

Rising Food price, Consumption inequality and Welfare status of Agricultural households in Nigeria

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Abstract

Food price change and Consumption inequality can hamper livelihood outcomes, hurt social cohesion, sometimes fuel conflicts and frustrate efforts of social intervention programme. Therefore, it pulses intricacies to achieve the SDGs. The study with distinctive preferences aimed at evaluating the heterogeneous effects of food price changes, consumption inequality and households' welfare in Nigeria, assessing whether consumption inequality reduces with change in food price and if there is improvement in households' welfare status with these effects. Data from the National Bureau of Statistics (NBS) with appropriate methodology was used to elicit the needed information that provoke promotion of adequate welfare policy in Nigeria. The Gini coefficient was found to be between 0.374 and 0.426, with the minimum in the first quintile and the maximum in the fifth. It is evident that consumption inequality is higher among the lowest income households than high income households. Gini index negatively related to welfare status. Also, age with positive relationship depicted increase in likelihood of welfare status with increase in age. Results show that bigger households are more likely to be poor than smaller households. The coefficient of household size shows reduction in the chances of improved welfare status of the households. Conclusively, rising food price has become a subject of worries, as it widens consumption inequality gap, hurt social cohesion and invariably affect the livelihood outcome of most agricultural households.

Keywords: Consumption, Gini index, sub-Sahara Africa, SDGs, Quintile

Introduction

Reduction of inequality is vital to development goals. Rise in food prices in developing world have raised considerable concerns about the welfare of poor households for whom food represents a substantial share of consumption and who might be already at levels of consumption close to subsistence. The implications that deterioration in nutrition and food security might have even in the long run made this problem very pressing and the consideration of appropriate policy responses urgent. From projection, about 630 million people in the world are expected to be living in poverty at the end of 2022. Despite reports on the drop of the number living in poverty from the 1990s and 2015, many people are still struggling to escape the poverty thresholds (SDGs, 2023). Poverty affect both developed and developing economies. United Nation (UN) report have it that more than 30 million children are suffering in the developed economies. Achieving the SDGs I, is vital to development in sub-Sahara Africa, Nigeria inclusive. Threat to this could arise a matter of many factors – economic, institutional, natural and so on. Upsurges in price of food items create a covariate shock, that will affect all facets of household livelihoods, if it persists over time. The contribution of food price changes to consumption expenditure is vital

and need a robust measure which are somehow dearth in literature. Though, the impacts of high food prices on disposable incomes and welfare (see World Bank 2009) depend on factors such as food income of buyer and sellers, source of income, some demographic variables of households and on the structure or balance of the economy. The relative position of households in the food market appears to be among the critical factors expected to determine the improvement or not of the household welfare while the effect of price increase on country will depend whether the country is net food importers or net food exporters.

Consumption inequality varies between countries with time-varying. It is a subject of worry to government and policy makers. In fact, Covid – 19 aftermath effect poses a serious threat on inequality reduction within and between countries (SDGs, 2023), the number of the extreme poor rises by 27 – 40 million in sub-Sahara Africa (Poverty and Shared Prosperity report 2020, cited by Saidi *et al.*, 2023). The background understanding of inequality indices is not the only concern. It is also important to know the distribution and decomposition of the total inequality into diverse subgroups so that policy makers can develop knowledge and clue to regulate main components in inequality reduction. The measure of inequality is paramount to policies towards growth, inequality reduction, redistribution policy and poverty. While a number of studies have been conducted on inequality, it has been noted that most of them focus mainly on income inequality and poverty (see Ferreira and Ravallian, 2013; Foster *et al.*, 2013). However, these studies were unable to incorporate how tenacious price increase influences consumption pattern and inequality as they are affected by various components which are either generated or promoted through income. Therefore, there is need to evaluate the heterogeneous effect of food price change and consumption inequality on households' welfare.

Literature review

For many households, the main source of consumption inequality is from varying non-food expenditure of these households (Nwosu *et al.*, 2018). Non-food expenditures in terms of education, energy, health, accommodation, and water and sanitation. A few prior studies (Nicholson, 2001; Adekunle *et al.*, 2020; Olaoye *et al.*, 2023) have use microdata to examine price changes and households' welfare. These studies pivoted on the use of compensating variation in measuring households' welfare. The important problem in welfare economics is to devise a monetary measure of the gains and losses that individuals experience when prices change. This is important for economic policy because usually economist would design policies that maximize consumer welfare. The modified concept of compensating variation was developed by Minot and Goletti (2000). This evaluation of welfare and distributional impacts of price changes looks at measures of Compensating Variation. Compensating Variation is the amount of money sufficient to compensate households following price changes and enable them to return to the initial levels of utility (Benfica, 2012).

