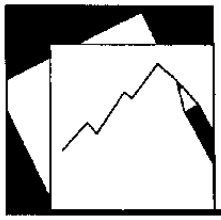
WP/02/114



IMF Working Paper

Poverty in a Wealthy Economy: The Case of Nigeria

Saji Thomas and Sudharshan Canagarajah

INTERNATIONAL MONETARY FUND

WP/02/114

IMF Working Paper

Research Department

Poverty in a Wealthy Economy: The Case of Nigeria

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Authorized for distribution by Peter Clark

July 2002

Abstract

This paper describes the nature and evolution of poverty in Nigeria between 1985 and 1992. It highlights the potential wealth of the Nigerian economy and examines how the economic policies pursued in the 1980s and 1990s impacted economic growth and welfare. The headcount measure of poverty in Nigeria declined from 43 percent to 34 percent between 1985 and 1992. Decomposing the factors causing the reduction in poverty shows that the overall decline of 9 percentage point was the net result of a 14 percentage point decline owing to the growth factor and a 5 percentage point increase owing to the income distribution factor. The paper proposes that promoting broad-based growth and targeted interventions in health, education, and infrastructure need to be central strategies in the fight against poverty in Nigeria.

JEL Classification Numbers: I32, O15, O40

Keywords: Economic growth, Poverty, Income distribution, Targeting, Nigeria

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I. Introduction

Nigeria's economy is characterized by a large, rural, agriculture-based traditional sector that encompasses about two-thirds of the population living in poverty, and by a smaller, urban, capital-intensive sector that has benefited from the exploitation of the country's resources and from the provision of services that successive governments have provided. As in many African economies, the rural, traditional, mostly private agricultural sector is characterized by small-scale, poor farmers and by informal traders. The formal, capital-intensive sector has a few multinational firms, a multitude of small local industries, and a myriad of government parastatals operating in most areas of economic activity. The formal, urban, capital-intensive sector jobs are better paying and more secure, but scarce. This duality arose in large measure from domestic policies that steered most investment—physical, human, and technological—into a few already capital-intensive sectors of the economy. The benefits of government and foreign investment have only reached a relatively narrow strata of the population, while the majority of the people have not benefited from higher productivity or increased real wages (World Bank, 1996a).

Nigeria's past pattern of development and the incentive regimes have tended to favor the urban, modern sector to the detriment of the traditional, rural sector, consistently worsening the domestic terms of trade of the latter. Moreover, economic and social policies, have clearly accentuated poverty in some regions more than others. The southern and middle agroclimatic zones are better provided with infrastructure and social services than the northern zone (Odafalo, 1981). More of the doctors, nurses, and hospitals are in the south and to a lesser extent the middle zone; the south also has more and better schools. Given the geography of Nigeria, the southern zone also has had a longer exposure to economic development and to modern international links. Nevertheless, poverty is pervasive—to differing degrees—in all three regions, and within all states (World Bank, 1995b).

This paper draws together the broad economic performance and poverty incidence in Nigeria and suggests possible ways of addressing deteriorating welfare levels of its citizens. Section 2 shows the wealth of the Nigerian economy, while Section 3 describes the significant economic developments in Nigeria during the past two decades. Section 4 provides a poverty profile for Nigeria using the 1985 and 1992 household surveys, and tracks the evolution of poverty indicators in the various segments of the population during economic reforms. Section 5 discusses strategies for effectively reducing poverty in Nigeria given the economic potential of the country. Finally, Section 6 provides some concluding remarks.

II. Wealth of the Nigerian Economy

Nigeria is endowed with land, oil, and natural resources, but a substantial portion of its population remains very poor because of its failure to manage its wealth effectively. Between 1970 and 1990, Nigeria earned almost US$200 billion (primarily through exports), some of which was locally invested. However, these investments had very little

impact on the population's welfare. Nigeria produces between 1.8 and 2.0 million barrels of oil per day. The average price of crude oil in the world market in the late 1980s was around US$20 per barrel. This income indicates the wealth of this economy. Oil alone accounts for about 90 percent of Nigeria's export income. Apart from oil, Nigeria also exports cocoa, rubber and other non-oil products. In 1995, the export income from oil was about US$10 billion (Tables 1 and 2).

Table 1. Nigeria: Selected Petroleum Statistics, 1989–95

Year	Production (in millions of barrels per day)	Export Values (in millions of current US dollars)
1989	1.72	9,642
1990	1.81	13,510
1991	1.89	11,655
1992	1.96	11,642
1993	2.04	9.697
1994	2.01	9,171
1995	1.99	11,449

Source: International Monetary Fund 1998.

Table 2. Nigeria: Composition of Exports, 1989–95
(value in millions of current US dollars)

Year	1989	1990	1991	1992	1993	1994	1995
Oil	9,642	13,510	11,655	11,642	9,697	9,171	11,449
Cocoa	142	150	176	81	76	83	77
Rubber	69	41	78	59	40	32	58
Other Non-oil	159	187	205	126	174	120	140

Source: International Monetary Fund 1998.

Among Sub-Saharan African countries, Nigeria had the second largest export income (after South Africa) in 1994. Nigeria earned about US$9 billion while South Africa earned about US$23 billion. On a per-capita basis, Nigeria had the fourth largest export income per capita, after South Africa, Angola and Zambia. (Table 3). This clearly shows the wealth of the Nigerian economy and its potential for effectively alleviating or reducing poverty.

Table 3. Total Exports of selected Sub-Saharan African Countries, 1994
(value in millions of current US dollars)

SSA countries	Exports	Export income per capita
Nigeria	9,171	113.2
Ghana	986	61.8
Kenya	1,339	53.5
Uganda	164	9.1
Zambia	1,100	122.2
Angola	3,833	383.3
South Africa	23,892	597.3

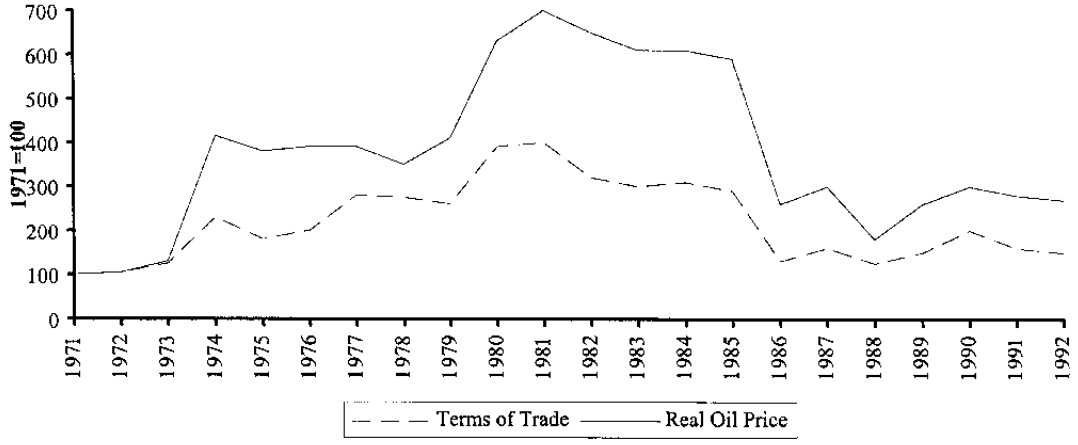
Source: World Bank, 1995a.

