North central		South East		South West		South South		Total	
	Freq.	Total (%)	Freq.	Total (%)	Freq.	Total (%)	Freq.	Total (%)	Freq.	Total (%)	Freq.	Total (%)	Freq.	Total (%)
None	2101	3.57	7981	13.58	3222	5.48	1347	2.29	2843	4.84	2734	4.65	20228	34.41
Agricultural inputs prices too high	2144	3.65	3071	5.22	1856	3.16	1608	2.74	1291	2.20	3055	5.20	13025	22.16
Agricultural inputs not available	1453	2.47	1519	2.58	1197	2.04	344	0.59	386	0.66	235	0.40	5134	8.73
Low agricultural production	549	0.93	559	0.95	527	0.90	280	0.48	267	0.45	232	0.39	2414	4.11
Drought	71	0.12	127	0.22	59	0.10	28	0.05	32	0.05	4	0.01	321	0.55
Lack of adequate land	99	0.17	163	0.28	39	0.07	252	0.43	22	0.04	109	0.19	684	1.16
Low prices for agricultural produce	200	0.34	111	0.19	243	0.41	138	0.23	319	0.54	168	0.29	1179	2.01
Lack of market /buyers	64	0.11	77	0.13	80	0.14	142	0.24	162	0.28	127	0.22	652	1.11
Animal deaths from diseases	65	0.11	50	0.09	28	0.05	36	0.06	10	0.02	13	0.02	202	0.34
Lack of capital for agricultural expansion	453	0.77	532	0.90	466	0.79	537	0.91	253	0.43	412	0.70	2653	4.51
Lack of capital for business	119	0.20	189	0.32	214	0.36	370	0.63	235	0.40	287	0.49	1414	2.41
Lack of credit to start business	64	0.11	152	0.26	69	0.12	70	0.12	97	0.17	68	0.12	520	0.88
Lack of credit to expand business	63	0.11	78	0.13	80	0.14	112	0.19	99	0.17	117	0.20	549	0.93
Lack of employment /jobs	202	0.34	277	0.47	254	0.43	573	0.97	186	0.32	717	1.22	2209	3.76
Low salary	128	0.22	71	0.12	190	0.32	99	0.17	97	0.17	182	0.31	767	1.30
Retrenchment/ redundancy	5	0.01	6	0.01	18	0.03	18	0.03	10	0.02	6	0.01	63	0.11
High commodity prices	274	0.47	321	0.55	207	0.35	199	0.34	280	0.48	174	0.30	1455	2.47
Hard economic times	737	1.25	579	0.98	484	0.82	581	0.99	670	1.14	713	1.21	3764	6.40
Business not doing well	50	0.09	55	0.09	70	0.12	120	0.20	134	0.23	176	0.30	605	1.03
Low profit	74	0.13	85	0.14	55	0.09	65	0.11	137	0.23	66	0.11	482	0.82
Too much competition	17	0.03	21	0.04	25	0.04	10	0.02	18	0.03	8	0.01	99	0.17
Cultural/religious reason	5	0.01	6	0.01	2	0.00	1	0.00	3	0.01	0	0.00	17	0.03
Irregular payment of pension	1	0.00	2	0.00	16	0.03	32	0.05	11	0.02	16	0.03	78	0.13
Delayed payment of gratuity	5	0.01	5	0.01	1	0.00	11	0.02	6	0.01	9	0.02	37	0.06
Others	60	0.10	47	0.08	42	0.07	25	0.04	34	0.06	30	0.05	238	0.40
Total	9003	15.31	16084	27.36	9444	16.06	6998	11.90	7602	12.93	9658	16.43	58789	100.00

inputs (5.20%), lack of employment/jobs (1.22%), hard economic times (1.21%), lack of capital for agricultural expansion (0.70%) and lack of capital for business (0.49%).