Changes in food prices affect poverty and inequality through consumption and income channels. On the consumer side, as food prices increase, the monetary cost of achieving a fixed consumption basket increases hence reducing consumer's welfare. However, for the segment of the population whose income depends directly or indirectly on agricultural markets (i.e. self-employed farmers, wage workers in the agricultural sector, and rural land owners) the rise in food prices represents an increase in their monetary income. The actual benefits for them of higher food prices may be less than expected because benefits depend not on what they produce

but on their net sales of these products. And many of them buy to make up for the deficit in production relative to household consumption.

The Money Metric Welfare Index

This leads us to the basic concept of Money Metric Welfare Index (MMWI) of agent a . Formally:

The Money Metric Welfare Index (MMWI) of agent a , $m^a(p, P, y, z)$, is defined by:

$$v^a(p, P, m^a(p, P, y)) = V^a(p, P, y) \quad (1)$$

Equivalently, if c^a denotes the expenditure function of agent a , then:

$$m^a(p, P, y) = c^a(p, P, V^a(p, P, y)) \quad (2)$$

M^a is, in other words, the monetary sum that agent a would need to achieve the utility level $V^a(p, P, y)$ if she were to pay the entire cost of each public good (i. e. , if she faced the price vector P instead of the personalized prices P^a). In contrast to the GSR, the Money Metric Welfare Index provides a complete description of the agent's utility level. That is, knowing an agent's preferences, there is a one-to-one relationship between her utility and her MMWI, and this relationship is unaffected by the partner's traits.

At this time, a few comments can be made. First, the MMWI aligns with the sharing rule when there are no public goods. To put it another way, the MMWI is a comprehensive measure of individual well-being that aligns with the natural concept (i. e. the sharing rule) in the (largely studied) instance of private consumption and expands it to include household public spending. A second observation is that the MMWI relies on the price vector employed as a reference in the presence of public goods. Although utilizing the market price as a benchmark is a simple approach, it is not the only one. The possibility that this selection may impact the very direction of intra-household inequality is even more noteworthy. For example, it is simple to create instances where member A's MMWI is higher than B's for some prices but lower for others.

Third, the previous definition contrasts the utility currently achieved by a married person with the utility the same individual (i. e. , with the same preferences) would attain in the hypothetical circumstance where they would have to pay market prices for public goods (in which case the chosen consumption bundle would obviously be quite different). In this hypothetical scenario, one may be inclined to believe that the person is single. However, this explanation is not only necessary but also potentially deceptive since it presupposes that marriage has no effect on preferences, which is not at all evident. Finally, the MMWI is directly related to the popular idea of equivalent income (Fleurbaey et al., 2023). Both methods are based on the premise that interpersonal welfare comparisons can be made easier by reference to a shared price vector. To the best of our knowledge, however, equivalent income has only ever been utilized for private items. Here, our main argument is that the idea of Lindahl prices may be applied to the scenario of public consumption, which offers a logical answer to a recurring and somewhat challenging issue.

Methodology

The study Area:

The study was carried out in Nigeria. There are six geopolitical zone in the country (North Central, North-west, North-east, South-west, South-east and South-South). These zones are embroidered with different agro ecological atmosphere: Rainforest, Mangrove swamp, Guinea savannah, Sahel savannah and Sudan savannah. Nigeria is a multi-ethnic nation with more than 250 tribes and languages. Aside, the diversity in cultural heritage, its large cultivable land also benefits production of food crops (cereals, vegetables, spices, legumes etc.) and tree crops (cocoa, rubber, Kolanut, etc.).

Data Source:

To understand how food price change and households' expenditure translate to inequalities and well-being, the study used the popular household (Generalized Household Survey, GHS) data and the retail commodity prices across the panel of 36 states and Federal Capital Territory (FCT). A secondary data obtained from the National Bureau of Statistics (NBS). GHS is a nationally representative survey of about 5000 households. Real consumption was the main variable to measure the inequality. Meanwhile, both consumption on durable, transfer and own production was captured. The study employed the approach of Deaton (2003) – dividing the household consumption by adult equivalent. Basically, the study was anchored on the use of Total Consumption Expenditure Per Adult Equivalence to estimate inequalities. Consumption inequality was established using different and major approaches to measure inequality – Gini Index, Generalised Entropy Index with parameter 0 and 1 (Theil's L and Theil's T).

Food expenditure and consumption data were gathered over a 7-day recall period, whereas expenditure data for some nonfood items were either reported weekly and monthly (for frequent nonfood purchases) or over a 6-month or 1-year period (for non-frequent non-food purchases). The weekly food consumption/acquisition data was discounted for consistency. The value of all the food eaten by a family was determined by extrapolating from the comparable cost of the food that was bought.

The NBS also gathers retail prices for particular foods across the nation's 36 states, as well as in months and years that coincide with the household panel survey. The food products that are brought in include imported rice, local rice, maize, sorghum, millet, beef (meat), fish, eggs, yam, garri, beans, and palm oil. Because they make up essential elements of home diets, these particular foods are essential for the nation's household food security. Others are consumer (Laspeyres) price indexes that the National Bureau of Statistics (NBS) had previously calculated on a monthly and annual basis for food and non-food products at the national level, in accordance with the household survey. Food items were categorized into twelve (12) groups in order to create a measure of dietary diversity: fish/sea foods, cereals, pulses, tubers, beverage, egg, milk and dairy, fruits, meat, fat & oil, sweeteners, and other non-durables (Olaoye et al. , 2023). In addition to food products, non-food products were classified into two categories: commonly bought nonfood items and rarely purchased non-food goods.