III. The Economic Evolution of Nigeria, 1971–95

A. Before the Structural Adjustment Program (SAP)

Many important events prior to 1985 affected the economy and poverty, none more significantly than the management of oil revenues. The positive oil shocks of 1973 and 1979 multiplied the terms of trade more than three times between 1973 and 1981 (see figure 1). The huge inflow of oil revenues were spent as if the exceptional oil price increases of the 1970s were permanent. This spending drove up real per capita income (in 1987 prices) from ₦ 1,300 in 1972 to nearly ₦ 2,900 in 1980 (in current US$ of the time, from US$280 to US$1,100—see Figure 2). After 1980, oil revenues collapsed and real per capita income dropped precipitously. However, movements in real per capita private consumption during the late 1980s were much less marked.

Figure 1. Terms of Trade and Real Oil Prices, 1971–92

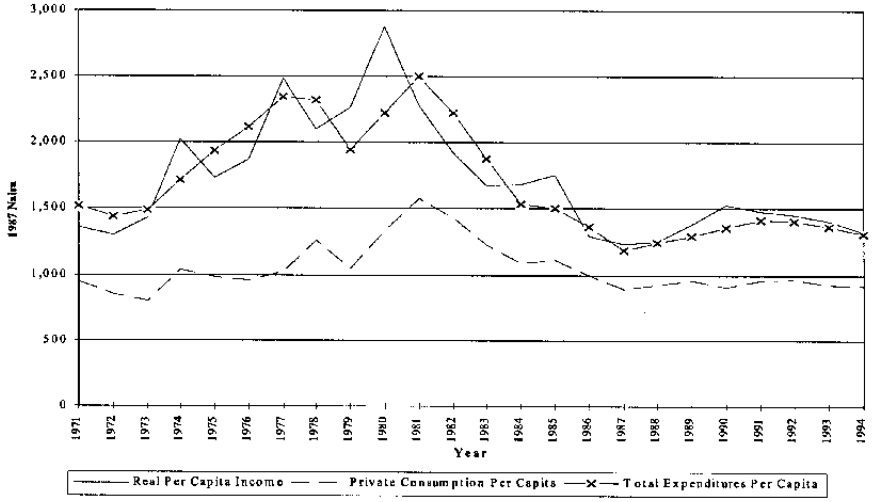


Source: International Monetary Fund 1998.

The agricultural sector, in which the bulk of the population earns a living, has experienced a volatile pattern of growth. During the oil boom period the Naira appreciated, and agricultural exports plummeted by nearly 50 percent in value and by more than 50 percent in volume. There was a partial recovery in the sector in 1984, after the 1983 drought, which was then followed by the harvest boom in 1985 (Collier 1988). During the late 1970s, non-agricultural wages fell dramatically when the labor supply increased sharply in non-agricultural activities following the steady migration to urban areas. Although agricultural wages stabilized in real terms following the decrease in the agricultural labor supply, in the early 1980s these wages also began to decline. As a result, the gap between non-agricultural and agricultural wages that had widened during the oil boom period, gradually eroded and by 1985 had disappeared. A study by Jamal and Weeks (1988) shows that the poor benefited little, or not at all, from the vast

expansion of oil revenues. The sharp decline in oil prices in 1982 resulted in a decline in economic activity. However, the real effective exchange rate continued to appreciate, the agriculture sector remained weak, and large-scale food imports continued. During the late 1970s and early 1980s employment growth slackened, real wages declined, and after 1980 private consumption per capita also declined.

Figure 2. Real Per Capita Income, Private Consumption and Expenditures, 1971–94



Source: International Monetary Fund, 1998.

B. The Adjustment Era

The SAP included a number of exchange rate and trade regime reforms. The fixed official exchange rate was replaced with a floating, market-determined exchange rate. As a result, the exchange rate moved from ₦ 1/$1 at the beginning of 1986 to ₦ 3.2/$1 by the end of the year.[2] This temporarily eliminated the gap between the parallel and official rates. Import and export licensing was abolished in 1986, and most prices within the economy were deregulated. The immediate effect of these reforms was to restore the incentive to export, reduce the incentive to import, and increase the profitability of agriculture. While oil prices remained low during 1986-92, it was associated with a real exchange rate depreciation and hence better performance of the non-oil sector, including the agriculture and domestic manufacturing sectors that had languished during the oil boom years. With a shift in relative prices in favor of the rural sector, production of traditional food crops and cash crops increased, and agricultural output grew at an annual rate of 3.5 percent in 1987-92, compared with only 0.6 percent between 1981 and 1986. Real GDP grew at an average of 4.8 percent per annum in the 1986-92 period, which amounts to 1.7 percent growth in per capita GDP. More important for poverty reduction,

[2] As of Jan 25, 2001 the official exchange rate is $1= ₦ 145.

real per capita private consumption, grew at 1.45 percent, which is in line with the per capita GDP growth (table 4).

Table 4. Nigeria: Nominal and Real GDP Growth, 1985–92

	1985	1986	1987	1988	1989	1990	1991	1992	Average
Nominal GDP at market prices (₦ billion)	72.4	73.1	108.9	145.2	224.8	260.8	324.0	549.8	244.3
Real GDP at market prices (₦ billion; 1990 prices)	200.8	205.9	204.5	224.7	240.9	260.6	273.0	280.9	236.4
Real growth rates (in percent)	10.6	-1.7	-3.8	9.4	8.2	7.5	5.9	2.6	4.8
Real per capita private consumption (in 1990 Naira)	2106	1937	1628	1801	1610	1614	1961	2114	1846

Source: International Monetary Fund 1998.

Agricultural output grew at an annual rate of 3.5 percent between 1987 and 1992. With a shift in relative prices in favor of the rural sector, production of traditional food crops and cash-crops increased. These favorable economic developments led to an expansion in the demand for labor in the non-oil, tradable sector, especially in agriculture, as the adjustment policies made domestic food and export crop production more attractive.

C. Post-adjustment Era

Events since 1992 have eroded many of the positive changes that took place earlier. With a reversal of many of the policies that contributed to growth and poverty reduction during the period 1986–92, Nigeria's economy has again fallen on hard times and poverty has increased. Real GDP increased by 2 percent between 1992 and 1995, and real per capita private consumption fell by 1 percent.

In 1995, the government introduced a new budget of "gradual deregulation" and began reversing some of the previous policies that had contributed to stagnation, high inflation, a reduction in income, and increases in poverty. These recent events strongly influence perceptions about poverty in Nigeria today, and obscure the improvements made between 1985 and 1992. According to recently conducted participatory poverty assessments, most Nigerians reported that they are worse off now than only two or three years ago (Todd 1995). But, it is important to recognize that this most recent decline in welfare was the result of the return from 1992–94 to the exchange rate, fiscal, monetary, and other economic policies that had such a destructive effect on the economy and society before 1986. Because, in real terms, both per capita income and per capita private consumption in 1994 were lower than in the early 1970s, prior to the oil boom, the long-term nature of poverty in Nigeria cannot have changed significantly.