From Table 2, it could be inferred that irregular payment of pension and delay payment of gratuity affects those that are in there late and early 60's, respectively. These shocks if not attended to could send these groups of people into their early grave. Lack of market/buyers and retrenchment/redundancy affects those that were in there early fifties. It implies that if these shocks are not addressed they might not be able to recover from it. Those that their age falls within 48 and 49 were affected idiosyncratic shocks such as lack of adequate land, low

prices for agricultural produce, animal deaths from diseases, lack of capital for agricultural expansion, lack of capital for business, lack of credit to expand business, high commodity prices, agricultural inputs prices too high, hard economic times and low profit. Low salary and cultural/religious reason affects those that are in their early forties.

The retirees that experienced delay in the payment of their gratuity have the highest household size. The lowest household size is observed with those that experience shock in form of low profit. It is also observed that those that experience shocks relating to agriculture have relatively high household size. Table 3 shows the distribution of welfare shocks across the education and

Table 2: Average ages and household sizes of rural households across welfare shocks

Welfare shocks	Frequency	Percentage of total	Mean age	SD	Mean household size	SD
None	20228	34.4078	46.6246	15.2954	5.2050	2.9555
Agricultural inputs prices too high	13025	22.1555	47.9192	15.9768	4.8795	2.8603
Agricultural inputs not available	5134	8.7329	46.1338	15.2751	5.2918	2.8423
Low agricultural production	2414	4.1062	47.7374	15.1317	5.2075	2.8852
Drought	321	0.5460	47.6854	15.2884	5.0249	2.7110
Lack of adequate land	684	1.1635	49.2164	16.1752	5.0863	2.7767
Low prices for agricultural produce	1179	2.0055	49.4266	16.0820	4.8015	3.0033
Lack of market/buyers	652	1.1091	49.8574	15.8624	4.5752	2.7315
Animal deaths from diseases	202	0.3436	47.8663	15.5047	5.1386	3.0208
Lack of capital for agricultural expansion	2653	4.5127	47.8164	15.1716	5.1346	2.9768
Lack of capital for business	1414	2.4052	48.0905	15.9439	4.7093	2.6655
Lack of credit to start business	520	0.8845	47.4173	15.3420	4.7981	2.7913
Lack of credit to expand business	549	0.9338	48.2095	16.2250	4.5082	2.6913
Lack of employment/jobs	2209	3.7575	47.0068	16.1343	4.8284	2.7439
Low salary	767	1.3047	44.0756	12.4138	5.2764	2.8967
Retrenchment/redundancy	63	0.1072	49.5714	16.2011	4.7460	2.6087
High commodity prices	1455	2.4750	48.6048	16.3472	4.8131	2.7882
Hard economic times	3764	6.4026	48.5887	15.9548	4.8512	2.8286
Business not doing well	605	1.0291	46.5273	15.1530	4.8165	2.6949
Low profit	482	0.8199	48.5664	16.5444	4.4336	2.6226
Too much competition	99	0.1684	45.8586	15.0564	4.9091	2.6112
Cultural/religious reason	17	0.0289	44.0588	12.4070	5.4706	2.6485
Irregular payment of pension	78	0.1327	67.2564	13.0707	5.1538	2.8833
Delayed payment of gratuity	37	0.0629	61.8378	10.9710	6.0811	2.8808
Some other shocks	238	0.4048	51.5168	17.1166	4.8824	2.7854
Total	58789	100.0000	47.3860	15.6225	5.0401	2.8867

Table 3: Frequency distribution of welfare shocks, education and sex in rural Nigeria