Household Welfare

This research utilizes compensated variation to assess the well-being of households. Compensated variation refers to the financial amount necessary to offset the impact of price changes on households, helping to bring them back to their previous level of satisfaction. The indirect utility function V allows for the implicit definition of compensating variation:

$$v(x^o + cv, p_c^i) = v(x^o, p_c^o) \dots \dots \dots (v)$$

where x represents household expenditure, CV is compensating variation and p_c is a vector of prices for consumer goods. The subscripts (0) and (1) refer to initial period and period after price change, respectively. The expression for CV in equation (above) can be re-expressed using the expenditure (or cost) function $e(p, u)$ where u is utility, as follows:

$$CV = e(p_c^1, u^o) - e(p_c^o, u^o) \dots \dots \dots (vi)$$

where the second term in the right hand side is defined as a profit function after changes in the price of produced good and p_p is a vector of prices for produced goods. Equation (vi) yields the total amount of money need to maintain the previous utility after change in prices of goods.

Results and Discussion

Summary, descriptive statistics

We present the socioeconomic/demographic characteristics and the living condition variables of the respondents by the classification of the respondents based on their income level. The respondents were classify into five(5) different quintile. The quintile from 1 - 5 represents from the poorest to the richest households' respectively. The result presented on Table 1 revealed the composition of the household head by sex. The result of the pooled data showed that 74.49% of the household head were male while 25.51% were female. We can observe the prominence of male-headed households over female. Family structure in Nigeria is a pointer to this dominance, since we have family structure which male are considered the head of the family. Fewer female headed household might be as a result of loss of the male head or the female-head being widow, divorce and or separated. Considering the decomposed data, we have 76.21%, 73.26%, 76.09%, 72.08% and 68.31% of the respondents were male for the first to the fifth quintile respectively. This relatively indicated that we have more male household head than female counterpart.

From the aggregated data, the result showed that most (80.86%) of the sampled respondents were married, 15.61% widowed, 2.26% were separated, 0.9% were divorced and only 0.37% were never married. Since, most of the respondents were married, we assume improvement in households' welfare because of the likelihood of multiple source of income especially from both spouse. The result of the dis-aggregated date still revealed the dominance of married household heads with the following percentage 82.61%, 72.87%, 82.68%, 80.50% and 92.18% for quintile 1 - 5 respectively. From this result, one could observed that the percentage of married were higher among respondents in the 5th quintile than the 2nd quintile.

Also, the aggregated data revealed that about 36% of the respondents had no education of any form, 28.41% had post secondary school education, 15.3% had only primary school education, 9.59% of the respondents had only secondary school education, while 7.82% had adult education. Education play significant role in determining households consumption pattern. Authors says that most poor consumes more of carbohydrate while increase income will command consumption of more protein. The result here showed that most (48%) of the respondent in quintile 5 had post secondary school education. From this result, most of the households across the quintile had formal education and this could promote consumption expenditure of the households.

Equally, we have on the table the distribution of the respondents based on the means and methods of acquiring start-up capital. The result revealed to us in the aggregated data that large (59.76%) of the respondents acquire their start-up capital from the household personal saving -

an informal way of credit/capital acquisition. The trend was also observed within all the 5 quintile, where no quintile recorded less than (55%) of the respondents having their start-up capital from this source. Other informal source of start-up capital are: Money lender (8.72%), Esusu/Adashi(5.12%), Districts & town association (0.22%). Meanwhile, a small portion of the respondents access the start-up capital from cooperative societies (2.28%). This showed dependence of most respondents on informal sources of acquisition of start-up capital.

Furthermore, the result as presented on the table showed about 25% of the respondents on the aggregated data to have aged more than 60 years. 22.68% age lies within age 41 and 50 years, more than 21% of the respondents have their age ranged between 51 - 60. The mean age of the respondents on aggregated data was about 54 years. This indicated a mid age range. The respondents are still active and agile within the labour force; possess the vitality to influence their consumption expenditure and pattern.

Base on the distribution of the households according to their occupation, the aggregated data revealed that 37.8% of the households are farm families. Though, most farming households dwells in rural area where land is available for crop production when compare to urban area. Also, slightly more than 32% of the respondents are artisans; 13.74% of the respondents claimed to be civil servants while 13.33% were trading and 2.72% were professionals. The result indicated that most of these respondents have either skilled or unskilled job(s) to cater for their family welfare. In other class, we have more than 55% of those in quintile 4 as farmers while about 40% of respondents in quintile 5 are artisans, 53.17% of respondents in quintile 1 are farmers and about 39% and 37% of those in quintile 2 and 3 are artisans respectively.