IV. An Evolution of Expenditure and Poverty in Nigeria, 1985–92

This section presents a poverty profile of Nigeria for the years 1985 and 1992, and analyzes the *evolution* of poverty during the period marked by these two years. The

welfare analysis is based on a money metric approach rather than on social indicators. First we discuss the sources and quality of data used in this paper. Then we construct a *profile* of poverty in the years 1985 and 1992 by urban and rural areas, levels of education, age of household head, employment status, and regions. A poverty line is selected, which is equal to two-thirds of mean per capita household expenditure in 1985. The sensitivity of the analysis to other poverty lines is also analyzed. Attention is given to changes in income distribution and the relative impact of growth and redistribution.

A. Data Sources and Methodology

National Income Accounts: Data Sources and Methodology

The primary source of all historical national accounts is the data produced by the Federal Office of Statistics (FOS) in Nigeria, often with a lag of about one year. The FOS produces national accounts data both by sector of origin and by expenditure method at current as well as constant prices. In many sectors, gross output is converted to net output by applying fixed coefficients observed from the past (base) years, not by independent estimates of intermediate consumption (World Bank 1996b).[3] On the expenditure side of GDP, government consumption and investment data are obtained from the government budget estimates, and private consumption is derived residually.

The FOS also estimates price deflators for each sector of activity that are used to arrive at the sectoral value added at constant prices. In many cases, sectoral price deflators are not based on producer prices, but on consumer price sub-indices for a particular activity. The deflator for consumption is proxied by the Consumer Price Index (CPI). For exports and imports, unit price and exchange rate data are used to derive the deflators.[4] As in many African countries, the Nigerian dataset is not without its weaknesses. Overall, the estimation of sectoral GDP for all but the oil sector does not suffer from a methodological shortcoming. In the absence of actual data, the FOS has used fixed ratios of value added to gross output to derive value added for the oil sector. The 1985–94 gross output is estimated from the oil production and export price data. The adoption of this methodology results in a serious underestimation of oil, as well as total GDP, in Nigeria.

The expenditure accounts have several important shortcomings. First, the customs cleared import data used by the FOS grossly under records the actual imports. Second, the government consumption and investment data used by the FOS do not capture the expenditures incurred by all tiers of government, particularly the off-budget and special

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[3] Official exchange rate is used for the period 1981-94 and the weighted average of free market and official exchange rate is used for the period 1995-97. For 1995 and 1996 the FOS uses weighted average exchange rates to derive the Naira estimates, while in 1997 they have, for the first time, used the AFEM exchange rate for this purpose.

[4] The FOS data do not capture many non-oil exports as well as non-dutiable imports, particularly for the oil sector. In recent years, the Central Bank of Nigeria (CBN) estimates of imports of goods based on data on exchange transactions, are about 20–30 percent higher than the customs' estimates.

funds. Third, the private investment estimates of FOS also suffer from a gross underestimation problem as they neither fully capture oil sector investments nor other components of domestic investments.

National Consumer Surveys

The National Consumer Surveys, implemented by the FOS, are a nationwide household survey on various dimensions of the households' living standards. Data is collected at three levels: household, community, and individual. The sample frame is based on the 1980 population census. A two-stage stratified sample design is used in the 1985 and 1992 surveys. In the first stage, 1,224 Enumeration Areas (EAs) are selected with the probability proportional to the number of census households in the area. The stratification criteria are based on state of residence and the locality (urban/rural). In each state, 40 EAs from urban and 30 EAs from rural areas are selected. In the second stage, the sampled areas were randomly allocated to each month of the survey year, resulting in about 4 urban EAs and 3 rural EAs in each month. A total of 20 households were selected from each of the 7 EAs; next a systematic sample of 1:4 was chosen giving an ultimate sample of about 5–6 households. The expected sample was not achieved in the survey due to non-coverage of EAs and non-response at the household level. For instance, the average sample size in 1985 was 8,937 households, with 3,661 households from 40 EAs in urban areas and 5,276 households from 30 EAs in rural areas.

B. Estimation of Household Expenditure

Expenditures on nineteen major *food items* were considered in the household surveys from April 1985 to March 1986 for the 1985–86 survey, and April 1992 to March 1993 for the 1992–93 survey. [5] This was done by daily visits to each household over a one-month period. For home consumption, the estimate of annual home consumption was obtained by multiplying the estimated cost of the amount of each item consumed, based on the number of months in a year the item was consumed. The resulting figure summed up across all home-produced food items provided an unbiased estimate of home consumption at the household level. [6]

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[5] The two surveys do not have any major compatibility problem. The duration of the two surveys is the same from April to March. The only difference is in the aggregation procedure. The 1985 survey provides detailed information on all the items consumed by the households, while the 1992 survey only provides sub-aggregate level information on food and non-food items. The sampling frame still relates to the 1985, but to account for the 21 states we used 1992 state classification.

[6] These surveys are very narrowly focused on income and expenditure and do not provide any precise information or any detailed analysis of gender issues, economic activities, employment patterns etc. For example, there is very little information for gender analysis; no data on remittances; and coverage of barter or non-formal economic activities and own consumption are likely to be under-represented at the expense of the modern economy. These, among many other things, have an influence on poverty conclusions. However, they do provide a detailed picture of household expenditures for two time periods in a comparable form, which is not available from any other sources. The poverty analysis is based on

Eleven categories of major *non-food items* were also used. Imputed housing rent was calculated for those households with no information on rent or on owner-occupied dwellings. Household educational expenditures were also obtained by totaling all household members' educational expenses.

Definition of the Poverty Lines

Poverty lines are cut-off points separating the poor from the non-poor. They can be monetary (e.g. a certain level of consumption) or non-monetary (e.g. a certain level of literacy). The use of multiple lines can help in distinguishing different levels of poverty. There are two main ways of setting poverty lines—in a relative or absolute way:
(i) *Relative poverty lines*: These are defined in relation to the overall distribution of income or consumption in a country; for example, the poverty line could be set at 50 percent of the country's mean income or consumption.
(ii) *Absolute poverty lines*: These are anchored in some *absolute* standard of what households should be able to count on in order to meet their basic needs. For monetary measures, these absolute poverty lines are often based on estimates of the cost of basic food needs (i.e., the cost a nutritional basket considered minimal for the healthy survival of a typical family), to which a provision is added for non-food needs.