Welfare shocks/education/sex	None	Some primary	Completed primary	Some secondary	Completed secondary	Post secondary	Male	Female	Total
None	11485	572	2792	758	2383	2238	18489	1739	20228
Agricultural input prices too high	7569	607	2165	506	1449	729	10973	2052	13025
Agricultural inputs not available	3529	160	662	159	412	212	4789	345	5134
Low agricultural production	1619	105	346	80	191	73	2175	239	2414
Drought	251	6	26	18	8	12	297	24	321
Lack of adequate land	381	48	133	28	60	34	574	110	684
Low prices for agricultural produce	711	51	199	48	115	55	993	186	1179
Lack of market/buyers	337	25	144	29	85	32	521	131	652
Animal deaths from diseases	145	5	27	3	16	6	184	18	202
Lack of capital for agricultural expansion	1561	123	496	102	234	137	2329	324	2653
Lack of capital for business	634	68	341	58	202	111	1102	312	1414
Lack of credit to start business	283	19	99	16	75	28	442	78	520
Lack of credit to expand business	279	39	114	21	68	28	421	128	549
Lack of employment/jobs	825	116	492	147	385	244	1846	363	2209
Low salary	118	17	100	19	182	331	698	69	767
Retrenchment/redundancy	23	6	15	5	6	8	57	6	63
High commodity prices	825	63	243	57	173	94	1223	232	1455
Hard economic times	1976	195	709	142	476	266	3194	570	3764
Business not doing well	209	40	179	38	111	28	487	118	605
Low profit	263	18	91	26	62	22	377	105	482
Too much competition	55	4	19	4	10	7	89	10	99
Cultural/religious reason	12	0	1	0	2	2	14	3	17
Irregular payment of pension	11	5	15	2	5	40	73	5	78
Delayed payment of gratuity	8	2	10	1	3	13	34	3	37
Others	148	11	35	12	16	16	188	50	238
Total	33257	2305	9453	2279	6729	4766	51569	7220	58789

sex of the house heads. The welfare shocks affect those that do not have any form of education except shocks relating to payment of pension and gratuity. Irregular payment of pension and delayed payment of gratuity affects those that have post secondary education most.

Among those with some primary, completed primary, some secondary, completed secondary and post secondary education agricultural inputs prices too high was the main welfare shock that affect them most. Among those with some primary education other shocks that

Table 4: Frequencies distribution of welfare shocks and rural households employment groups in rural Nigeria

Welfare shocks/employment groups	No response	Public	Private formal	Private informal	Self agriculture	Self others	Unemployed	Others	Total
None	737	2336	422	735	9639	4376	169	1814	20228
Agricultural inputs prices too high	531	759	182	425	6715	2690	198	1525	13025
Agricultural inputs not available	231	229	28	197	3229	659	69	492	5134
Low agricultural production	80	69	17	80	1598	354	14	202	2414
Drought	14	12	6	11	194	44	8	32	321
Lack of adequate land	25	40	11	24	381	130	10	63	684
Low prices for agricultural produce	35	49	4	24	829	146	5	87	1179
Lack of market/buyers	31	40	7	14	324	178	3	55	652
Animal deaths from diseases	7	13	1	8	121	26	1	25	202
Lack of capital for agricultural expansion	82	130	24	59	1611	505	23	219	2653
Lack of capital for business	46	100	28	38	491	564	22	125	1414
Lack of credit to start business	27	42	8	9	246	141	7	40	520
Lack of credit to expand business	14	25	7	15	245	187	6	50	549
Lack of employment/jobs	79	157	59	84	873	619	112	226	2209
Low salary	14	573	58	7	35	43	5	32	767
Retrenchment/redundancy	4	3	2	2	36	4	2	10	63
High commodity prices	32	107	20	48	668	395	13	172	1455
Hard economic times	134	301	56	147	1775	954	41	356	3764
Business not doing well	30	26	13	25	150	333	2	26	605
Low profit	12	18	4	7	201	215	0	25	482
Too much competition	4	2	3	3	27	56	0	4	99
Cultural/religious reason	1	2	0	0	11	2	0	1	17
Irregular payment of pension	2	3	1	1	36	7	1	27	78
Delayed payment of gratuity	2	5	1	1	14	0	0	14	37
Others	9	14	3	4	87	67	2	52	238
Total	2183	5055	965	1968	29536	12695	713	5674	58789

affect them most are hard economic times, agricultural inputs not available, lack of employment/jobs, lack of capital for agricultural expansion and low agricultural production. Those with completed primary education experiences other shocks such as hard economic times, agricultural inputs not available, lack of capital for agricultural expansion, lack of employment/jobs, low agricultural production and lack of capital for business. Those with some secondary education experiences other shocks such as agricultural inputs not available, hard economic times, lack of employment/jobs and lack of capital for agricultural expansion. Those with completed secondary education experiences other shocks such as hard economic times, agricultural inputs not available, lack of employment/jobs and lack of capital for agricultural expansion. Among those with post secondary education other shocks that they experiences most are low salary, hard economic times, lack of employment/jobs and agricultural inputs not available.