Lastly, the distribution of the households based on their size was described on the table, the aggregated data of the findings revealed that most (43.07%) of the households had family size which lies between 6 - 10 members. About 35% had a family size that are not more than 5 members while 22.% had more than 10 members. The average household size of the pooled data was about 8 persons. This indicated that most households in the study area have a fairly large households. From the table, it could be observed that higher percentage of the households size with not more than 5 members were recorded for quintile 4 and 5. This is an evidence that most family within the lower quintile had more household members than those in the higher quintile. Poverty, food insecurity, poor well-being may abound in these lower quintile there is higher likelihood for those quintile to improve well-being of their members.

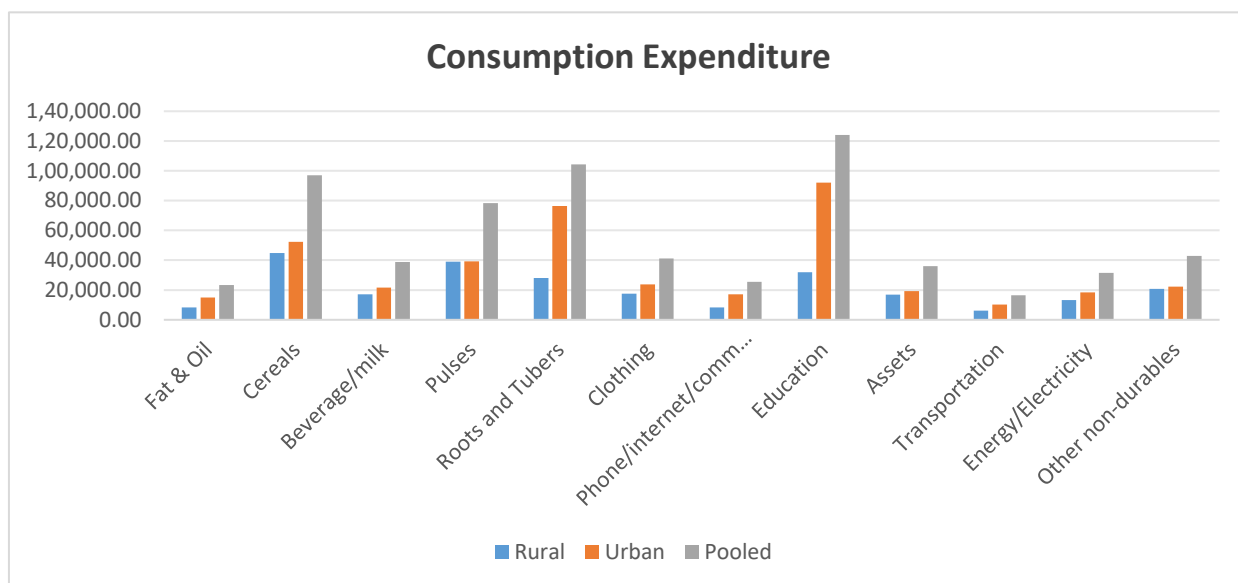


Figure 1: Decomposed household consumption expenditure

Food and Non-food consumption pattern

At this stage, we attempt to construct food and non-food consumption expenditure of the households. As we have it on the Table 2 below, we grouped both food and non-food households spending to 10 classes. These include: Cereals, Fat & oil, Beverage/milk, Pulses, roots and tubers, clothing, Phone/internet/communication gadgets, Education, Transportation, Energy/Electricity, Other non-durables and capital assets. It is clear that households spending on education amount to the largest share of the expenditure. The cost expended on education is higher than any other cost according to this estimate. At this level, households spending on education start from preschool (kindergartens) to higher degree level. Also, roots and tubers consumption accounted for about 16% of the total expenditure. Such class of food are potatoes, cassava, yam, cocoyam and so on. It constitute part of households diet and contribute significantly to food security.

Cereals consumption accounts for about 15% share of the total expenditure. Cereals (Sorghum, Millets, Wheat, Maize and Rice) are staple food of most households in the study area, consumed by people with varying food preferences and socioeconomic backgrounds. Some of these cereals has become strategic and priority commodity for households food security. In which, consumption is growing faster than any other staple as a result of preference, population growth, change in eating habit and rapid urbanization (Seck et al., 2013). Households consumption of pulses was also significant. Interestingly, the result showed percentage share (11.87%) to total expenditure. This indicated that the commodity form part of the high ranked households food commodities. It constitute part of households diet as it is the major source of protein. Other food spending are categorized as fat & oil and beverages/milk. These two have a share of 5.89% and 3.53% of the total expenditure respectively. In the category of non-food spending, excluding education which is primal to households expenditure. Others include, Other

non-durables with 6.51% share, Clothing with 6.25% share, assets (5.47%), energy (4.78%), Phone/internet/communication gadgets (3.87%) and transportation with 2.48% share.