There is no *official* poverty line in Nigeria, so we used the mean per capita real household expenditure (hereafter, mean per capita expenditure) in 1985 and 1992 as the basis for the poverty analysis in this paper. Two separate relative poverty lines are used to distinguish the different degrees of poverty. The *upper poverty line* is defined as two-thirds of the mean value of consumption in 1985–86 Lagos prices. This corresponds to a poverty line of 395.41 Naira per person per year. The *lower poverty line* is one-third of the mean value of consumption in 1985–86 Lagos prices at 197.71 Naira. People who fell below the lower poverty line are referred to as *extreme poor*, while those who are above this line, but below the upper poverty line are referred to as *moderate poor*[7]. It is worth noting that the poverty line selected for this study (₦ 395), is slightly higher than the minimum wage of unskilled labor in 1985 (adjusted for per capita equivalence) of ₦ 325. It is also slightly higher than a poverty line of US$1/day per person (which, adjusted for purchasing power parity,[8] was ₦ 318) that has been used in many multi-country poverty comparisons.

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expenditure data, and we have made the most use of other household characteristics to supplement the analysis.

[7] The poverty line expenditure of ₦ 395 per person would provide a basket of commodities in 1985 which allowed households at the poverty line to consume food products containing 2,036 calories per person per day (slightly lower that the FAO consumption standard of 2,100 calories per person per day) and a minimum of non-food commodities as well. In 1992, the basket of commodities that could be purchased with the poverty line expenditures would provide foods with 2,219 calories per person per day, despite a rise in the relative price of food, but a lesser amount of non-food commodities

[8] Based on the purchasing power parity of the Naira in 1985–86, US$365 per capita per annum translated into ₦ 318 at that time.

Household expenditures were adjusted for regional price differences between the two periods using an alternative CPI, *weighted by the expenditure proportions of the bottom quintile*, with regional and monthly disaggregation.[9] The Foster-Greer-Thorbecke (FGT)[10] measures of poverty are used for the two periods to compare relative changes in poverty. These indices are disaggregated by regional, sectoral, state, and socio-economic groups.[11] The pattern of expenditure distribution, changes over time, and the implications of this for reducing poverty in Nigeria are also analyzed. Changes in the composition of expenditures by various disaggregations are also discussed.

The choice of a specific expenditure level such as the poverty line is, to some extent, arbitrary, but as figure 3 shows, the number of poor would obviously be higher if a higher poverty line were chosen. For example, if two-thirds of the 1992 mean per capita household expenditure—₦ 528 (in 1985 prices)—were used as the poverty line, the incidence of poverty (the headcount) would have been 58 percent in 1985 and 48 percent in 1992, instead of the 43 percent and 34 percent used here, but the decline in poverty incidence would be about the same.

C. Evolution of Per Capita Expenditures, 1985–92

On average, per capita expenditure rose by 34 percent between 1985 and 1992, but this growth has been uneven across the population. Although in national terms the average income level grew and poverty declined, all the middle income groups have had substantially lower growth in income levels than the national average (see Table 5). This resulted in smaller declines in poverty levels for these middle income groups. For the top 10 percent of the population, the increase was higher than the national average, which was 48 percent. For the bottom 20 percent there was a decline, and for the lowest 5 percent the decline was especially large. This below average growth in income, together with higher levels of food share for middle income groups in 1992, helps to explain why most middle-class households consider themselves to be worse off during this period.[12]

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[9] In line with convention, the expenditure pattern of the bottom quintile of 1985 was used to develop a "poverty re-weighted" CPI which is used to deflate the 1992 expenditures.

[10] The poverty measures used in this paper are drawn from *Foster, Greer, and Thorbecke* (FGT 1984). Please see Appendix 1 for a mathematical formulation.

[11] The Surveys were conducted in the 19 States which existed in 1985. Subsequently, the 1992 survey data (which covered the reconfigured 22 States) was mapped into the original 19 States—specifically Katsina was mapped into Kano, and Akwa Ibom into Cross River. As the Federal Capital Territory was carved from three states, it was treated as a separate entity in 1992, and does not exist in 1985.

[12] The results from the Participatory Poverty Assessment (PPA) (Todd 1995) also confirm this view.

Table 5. Nigeria: Distribution of Average Per Capita Expenditure, 1985 and 1992, by Population Deciles (in constant 1985 Naira per annum)

Decile	1985 average per capita expenditure	1992 average per capita expenditure	Overall Change (in %)
First Five Percent	118.10	70.24	-40.5
Second Five Percent	175.22	140.51	-19.8
Second Decile	229.47	210.94	-8.1
Third Decile	289.98	304.58	5.0
Fourth Decile	351.86	404.13	14.9
Fifth Decile	421.40	505.68	20.0
Sixth Decile	512.03	633.59	23.7
Seventh Decile	624.13	806.09	29.2
Eighth Decile	769.02	1,050.09	36.6
Ninth Decile	998.29	1,424.91	42.7
Tenth Decile	1,688.69	2,489.99	47.5
Mean Per capita expenditure	**592.81**	**792.6**	**33.7**
Moderate Poverty Line (2/3 mean per capita expenditure)	395.41	395.41	—
Extreme Poverty Line (1/3 mean per capita expenditure)	197.71	197.71	—
Moderate Poverty (%)	31.0	20.5	-10.5
Extreme Poverty (%)	12.0	13.6	+1.6
Non-Poverty (%)	57.0	65.1	+8.1
Gini Index	0.387	0.450	16.0

Source: Canagarajah *et al* 1997.

D. Estimating Poverty Measures

The poverty measure itself is a statistical function which translates the comparison of the indicator of well being and the poverty line which is made for each household into one aggregate number for the population as a whole or a population sub-group. Many alternative measures exist but the following three measures are most commonly used (see *Appendix 1*) for the formulae used to derive these poverty measures):

(i). **Incidence of poverty (headcount index, P0):** This measure gives the share of the population whose income or consumption is below the poverty line, that is, the share of the population that cannot afford to buy a basic basket of goods. An analyst using several poverty lines, say one for poverty and one for extreme poverty, can estimate the incidence of both poverty and extreme poverty. For non monetary indicators, similarly, the incidence of poverty measures the share of the population which does not reach the defined threshold (e.g. percentage of the population with less than 3 years of education)

(ii). **Depth of poverty (poverty gap, P1):** This measure provides information regarding how far off households are from the poverty line. This measure captures the mean aggregate income or consumption shortfall relative to the poverty line across the whole population. It is obtained by adding up all the shortfalls of the poor (considering the non-

poor has having a shortfall of zero) and dividing the total by the population. Put differently, it gives the total resources needed to bring all the poor to the level of the poverty line (divided by the number of individuals in the population). This measure can also be used for non-monetary indicators, provided that the measure of the distance is meaningful.

(iii). **Poverty severity (squared poverty gap, P2):** This measure takes into account, not only the distance separating the poor from the poverty line (the poverty gap), but also the inequality among the poor. That is, a higher weight is placed on those households who are further away from the poverty line. As for the poverty gap measure, limitations apply to some non-monetary indicators. All of these measures can be calculated on a household basis, i.e. by assessing the share of households who are below the poverty line in the case of the headcount index. However, it might be better to estimate the measures on a population basis – in terms of individuals – in order to take into account the number of individuals within each household. The measures of depth and severity of poverty are important complements of the incidence of poverty. It might be the case that some groups have a high poverty incidence but low poverty gap (when numerous members are just below the poverty line), while other groups have a low poverty incidence but a high poverty gap for those who are poor (when relatively few members are below the poverty line, but with extremely low levels of consumption or income). Tables 6a and 6b show the evolution of poverty using two different poverty lines. Table 6b shows the evolution of extreme poverty in Nigeria.