In the Table 4, the shock with the highest effect across the various employment groups is agricultural input too high. Also, those that are self employed in agriculture experiences the highest effect of the various shocks except for low salary and business not doing well. Other shocks common to those in the public sector are low salary, hard economic times and agricultural inputs not available. Those that are employed in the private formal sector experiences other shocks such as lack of

employment/jobs, low salary and hard economic times. Agricultural inputs not available, hard economic times, lack of employment/jobs and low agricultural production are main idiosyncratic shocks affecting those in the private informal sector.

Other idiosyncratic shocks common to those that are self employed in agriculture are agricultural inputs not available, hard economic times, lack of capital for agricultural expansion and low agricultural production. Those that are self employed in other economic activity experiences other shocks such as hard economic times, agricultural inputs not available, lack of employment/jobs and lack of capital for business. The unemployed experiences other shocks such as lack of employment/jobs, agricultural inputs not available and hard economic times.

Across the various employment groups the most common idiosyncratic shocks are agricultural input too high, hard economic times, agricultural inputs not available and lack of employment/jobs.

Multidimensional decomposition across welfare shocks:

Table 5 shows the multidimensional decomposition across the house head experience of welfare shocks. The welfare shock lack of adequate land has the highest average multidimensional poverty of 0.4244. The welfare shock of irregular payment of pension has the lowest average multidimensional poverty of 0.3282. The welfare shocks

Table 5: Multidimensional deprivation decomposition across welfare shocks

Welfare shocks	Frequency	Average multidimensional poverty		Absolute contributions	Relative contributions
		poverty	SD		
None	20228	0.3412	0.1046	30.6689	0.1174
Agricultural inputs prices too high	13025	0.4131	0.1029	24.9135	0.0915
Agricultural inputs not available	5134	0.3950	0.1001	25.3506	0.0345
Low agricultural production	2414	0.4065	0.0996	24.4996	0.0167
Drought	321	0.4104	0.1060	25.8346	0.0022
Lack of adequate land	684	0.4244	0.1017	23.9618	0.0049
Low prices for agricultural produce	1179	0.4026	0.1016	25.2351	0.0081
Lack of market/buyers	652	0.3977	0.1049	26.3776	0.0044
Animal deaths from diseases	202	0.4111	0.0858	20.8738	0.0014
Lack of capital for agricultural expansion	2653	0.4017	0.1001	24.9303	0.0181
Lack of capital for business	1414	0.3803	0.0990	26.0327	0.0091
Lack of credit to start business	520	0.3788	0.0947	24.9974	0.0034
Lack of credit to expand business	549	0.3997	0.1024	25.6304	0.0037
Lack of employment/jobs	2209	0.3960	0.1012	25.5572	0.0149
Low salary	767	0.3410	0.0932	27.3251	0.0044
Retrenchment/redundancy	63	0.4024	0.1026	25.4957	0.0004
High commodity prices	1455	0.3767	0.0975	25.8699	0.0093
Hard economic times	3764	0.3905	0.0987	25.2710	0.0250
Business not doing well	605	0.3774	0.0964	25.5369	0.0039
Low profit	482	0.3898	0.1064	27.2855	0.0032
Too much competition	99	0.3434	0.0885	25.7699	0.0006
Cultural/religious reason	17	0.3615	0.0742	20.5224	0.0001
Irregular payment of pension	78	0.3282	0.0896	27.3118	0.0004
Delayed payment of gratuity	37	0.3308	0.0852	25.7679	0.0002
Some other reasons	238	0.3798	0.0909	23.9327	0.0015
Total	58789	0.3796	0.1065	28.0541	0.3796

F ratio = 112.202***

Table 6: Multidimensional poverty decomposition across the house heads coping methods