Driven by disparity in food consumption between rural and urban areas, as noted in figure 2, we investigate the underlying reasons for this difference in more depth. In particular, using the Blinder-Oaxaca decomposition approach, we want to determine if households in different income level has a significant impact on food consumption expenditures. The decomposition results demonstrate that there is a large and notable disparity or gap in food consumption between households within these income level in Nigeria and most difference in spending is due to differences in education (Table 2). As a result, the average food consumption expenditure would have increased if all households across the income level have the same characteristics. Conversely, if the characteristics varies across the income level as it was now, the average amount spent on both food and non-food items will continue to increase at the same rate.

Consumption Inequality

Here, the households were classified into five groups based on their income, which served as the foundation for the analysis. In Table 3, Quintile 1 is the richest while quintile 5 represent the poorest. By examining household income through quintiles as displayed in figure 2, the research revealed that there is consistency in consumption distribution within each quintile. The findings included the Gini coefficient for each quintile, along with the generalized entropy measures at levels 0, 1 and 2, as well as the GE Theils T and GE Theils L values. The Gini coefficient was found to be between 0.374 and 0.426, with the minimum in the first quintile and the maximum in the fifth. It is evident that consumption inequality is higher among the lowest income households than higher income households. When more emphasis was placed on the consumption distribution distance within each quintile, the values were 0.311 for the fourth quintile with a weight of 2 and 0.248 for the first quintile. The Theils T values were recorded at 0.341, 0.362, 0.384, 0.386, and 0.392, indicating that 34.1%, 36.2%, 38.4%, 39.2%, and 37.3% of the total inequality among respondents in the first to fifth quintile is due to their overall income, respectively. Nwosu et al., (2018) showed that consumption inequality is higher in rural than urban area with record of higher non-food expenditure having the greater percentage of the variation than food expenditure. The decomposition also show that within-group inequalities for non-food and food expenditure are, respectively, 0.97 and 0.365 using the Theil index, while between-group inequalities for non-food and food are, respectively, 0.016 and 0.035.

Table 3: Decomposition of inequality by Quintile

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Gini (coefficient)	0.374	0.381	0.386	0.393	0.426
Generalized Entropy ($\alpha=0$)	0.142	0.148	0.152	0.155	0.161
($\alpha = 1$)	0.201	0.216	0.219	0.224	0.243
($\alpha = 2$)	0.248	0.251	0.263	0.311	0.314
GE Theils T	0.341	0.362	0.384	0.386	0.392

GE Theils L	0.299	0.303	0.306	0.308	0.309
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Source: Authors' computation, 2024

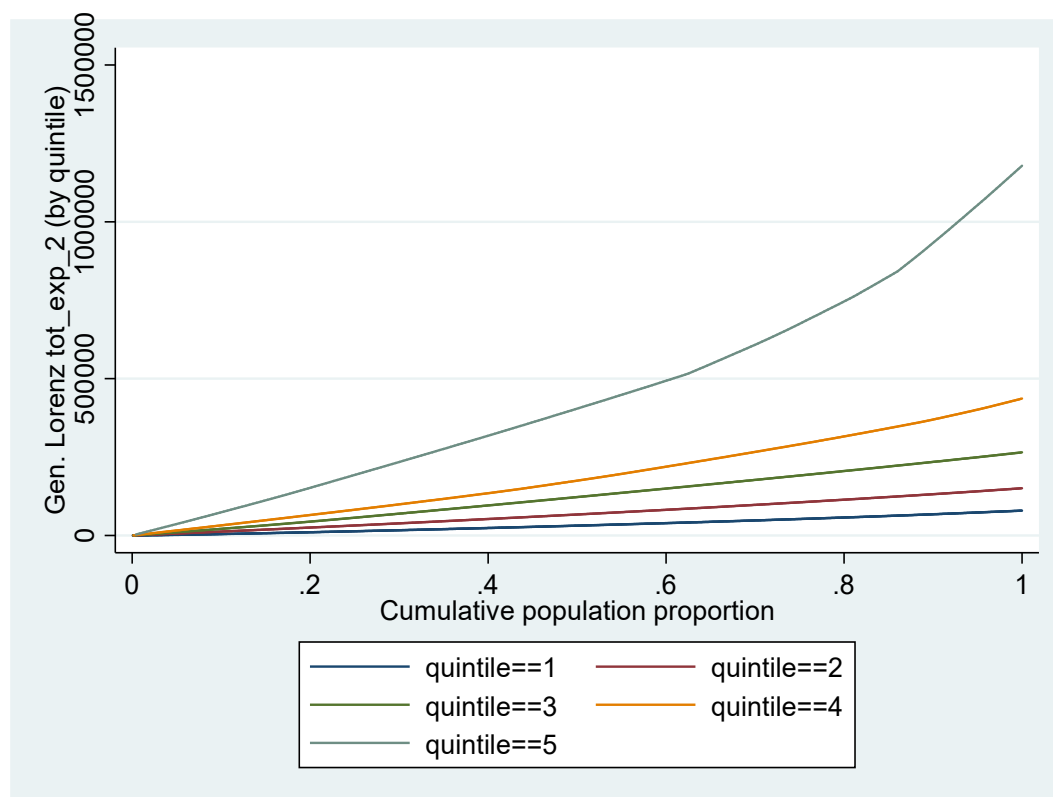


Figure 2: Generalized Lorenz curve showing consumption inequalities based on the quintile