Table 6a. Poverty Incidence in Nigeria by Region, 1985–93
(Poverty Line = ₦ 395; headcount in percent)

	1985–86			**1992–93**		
Regions	**P0**	**P1**	**P2**	**P0**	**P1**	**P2**
Other Urban (Excluding Lagos)	32.0	7.0	3.8	30.6	10.1	4.8
Rural	49.5	18.9	9.5	36.4	12.2	6.6
Lagos Urban	24.0	7.0	3.2	27.9	16.1	9.5
All Nigeria	43.0	15.7	7.9	34.1	14.7	8.5

Source: Canagarajah *et al* 1997.

The cost of basic needs might vary between areas and over time. Expenditure and income data are proxies for the real level of welfare that households are reaching. Nominal expenditures or incomes need to be made comparable in spatial terms, by adjusting for

Table 6b. Incidence of Extreme Poverty in Nigeria by Region, 1985–93
(Poverty Line = ₦ 198; headcount in percent)

	1985–86			1992–93		
Regions	P0	P1	P2	P0	P1	P2
Other Urban (Excluding Lagos)	4.9	0.9	0.3	11.1	3.7	1.8
Rural	16.1	4.2	1.7	15.4	6.0	3.2
Lagos Urban	4.3	1.5	0.6	7.2	2.1	0.8
All Nigeria	12.0	4.1	1.6	13.6	8.5	3.4

Source: Canagarajah *et al* 1997.

different price levels in different parts of the country. The more diverse and vast a country, the more important spatial adjustments will be (factors of diversity include the degree of rural-urban integration, remoteness of areas, and so on). Adjustments are also sometimes needed over time, sometimes within a given survey. That is, if inflation is significant during data collection, whether a household is interviewed at the beginning or the end of the data collection period will matter. Then time adjustments will be needed. Once regional price indices are available, one can make the adjustments in two different ways: (1) apply spatial and time deflators to the income or consumption of each household and compare it against a single poverty line or (2) compute one poverty line for each region and date.

In this analysis the poverty line is held constant in real terms throughout the period. Incomes in 1992 were adjusted to 1985 prices, using the CPI between these two periods. The value of the poverty line expenditures thus adjusted shows the purchasing power of the poverty line incomes in 1985 and 1992, and the standard of living that each would provide.

E. Poverty Profile of Nigeria, 1985–92

The incidence of poverty (P0) declined from 43 percent in 1986-86 to 34.1 percent in 1992-93. However, the size of the poor population declined slightly from 35.8 million to 34.7 million.[13] This small decline in numbers (1.3 million) is in contrast to the large decline in headcount index (from 43 percent to 34 percent) reflected the high growth rate of the population (2.9 percent per annum). The overall decline in the size of the poor population masks the different trends for the urban and rural areas—*urban poverty increased while rural poverty declined.* The number of poor in rural areas fell sharply, from 26.3 million to 22.8 million, while the number of poor in urban areas rose from 9.6 million to 11.9 million (Table 7a). However, recent studies have estimated the headcount poverty index in 1995 to be 40 percent.[14] The incidence of extreme poverty also followed a similar trend. Nationally in rural and in urban areas, the monogamous male-headed and polygamous households account for more than 80 percent of all households in extreme poverty. In both rural and urban areas, all households in extreme poverty are larger than the national average—headed by individuals with little or no schooling, who are predominantly self-employed, and spend 80 percent of their income on food.

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[13] The population estimates for 1985 and 1992 are taken from the United Nations World Population Projections for Nigeria. (See also the discussion of population data in Canagarajah *et al, Evolution of Poverty and Welfare in Nigeria, 1985–92).*

[14] This is based on the household survey data for 1996. The 1996 dataset has some outstanding sampling issues which need to be resolved. However, the 1992-95 period has witnessed deterioration of the macroeconomy, with increasing fiscal deficits, high inflation, low GDP and export growth and pressure on the exchange rate, and one would assume that poverty has increased.

Table 7a. Poverty Comparisons: All Poor (Poverty Line = ₦ 395)

	1985-86			1992-93		
	National	Urban	Rural	National	Urban	Rural
Number of People (million)	35.8	9.6	26.1	34.7	11.9	22.8
Poverty Incidence (percent)	43.0	31.7	49.5	34.1	30.4	36.4
Poverty Depth (percent)	15.7	7.0	18.9	14.7	12.0	16.1
Poverty Severity (percent)	7.9	3.8	9.5	8.5	6.5	9.5

Source: Canagarajah *et al* 1997.

Table 7b. Poverty Comparisons: Extreme Poor (Poverty Line = ₦ 198)

	1985-86			1992-93		
	National	Urban	Rural	National	Urban	Rural
Number of People (million)	9.9	1.5	8.5	13.9	4.3	9.6
Poverty Incidence (percent)	12.0	4.8	16.1	13.6	10.9	15.4
Poverty Depth (percent)	4.1	0.9	4.2	8.5	6.1	8.0
Poverty Severity (percent)	1.6	0.3	1.7	3.4	2.2	2.9

Source: Canagarajah *et al* 1997.

F. Progress in Social Indicators

Since demographic factors are both the determinants and consequences of economic and social development, any analysis of poverty over time would be incomplete without examining the trends in socio-economic indicators over that period of time. In Table 8, we examine four key social indicators namely, life expectancy at birth, infant mortality rate, adult literacy rate and population with access to health care. All these social indicators show an improvement during the 1980-96 period, and tend to corroborate the reduction in poverty observed with money metric measures.

Table 8. Progress in Selected Social indicators, Nigeria

Indicators	1980	1996
Life expectancy at birth (years)	46	53
Infant mortality rate (per 1000 live births)	99	78
Under-five mortality rate (per 1000 live births)	196	130
Adult Male illiteracy rate (%)	58	30
Adult Female illiteracy rate (%)	69	48
Population with access to health care (%)	40	67

Source: World Bank, World Development indicators, 1998

G. Poverty Across States

Poverty in Nigeria on a state-by-state basis shows that it declined in almost all areas except the north (table 9). The improvement was particularly marked in the south except in Sokoto, Kano, Rivers, and Lagos urban areas. The largest increase was observed in Sokoto where poverty increased by almost 6 percentage points. There have also been large declines in *extreme* poverty in some states in all three regions.