Groups	Frequency	Mean	SD	CV	Absolute	Relative
None	3521	0.3659	0.1347	36.8118	0.0219	5.7740
Piecework on farms that belong to other households	10130	0.4066	0.1051	25.8383	0.0701	18.4584
Other piece works	7889	0.3709	0.1028	27.7036	0.0498	13.1126
Working on food for food program	1244	0.3835	0.1059	27.6112	0.0081	2.1378
Relief food from government	489	0.3932	0.1022	25.9949	0.0033	0.8616
Eating wild food	1515	0.3996	0.1048	26.2279	0.0103	2.7126
Substituting ordinary meals with fruits	3541	0.3926	0.1073	27.3316	0.0236	6.2291
Reducing number of meals	8446	0.3800	0.1006	26.4648	0.0546	14.3827
Reducing other household items	3251	0.3668	0.1007	27.4555	0.0203	5.3443
Informal borrowing	5164	0.3704	0.1018	27.4800	0.0325	8.5715
Formal borrowing	688	0.3488	0.1077	30.8722	0.0041	1.0755
Church charity	259	0.3641	0.1159	31.8233	0.0016	0.4226
Withdrawal of children from school	282	0.4093	0.0972	23.7475	0.0020	0.5173
Sale of assets	2992	0.3662	0.1003	27.3772	0.0186	4.9099
Petty trading	3786	0.3578	0.0973	27.1936	0.0230	6.0705
Asking from friends, neighbors etc.	4809	0.3784	0.1070	28.2726	0.0309	8.1537
Begging from the streets	145	0.4270	0.1021	23.9147	0.0011	0.2775
Other forms of coping	638	0.3458	0.1093	31.6030	0.0038	0.9886
Total	58789	0.3796	0.1065	28.0541	0.3796	100.0000

Extracted by the Author from the 2006 CWIQ data

that also have high average multidimensional poverty are: too high prices of agricultural inputs, death of animals due to diseases, drought, low agricultural production, low prices for agricultural produce, retrenchment/redundancy and lack of capital for agricultural expansion. The corresponding value of their average multidimensional poverty is 0.4131, 0.4111, 0.4104, 0.4065, 0.4026, 0.4024 and 0.4017. The highest variability index is observed in those that do not specify the welfare shock they experienced, while the lowest variability index is observed in those that

specified that cultural/religious shock was the welfare shock they experienced. Those that do not specify any welfare shock have the highest absolute and relative contribution to multidimensional poverty of 0.12 and 30.93%, respectively. The welfare shock cultural or religious reason has the lowest absolute and relative contribution to multidimensional poverty of 0.0001 and 0.03%, respectively. It is also observed that too high prices of agricultural inputs account for high absolute and relative contribution to multidimensional poverty

(0.09 and 24.11%). Table 6 shows the multidimensional poverty decomposition across the house heads coping methods against poverty. Those that resorts into begging from the street to enable them cope with the scorch of poverty have the highest average multidimensional poverty of 0.4270. The lowest average multidimensional poverty of 0.3458 is recorded in those that adopt other form of coping methods against poverty.

The variability index of the coping methods with highest and lowest average multidimensional poverty is 23.91 and 31.60%. The highest and lowest variability index of 36.81 and 23.75% is observed in those that do not have any coping methods and those that withdraw their children from school. Those that work on the farm belonging to other households have the highest absolute and relative contribution to multidimensional poverty of 0.0701 and 18.46%. Those that beg from the streets have the lowest absolute and relative contribution to multidimensional poverty of 0.0011 and 0.28%. Other coping methods that have high absolute and relative contribution to multidimensional poverty are those that reduce the number of their meals and those that take up other pieces of work. Their absolute and relative contributions are 0.0546, 0.498, 14.38 and 13.11%.

CONCLUSION

The main shock experienced by the rural household heads is high prices of agricultural inputs. This shock is most felt in the North East and South South Nigeria. The shocks that affected the aged were irregular and delayed payment of pension and gratuity.

Those that are multidimensional poorer experiences shock of lack of adequate land. Most of the rural household heads usually cope with poverty by working on farms that belong to other households. The household heads that begged on the street in order to cope with poverty were multidimensional poorer than those that adopted other coping methods.

In order to reduce the shocks experienced by the rural households, the government should subsidize the prices of agricultural inputs so that the prices of these inputs will be relatively stable. The government should ensure that land is available at lease for farming. The government should embark on programs that would alleviate the poverty level of street beggars.