Effects of consumption inequality on welfare status

To show the effect of consumption inequality on welfare status of the households in the study area. The study adopted 2 - SLS to consider bias estimation and check endogeneity issue. On top of it, having consciousness of minimizing bias and confidence intervals with better coverage rate, we used the Limited-information maximum likelihood (LIML) estimator instead of the prominent maximum likelihood estimate (MLE) (Poi 2006; Stock et al., 2002). We found education to be endogenous and further check for weak instrument and over-identification restriction as suggested by . From the result in Table 5, Gini index negatively related to welfare status. This indicated that as inequality increases there will be reduction in welfare status of the respondents. Age with positive relationship depicted increase in likelihood of welfare status with increase in age. That is, the welfare status is due to improve as the respondents get older. Further, the contribution of households size to livelihood outcomes of people is critical and need a due diligence in discussing. Reports have shown that bigger households are more likely to be poor than smaller households. The result presented here also showed likes. Having the coefficient of

household size to be negative indicated that it reduces the chances of improved welfare status of the households. More expenditure is expected in a bigger households and at a slight price shock or economic shortfall, the households are at risk of deplorable welfare.

Livelihood outcomes in rural Nigeria requires attention. Both poverty and food insecurity is higher in rural area when compare to the urban. In this study, we also found that living in urban gives a better chance to improved welfare. This might be connected to serial economic activities in urban area which can easily increase household income. Like the a-priori expectation, household with higher income are expected to have better welfare status than those with little or no income. Based on the coefficients of the quintiles 1 - 5. It could observed that the coefficient of the first and second quintile was positive, though insignificant in this model, but it still attest to improved welfare with increase in these. Quintile 3 - 5 showed negative relationship with welfare status, only quintile 3 and 5 were significant. These indicated that households whose income level falls into these categories are at risk of decreased welfare status. That is, there will be decline in welfare status of households whose there income level lies in these group.

Conclusion

Studies on consumption inequality has been gaining wide consideration in research. Most often, most research works were anchored on income and or expenditure inequality. This study employed Total Consumption Expenditure per Adult Equivalence to measure household consumption and used Gini indices estimate the inequality. It is evidence from the result that: (i) consumption inequality in the study area is large and this called for urgent attention of the stakeholders (ii) consumption inequality in Nigeria reduce household welfare. Though, the research doesn't consider the same condition under time watch, but we are able to see the gap as a threat to welfare improvement of households. Both income and expenditure gap plays a vital role in this result (iii) welfare status of households in the study area shows a deprecate sign of deterioration. However, we suggest that consumption inequality must be tackled through economic policies; focusing on reducing the gap must be ensure which will reciprocate in welfare improvement of the households.

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Appendix:

Table 1a: Socioeconomic characteristics of the Respondents

Socioeconomic variables	Pooled Freq(Percent)	Quintile 1 Freq(Percent)	Quintile 2 Freq(Percent)	Quintile 3 Freq(Percent)	Quintile 4 Freq(Percent)	Quintile 5 Freq(Percent)
Sex						
Male	3,393(74.49)	1,310(76.21)	748(73.26)	681(76.09)	488(72.08)	166(68.31)
Female	1,162(25.51)	409(23.79)	273(26.74)	214(23.91)	189(27.92)	77(31.69)
Total	4,555	1719	1021	895	677	243
Age						
≤30	181(3.97)	65(3.78)	88(6.62)	21(2.35)	3(0.44)	4(1.65)
31-40	721(15.82)	205(11.93)	201(19.69)	211(23.58)	61(9.01)	43(17.69)
41-50	1,033(22.68)	397(23.09)	374(36.63)	99(11.06)	115(16.99)	48(19.75)
51-60	973(21.36)	144(8.38)	309(30.26)	241(26.93)	213(31.46)	66(27.16)
Above 60	1,124(24.68)	908(52.82)	49(4.79)	323(36.09)	285(42.09)	82(33.74)
Total	4,555	1719	1021	895	677	243
Marital status						
Divorced	41(0.90)	16(0.93)	11(1.08)	8(0.89)	6(0.89)	0(0.00)
Married	3,683(80.86)	1420(82.61)	744(72.87)	740(82.68)	545(80.50)	224(92.18)
Never married	17(0.37)	6(0.35)	4(0.39)	7(0.78)	0(0.00)	0(0.00)
Separated	103(2.26)	41(2.39)	44(4.31)	23(2.56)	5(0.74)	0(0.00)
Widowed	711(15.61)	236(13.72)	218(21.35)	117(13.07)	121(17.87)	19(7.82)
Total	4,555	1719	1021	895	677	243
Educational level of respondents						
No education	1,653(36.29)	423(24.61)	378(37.02)	439(49.05)	364(53.77)	34(13.99)
Primary education	697(15.30)	455(26.47)	115(11.26)	59(6.59)	34(5.02)	39(16.05)
Secondary education	437(9.59)	253(14.72)	48(4.70)	56(6.26)	41(6.06)	49(20.16)
Religious education	118(2.59)	77(4.48)	27(2.64)	14(1.56)	0(0.00)	0(0.00)
Adult education	356(7.82)	288(16.75)	48(4.70)	16(1.79)	2(0.30)	2(0.82)
Post-secondary education	1,294(28.41)	223(12.97)	405(39.67)	311(34.75)	236(34.85)	119(48.97)