Table 9. Poverty in Nigeria by State, 1985-92 (Poverty Line =₦ 395.41)
(in percent)

	1985–86			1992–93		
State	Incidence	Depth	Severity	Incidence	Depth	Severity
Lagos (urban)	24.0	7.0	3.2	27.9	0.9	0.3
FCT	0.0	0.0	0.0	49.5	24.5	15.7
Anambra	30.9	10.4	4.5	16.3	5.9	3.1
Bauchi	58.7	24.7	13.2	55.6	23.6	13.3
Bendel	41.7	14.6	6.7	16.2	6.1	3.3
Benue	46.0	18.3	9.3	36.8	17.6	11.4
Borno	42.1	16.8	8.7	41.8	18.5	10.8
Cross River	42.1	13.9	6.1	33.0	15.6	9.4
Gongola	48.8	19.1	9.8	31.7	12.9	6.8
Imo	32.2	10.1	4.5	14.4	6.6	4.0
Kaduna	49.8	18.0	8.7	24.7	9.7	5.3
Kano	48.3	16.4	7.6	50.8	19.9	10.4
Kwara	41.3	13.0	5.4	31.4	13.6	8.2
Lagos rural	36.1	11.6	5.2	36.1	14.5	7.6
Niger	56.6	28.5	18.2	44.4	20.0	12.2
Ogun	45.4	14.5	6.2	26.3	9.7	4.8
Ondo	44.5	17.9	9.3	26.6	11.2	6.6
Oyo	31.5	7.2	2.4	22.9	8.8	4.7
Plateau	47.5	17.2	8.7	42.6	18.8	11.3
Rivers	35.8	9.7	3.6	37.9	15.8	8.8
Sokoto	46.9	18.5	9.4	52.6	25.6	15.8
All Nigeria	**43.0**	**15.7**	**7.9**	**34.1**	**14.7**	**8.5**

Source: NCS 1985–86 and 1992–93.

The deterioration in the standard of living of the extreme poor, combined with an improvement in the standard of living of the moderately poor, was the result of an increase in income inequality *among* the poor: the Gini measure of income inequality among the poor in 1985 was 0.188 and increased to 0.251 in 1992. It was also the result of a decline in the average per capita expenditure of households that remained poor in 1992—from ₦ 254 in 1985 to ₦ 227 in 1992 (in 1985 prices). The rise in private per capita consumption from 1985 to 1992 was also accompanied by an increase in *national* income inequality—the Gini measure of income inequality rose from 0.387 to 0.450 (Table 5). This increase in inequality took place at the two extremes of household income distribution, reflecting growing polarities between the very poor and the very rich. There were only small changes in the relative shares of the seven deciles at the center of the distribution.

V. Growth, Inequality, and Poverty

In the extensive literature on the relationship between growth, income distribution and poverty, or between population shifts, intra-sectoral shifts and interaction between sectors and poverty, researchers have addressed many empirical questions which have been very relevant to policy makers and analysts. For example, how much of observed change in

poverty is due to changes in the *distribution* of income, as distinct from the *growth* in average incomes, or how much of the change in poverty is demographic - due to movements within regions or sectors. Standard inequality measures can be very misleading in this context. The first set of decompositions in the tables below offer tools for rigorously quantifying the contribution of distributional changes to poverty alleviation controlling for growth effects, and estimating the contribution of growth, controlling for distributional changes. The second set of decompositions allow for another rigorous quantification of the contribution of population shifts to poverty alleviation, controlling for intra-sectoral shifts and interactions within sectors and the contribution of intra-sectoral shifts to poverty alleviation controlling for population shifts and interaction between sectors. However, like any descriptive tool, these decompositions have their limitations. For example, the decomposition cannot explain if an alternative growth process with better distributional implications would have been more effective in reducing poverty or not. Changes in poverty rates can also be decomposed into changes due to economic growth (or mean income) in the absence of changes in inequality (or income distribution), and changes in inequality in the absence of growth.

The changes in poverty which occurred in Nigeria between 1985 and 1992 are the net result of two effects: a rise in the mean level of household expenditure per capita and a change in the distribution. It is useful to separate out the two effects, in order to properly assess the policies of the period and to see where future policy needs to be focused. Following Ravallion and Datt (1991), the change in P_α can be written as the sum of a growth component, a redistribution component, and a residual.

Let,

$$P_{\alpha,t} = P_\alpha(U_t/Z, p_t),$$

be the level of Poverty in time t, where Z is the poverty line, U_t is the mean per capita expenditure and p_t is the distribution of expenditure in year t. Following Ravallion and Datt (1991), for any two periods or dates 0 and 1, the *growth component* of a change in the poverty measure is defined as the change in poverty due to a change in the mean per capita expenditure from U_0 to U_1, with no change in income distribution.

The *redistribution measure* is defined as the change in poverty due to a change in income distribution, with no change in mean per capita expenditure. Mathematically, the decomposition can be written as follows:

$$P(U_1/Z,p_1)-P(U_0/Z,p_0) = [P(U_1/Z,p_0)-P(U_0/Z,p_0)] + [P(U_0/Z,p_1)-P(U_0/Z,p_0)] + Residual$$

Change in Poverty = Growth impact + Inequality impact + Residual

The growth impact captures the change in poverty level due to a change in the mean expenditure between 1985 and 1992, while maintaining the 1985 income distribution.

(Lorenz curve remains unchanged). The inequality impact captures the change in poverty that would have been observed if mean income had not changed. In other words it shows the effect of the changes in distribution between 1985 and 1992, while maintaining mean expenditure at the 1985 level. The last component is a residual and it reflects the interaction between changes in the mean and the distribution.

The change in P_α between 1985 and 1992 can then be written as

$$P_{\alpha,92} - P_{\alpha,85} = G(85,92;r) + D(85,92;r) + R(85,92r)$$

where r refers to the reference point, which in this case will be 1985.

Consider now, the second type of decomposition, the sectoral decomposition of a change in poverty. When analyzing the sources of observed reductions in aggregate poverty, one can make use of a simple decomposition formula proposed in Ravallion and Huppi (1989), and also exploiting the additive property of the FGT class of measures. The idea is to shed light on the on the relative importance of changes within sectors versus changes between them, such as due to inter-sectoral population or work-force shifts.

To see how this works, let P_{it} denote the FGT poverty measure (or any other additive measure) for sector i with population share n_i at date t, where there are k such sectors, and t=1, 2. Then change in poverty, can be decomposed as:

$$P_2 - P_1 = S(P_{i2} - P_{i1}) + S(n_{i2} - n_{i1})P_{i1} + S(P_{i2} - P_{i1})(n_{i2} - n_{i1})$$

Total change = Intra-sectoral + Population Shift + Interaction Effect

where all summation are over i=1,.....k. The "intra-sectoral effects" indicates the contribution of poverty changes within sectors, controlling for their base period population shares. The "population shift effects" show how much of the poverty in the first period was reduced by the various changes in population shares of sectors between then and the second date. The "interaction effect" is a covariance term accounting for the interaction of the intra and inter sectoral effects. Over the period, there is very little change in the population shares of the three sectors, thus the component for inter-sectoral population and the interaction term turn out to be very small.

The decline in poverty in Nigeria was primarily caused by growth in average household consumption, which more than offset the deterioration in income distribution. We followed the Datt and Ravallion (1991) methodology to decompose the change in poverty into growth, redistribution, and residual components. However, the residual was evenly allocated to the growth and redistribution components. Decomposing the factors causing the reduction in poverty shows that the overall decline of 8.9 percentage points was the net result of a -13.6 percentage point due to the growth factor and a +4.7 percentage point due to income distribution factor (Figure 3). The national 8.9 percent reduction in poverty could have been a 13.6 percent reduction had income distribution remained unchanged.