REFERENCES

Aigbokhan, B.E., 2000. Poverty, Growth and Inequality in Nigeria: A Case Study. AERC, Nairobi, Kenya.

- Alayande, B. and O. Alayande, 2004. A quantitative and qualitative assessment of vulnerability to poverty in Nigeria. Being a Paper Submitted for Presentation of CSAE Conference on Poverty Reduction, Growth and Human Development in Africa, March, 2004. <http://www.csae.ox.ac.uk/conferences/2004-GPRaHDiA/papers/4p-Alayande-CSAE2004.pdf>.
- Ayoola, G.B., Aina, B. Mamman, N. Nweze and T. Odebiyi *et al.*, 2000. NIGERIA: Voice of the poor. World Development Report 2000/2001 Consultation with the Poor. <http://siteresources.worldbank.org/INTPOVERTY/Resources/335642-1124115102975/1555199-1124138866347/nigeria.pdf>.
- Betti, G., B. Cheli, A. Lemmi and V. Verma, 2005. The fuzzy approach to multidimensional poverty: The case of Italy in the 90s. Presented at the International Conference on The Many Dimensions of Poverty, Brasilia, Brazil, 29-31 August.
- CBN, 2005. The conduct of fiscal policy. <http://www.cenbank.org/monetaryPolicy/Fiscal/2004.asp>.
- Cerioli, A. and S. Zani, 1990. A Fuzzy Approach to the Measurement of Poverty. In: Income and Wealth Distribution, Inequality and Poverty, Dagum, C. and M. Zenga (Eds.). Springer Verlag, Berlin, pp: 272-284.
- Christiaensen, L. and K. Subbarao, 2001. Towards and Understanding of Vulnerability in Rural Kenya. Mimeo, USA.
- Costa, M., 2002. A multidimensional approach to the measurement of poverty: An integrated research infrastructure. The Socio-Economic Sciences IRISS Working Paper Series No. 2002-05.
- Costa, M., 2003. A comparison between unidimensional and multidimensional. Approaches to the Measurement of Poverty An Integrated Research Infrastructure in the Socio-Economic Sciences IRISS Working Paper Series No. 2003-02.
- Dagum, C., 2002. Analysis and measurement of poverty and social exclusion using fuzzy set theory. Application and policy implication. <http://www.s-a-e.org.ar/dagumcon.pdf>.
- Dercon, S., 2004. Insurance Against Poverty. Oxford University Press, Helsinki.
- Duetsch, J. and Silber, 2005. Measuring multidimensional poverty: An empirical comparison of various approaches. Rev. Income Wealth, 51: 145-174.
- Holzmann, R. and S. Jorgensen, 2001. Social risk management: A new conceptual framework for social protection and beyond. Int. Tax Public Fin., 8: 529-556.
- Martinetti, E.C., 2000. A multidimensional assessment of well-being based on sen's functioning approach. Societa Italiana Di Economia Pubblica Working Paper. http://www-3.unipv.it/iuss/CDs/userfiles/file/Papers/paper_chiappero_1.pdf.

- Mussard, S. and M.N. Pi Alperin, 2005. Multidimensional decomposition of poverty: A fuzzy set approach. Proceedings of the International Conference in Memory of Two Eminent Social Scientists C. Gini and M.O. Lorenz, May 23-26, Siena, Italy, pp: 1-26.
- Okunmadewa, F., 2002. Poverty and Agricultural Sector in Nigeria. In: Poverty Reduction and the Nigeria Agricultural Sector, Okunmadewa, F. (Ed.). Elshaddai Global Ventures Ltd., Ibadan.
- Rural Poverty Portal, 2008. Rural poverty in Nigeria. <http://www.ruralpovertyportal.org/english/regions/africa/nga/index.htm>.
- Sen, A.K., 1985. Commodities and Capabilities. Amsterdam, North-Holland.
- Sen, A.K., 1987. The Standard of Living. Cambridge University Press, Cambridge, UK.
- Zadeh, L.A., 1965. Fuzzy set. Inform. Control, 8: 338-353.