Total	4,555	1719	1021	895	677	243
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Source: Authors compilation, 2025

Table 1b: Socioeconomic characteristics of the Respondents

Variables	Pooled Freq(Percent)	Quintile 1 Freq(Percent)	Quintile 2 Freq(Percent)	Quintile 3 Freq(Percent)	Quintile 4 Freq(Percent)	Quintile 5 Freq(Percent)
Start –up capital of respondents						
Religion body	6(0.13)	2(0.12)	1(0.10)	1(0.11)	0(0.00)	2(0.82)
Cooperative & trade association	104(2.28)	47(2.73)	12(1.18)	36(4.02)	6(0.89)	3(1.23)
Districts & town association	10(0.22)	3(0.17)	3(0.29)	2(0.22)	0(0.00)	2(0.82)
Esusu/Adashi	233(5.12)	107(6.22)	54(5.29)	23(2.57)	33(4.87)	16(6.58)
Household savings	2,722(59.76)	1,014(58.99)	685(67.09)	500(55.87)	380(56.13)	143(58.84)
Money lender	397(8.72)	198(11.52)	105(10.28)	53(5.92)	28(4.14)	13(5.35)
NGO Support	15(0.33)	6(0.35)	0(0.00)	1(0.11)	4(0.59)	4(1.65)
No Response	729(16.00)	311(18.09)	97(9.50)	209(23.35)	98(14.48)	14(5.76)
Relative / friends	325(7.14)	27(1.57)	61(5.97)	67(7.49)	126(18.61)	44(18.11)
Other	14(0.31)	4(0.23)	3(0.29)	3(0.34)	2(0.30)	2(0.82)
Total	4,555	1719	1021	895	677	243
Secondary occupation of respondents						
Farming	1,722(37.80)	914(53.17)	289(28.30)	114(12.74)	375(55.39)	30(12.35)
Civil servant	626(13.74)	145(8.44)	201(19.69)	205(22.90)	44(6.49)	31(12.76)
Artisans	1,476(32.40)	492(28.62)	394(38.59)	333(37.20)	159(23.48)	98(40.33)
Trading	607(13.33)	127(7.38)	113(11.06)	231(25.81)	67(9.89)	69(28.40)
Others (professionals)	124(2.72)	41(2.39)	24(2.35)	12(1.34)	32(1.47)	15(6.17)
Total	4,555	1719	1021	895	677	243
Household size						
<= 5	1,590(34.91)	644(37.46)	188(18.42)	258(28.83)	334(49.34)	166(68.31)
6-10	1,962(43.07)	970(56.43)	422(41.33)	323(36.08)	205(30.28)	42(17.28)
Above 10	1,003(22.02)	105(6.11)	411(40.25)	314(35.08)	138(20.38)	35(14.41)
Total	4,555	1719	1021	895	677	243