Figure 3. Decomposition of Change in Poverty into Growth and Redistribution Effects

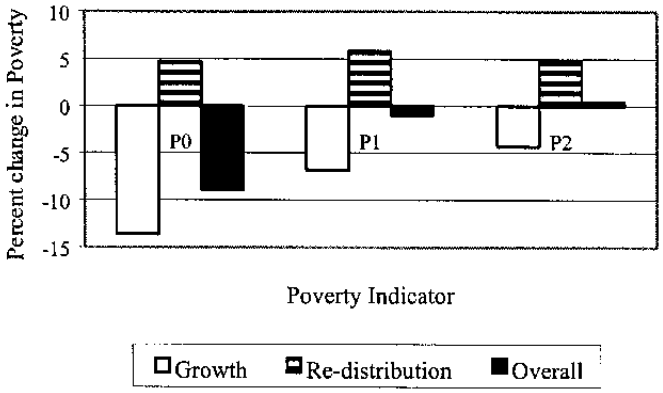


Figure 4. Decomposition of Change in Poverty into Growth and Redistribution Effects (Rural areas only)

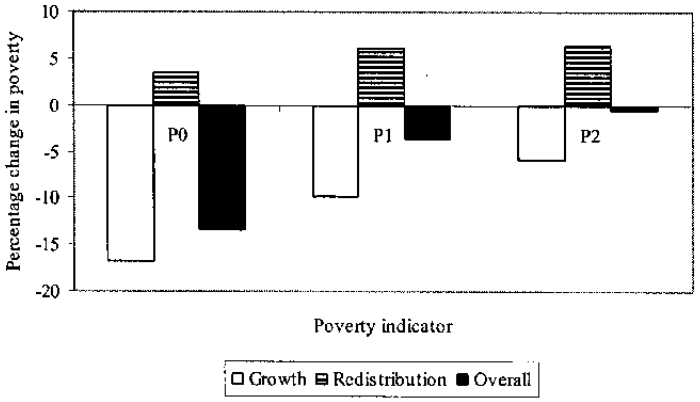
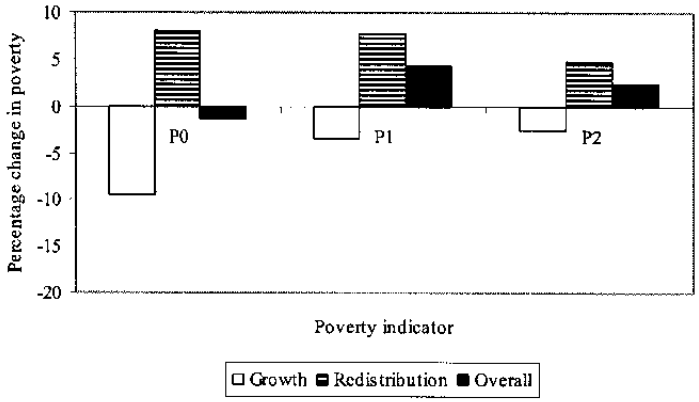


Figure 5: Decomposition of Change in Poverty into Growth and Redistribution Effects (Urban areas only)



Figures 4 and 5 show the relative importance of growth and re-distribution factors in reducing poverty. In the rural areas most of the reduction in poverty was brought about by economic growth (Figure 4), while in the urban areas poverty did not decline by as much, because most of the poverty reducing effect of the growth component was offset by the redistribution component (Figure 5).

While growth fueled the reduction of poverty, particularly in the large rural sector where 73 percent of the poor reside, income distribution worsened. The depth and severity of poverty are also concentrated in rural areas—8.4 million of the nation's 10 million extreme poor are in rural areas. Nigeria's experience of worsening income distribution with growth is shared by many, but not all, other countries. This clearly illustrates the importance of both the composition of growth, (in order that the poor share more in the process) and the distribution of income (in order that poverty can be reduced faster than the growth itself can achieve). This paper shows that growth alone is not sufficient to reduce poverty. Growth associated with progressive distributional changes will have a greater impact on poverty than growth which leaves distribution unchanged.

Also, the benefits of growth were not shared equally among different parts of the country. Increases in household expenditures were fastest in the southern and middle zones of the country—30 percent—but much slower in the northern zone—2 percent. The southern zone has most of the industry and many export crops, and the middle zone is the well-endowed "bread basket;" while the northern zone is largely rural and agricultural with a fragile agro-climatic environment and a different socio-economic history. The slower growth in the northern zone, and long-standing lags in the provision of health, education, and other social services have resulted in proportionately more poor being in that agroclimatic region during the period 1985–92.

A. International Comparison of Poverty

The incidence of poverty in Nigeria can be compared with other countries using a poverty line of US$1 per day per person converted to "purchasing power parity." Such a comparison indicates that income inequality in Nigeria is substantially greater than in Côte d'Ivoire and Ghana (Table 10).

Poverty incidence in Nigeria is not much higher than it is in Sri Lanka, but social indicators in Sri Lanka are more advanced. Gini coefficients show that income inequality in Nigeria, and more generally in Africa, are much greater, on average, than in Asia, but less than in Latin America. Worsening income distribution with economic growth, as in Nigeria, is evident in a number of countries in the world. A cross-country comparison of poverty decomposition indicates the relative importance of growth and redistribution in the decline in poverty (Table 13). In Côte d'Ivoire, in the 1980s, income distribution improved, but negative growth resulted in increasing poverty.

Table 10. International Poverty Incidence Comparisons (US$1/day poverty line)**

Countries	Incidence	Depth	Severity	Gini
Nigeria, 1992*	27.10	10.80	5.70	.450
Ghana, 1991–92	42.00	12.20	5.10	.408
Côte d'Ivoire, 1988	55.80	20.10	9.60	.346
Sri Lanka, 1990–91	23.50	5.00	1.60	.302
China, 1992	10.80	2.50	1.00	.321
Pakistan, 1991	22.30	5.40	2.00	.312
Panama, 1989	19.60	9.20	5.90	.568
Brazil, 1989	26.00	10.90	5.60	.638
Peru, 1990	40.60	14.10	6.70	.439
Colombia, 1991	3.00	0.80	0.30	.513

Source: Demery *et al*, 1995.

*For comparative purposes, these calculations are based on a poverty line of ₦ 318 reflecting US$1 per day in purchasing power parity for Nigeria, rather than the ₦ 395 used throughout this paper.

**See Canagarajah *et al*, 1997 for definition and interpretation of incidence, depth and severity.

In Nigeria, all of the decline in poverty was due to growth. In most of the countries (except Ghana), where poverty declined due to positive growth, inequality also improved (Table 11). In only two countries in Asia was the decline in poverty due to both improved income distribution and growth—Sri Lanka and Pakistan. In Latin America, Colombia also shows a positive contribution to poverty reduction through redistribution. But, in a number of countries, poverty reduction seems to have been achieved more often at the expense of worsening income distribution. The Nigerian experience is different, since inequality worsened especially in the urban areas. Hence policies that improve the distribution of income and assets, and measures that improve the poor's access to social services, should form essential elements of Nigeria's poverty reduction strategy.