Source: Authors compilation, 2025

Table 2: Food and Non-food Consumption pattern

Spending category	Pooled	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Fat & Oil	23,300.56 (3.53)	3,208.36 (13.77)	5,051.38 (21.68)	5,088.51 (21.84)	5,623.22 (24.13)	4,329.09 (18.58)
Cereals	97,001.34 (14.71)	31,047.95 (32.01)	22,889.38 (23.60)	13,669.38 (14.09)	15,009.23 (15.47)	14,385.40 (14.83)
Beverage/milk	38,820.01 (5.89)	3,255.91 (8.39)	3,666.83 (9.45)	6,719.79 (17.31)	11,691.13 (30.12)	13,486.35 (34.74)
Pulses	78,241.33 (11.87)	15,346.16 (19.61)	12,791.7 (16.35)	11,011.42 (14.07)	15,333.93 (19.60)	23,758.12 (30.37)
Roots and Tubers	104,336.23 (15.83)	23,691.01 (22.71)	20,849.77 (19.98)	14,883.92 (14.27)	16,927.47 (16.22)	27,984.06 (26.82)
Clothing	41,222.91 (6.25)	6,188.88 (15.01)	8,514.91 (20.66)	6,849.12 (16.61)	8,327.33 (20.20)	11,342.67 (27.52)
Phone/internet/com munication gadgets	25,535.06 (3.87)	2,333.7 (9.14)	3,605.03 (14.12)	4,934.57 (19.32)	6,335.55 (24.81)	8,326.21 (32.61)
Education	124,001.78 (18.82)	16,392.02 (13.22)	19,239.66 (15.52)	24,943.01 (20.12)	31,463.08 (25.37)	31,964.01 (25.78)
Assets	36,095.71 (5.47)	4,820.19 (13.35)	4,832.78 (13.39)	6,452.99 (17.88)	8,889.09 (24.63)	11,100.66 (30.75)
Transportation	16,377.66 (2.48)	2,094.71 (12.79)	2,774.99 (16.94)	2,391.03 (14.60)	4,003.46 (24.44)	5,113.47 (31.22)
Energy/Electricity	31,523.72 (4.78)	4,171.64 (13.23)	5,165.93 (16.39)	6,828.36 (21.66)	7,352.08 (2332)	8,005.71 (25.40)
Other non-durables	42,881.43 (6.51)	6,338.63 (14.78)	7,444.51 (17.36)	7,005.81 (16.33)	8,863.99 (20.67)	13,228.6 (30.85)

Source: Authors' computation, 2024

Not: Percentage share in parenthesis

Table 4: Effects of consumption inequality on welfare status of the households (per capita real expenditure)

Variables	2SLS	Quintile 1 dy/dx(S.E)	Quintile 2 dy/dx(S.E)	Quintile 3 dy/dx(S.E)	Quintile 4 dy/dx(S.E)	Quintile 5 dy/dx(S.E)	Pooled dy/dx(S.E)
Gini index	-0.8849 (0.3747)**	0.9983 (0.6653)	0.0871 (0.0516)*	-0.2291 (0.2566)	0.0205 (0.0090)**	0.0434 (0.0190)	0.2570 (0.1306)**
Age	0.0303 (0.0148)**	0.5271 (0.2623)**	0.1209 (0.2101)	0.2829 (0.2033)	0.0504 (0.0523)	0.0582 (0.0255)**	0.0432 (0.0252)
Sex	0.0019 (0.0022)	0.0354 (0.0426)	0.1431 (0.0655)**	0.0199 (0.0244)	0.1280 (0.0512)***	0.0219 (0.0295)	0.0381 (0.3177)
Social Group	0.0048 (0.0056)	0.4374 (0.4624)	0.1454 (0.0609)***	0.3428 (0.2700)	0.2115 (0.1174)*	0.1782 (0.0714)***	0.2285 (0.4896)
HH_ Size	-1.4514 (0.3652)***	0.0134 (0.0141)	0.0642 (0.1992)		0.0414 (0.0236)*	0.0666 (0.0374)	0.0205 (0.0090)**
Marital status (dummy)	0.0760 (0.0490)		0.4470 (0.7552)	0.6457 (0.3388)**	-0.0357 (0.0352)	0.2457 (0.1393)*	0.03035 (0.0137)**
Own Livestock	0.0593 (0.0174)***	0.1525 (0.0607)***	0.7289 (0.4583)	0.1119 (0.1182)	0.0640 (0.0237)	0.4048 (0.1841)**	-0.0101 (0.0969)
Urban (dummy)	0.2051 (0.1048)**	0.5031 (0.2061)***	-0.9561 (0.6856)	0.2080 (0.2239)	0.1725 (0.0940)*	0.5988 (0.1817)***	0.5851 (0.2928)**
Agricultural households	-0.1759 (0.2213)	0.0910 (0.0374)	0.0181 (0.0271)	0.2039 (0.0680)***	0.1113 (0.1614)	0.0066 (0.0445)	0.6978 (0.2188)***
Safety Net	0.0983 (0.1368)	0.4470 (0.7552)	0.4029 (0.1993)**	0.4857 (0.2102)**	0.7308 (0.3680)**	0.0457 (0.0333)	0.4932 (0.1759)***
Receive-Remittance	0.0608 (0.1454)	0.2039 (0.0680)***	0.0273 (0.0236)	0.0633 (0.2479)	0.2466 (0.4713)	-1.0221 (0.4024)***	0.3706 (0.1863)**

Education	-0.1557 (0.0452)***	0.0009 (0.0369)	0.0230 (0.0043)***	0.0154 (0.0074)**	0.0024 (0.0110)	-0.0028 (0.0032)	0.0315 (0.0326)
North Central zone	-0.1666 (0.2534)	0.0433 (0.0365)	0.0759 (0.0463)	0.0982 (0.0407)***			0.7681 (0.3210)**
South South zone	-0.6992 (0.3035)**	0.0371 (0.0177)**	0.0073 (0.0033)**	0.0518 (0.0775)			0.1579 (0.0507)***
South West							
South East							
North East							
North West							

Source: Authors' computation, 2024