Table 11. International Decomposition of Poverty: Percentage Changes in the Headcount Index

Countries	Growth	Redistribution	Residual	Total
Nigeria, 1985–92	-13.6	+4.70	—	-8.90
Ghana, 1989–92	-2.91	+2.18	-0.32	-1.05
Kenya, 1981–92	10.02	+1.99	1.85	13.87
Côte d'Ivoire, 1985–88	5.89	-3.06	-2.42	0.41
Sri Lanka, 1985–91	-4.98	-3.34	-0.44	-8.76
China, 1985–90	-1.12	+4.96	0.08	3.92
Pakistan, 1984–91	-0.96	-7.83	0.15	-8.64
Panama, 1979–89	0.59	+9.08	-0.08	9.59
Brazil, 1979–89	0.66	+4.77	-0.02	5.41
Peru, 1985–90	38.41	-3.00	-1.97	33.44
Colombia, 1980–89	-0.42	-1.00	0.05	-1.30

Source: Demery et al, 1995.

VI. Targeting the Poor

Although growth is necessary for poverty reduction, as shown in section 4, there are segments of the Nigerian population that have failed to benefit from the growth and

corresponding improvements in welfare between 1985 and 1992. This is not uncommon in developing countries and has led governments to pursue policies and programs that "target" the extreme poor who are left out from the benefits of growth, while vigorously pursuing growth-enhancing policies.

This is all the more necessary given the picture of poverty in Nigeria and how growth has reduced poverty only in certain sub-sections of the population. Therefore, it is vital that future poverty reduction strategies seek to include all segments of the population to effectively reduce poverty in all strata of the population. The government needs to seriously commit itself to such an encompassing strategy if poverty is to be completely eliminated in Nigeria. As the Poverty Alleviation Program Development Committee of the National Planning Commission in Nigeria stated: "a poverty program should contain a large number of relatively small, well-targeted, demand-driven projects and sub-projects that can be implemented by the communities themselves" (Nigeria,1995).

There are several ways that the poor can be targeted—namely, by economic activity, by region, by state, by Local Government Area (LGA), by community, by employment status, by gender, etc. From various aspects of the inter-temporal poverty profile presented thus far, one can draw out the implications for targeting, by using two targeting indices. The indices relate to how much impact on aggregate (national) poverty can be expected from a given transfer across different groups defined by a particular household indicator or characteristic. This paper focuses on two benchmark criteria. These correspond to the *additive* (or uniform) and *multiplicative* or (proportional) transfers. Additive transfers are generally defined as those transfers where the amount transferred is the same for all persons within the group. These transfers are progressive if it translates into increased or higher proportion of expenditure for the relatively poor. In the second case of multiplicative transfers, the amount received is proportional to the recipient's income or expenditure, these are distributionally neutral transfers. As shown in Kanbur (1987) and Datt and Ravallion (1990), it turns out that, to minimize P_α transfers, groups should be targeted in the order of the observed values of:

$P_{\alpha\text{-}1j}$, for additive transfers and,

$(P_{\alpha\text{-}1j} - P_{\alpha j})/U_j$ for multiplicative transfers.

where U_j is the mean per capita expenditure for group j. The poverty estimates in this paper already provide the needed information on the targeting index for additive transfers. In an earlier discussion on the FGT class of indicators, we saw that the squared poverty gap index, with $\alpha=2$ (P_2), assumes that the policy objective is to accord a greater weight to reducing poverty for those who are relatively poorer.

Our focus will be on P_2. Thus, for additive transfers, the relative targeting index is simply given as the poverty gap for group j, as a percentage of the national poverty gap. Groups with relatively high values of both indicators may be considered good choices for targeting or for design of policies favoring them. As shown in table 14, the higher the

index, the more efficient a transfer will be in reducing inequality. The table shows that the rural sector should be the most favored choice for targeting. Geographically, the northern zone is a good choice as more than one-half of the extreme poverty households nationally are located there. Based on the 1992–93 data at the state level, the following states also prove to be good candidates for targeting: Bauchi, Benue, Borno, Kano, Niger, Plateau, Rivers, Sokoto and FCT.

Table 12. Targeting Indices by Various Indicators 1992–93
(Poverty Line=₦395.41)

Groups and Indicators	Targeting indicators for Additive transfers
Nigeria	**100**
Rural	83
Urban	69
Lagos Urban	110
Ecological Belts	
Northern Rural	122
Northern Urban	135
Middle Rural	104
Middle Urban	122
Southern Rural	63
Southern Urban	69
State of Residence	
Anambra	40
Bauchi	161
Bendel	41
Benue	120
Borno	126
Cross River	106
Gongola	88
Imo	45
Kaduna	66
Kano	135
Kwara	93
Lagos	99
Niger	136
Ogun	66
Ondo	76
Oyo	60
Plateau	128
Rivers	107
Sokoto	174
FCT	167

Source: NCS, 1992–93

VII. Concluding Remarks

This paper sought to demonstrate the complex dimensions of poverty in Nigeria and the potential means at its disposal to address poverty. Nigeria, with its vast physical and human resources, is much better placed than many other African nations to address this problem. However, due to various policy distortions which have characterized its economic history, Nigeria has been crippled in its efforts to effectively address poverty. Nigeria's oil wealth has not been wisely invested to provide a sustainable stream of benefits to the poor. Sharp decline in education and health services, coupled with drastic reduction in capital and recurrent expenditures have resulted in a decline in the quality of services. This has had a negative impact on human development and welfare. It has been argued that in order to significantly reduce poverty in Nigeria, an annual per capita growth of 5 percent would be required (see World Bank 1996a). To achieve this target Nigeria has to implement a three-pronged *poverty reduction strategy.*

First, Nigeria needs to pursue rapid and sustained long-term growth through a combination of policies that support macro-economic stability, removal of price distortions, a more open trade regime, more efficient investments, and improved private sector access to resources, services, and markets, all of which will ensure broad-based growth in both the oil and non-oil sectors. *Macroeconomic stability* is the cornerstone of any successful effort to increase economic growth, and economic growth is an important factor in reducing poverty.

Second, the impact of growth on poverty will depend on the *distributional* patterns and *sectoral composition* of growth. Nigeria's long-term growth will also critically depend on increasing the poor's access to quality social services, particularly health and education. It is also essential that they have access to water supplies, sanitation, rural roads, and urban transport. Given the limitations of government resources and coverage, the government needs to involve the private sector, NGOs, and community-based organizations in social service delivery. This may also call for re-orienting public expenditures in order to address effectively poverty reduction and delivery of social services. These measures will enhance the *quality of growth*, that is, the degree to which the poor share in the fruits of such growth, through policies aimed at improving income distribution. These policies (e.g. pro-poor social spending) may be needed to ensure that the poor benefit from growth. In Nigeria twice as many poor live in rural areas compared to the urban areas, so growth in agricultural and tertiary sectors may have a major impact in reducing poverty because it can generate income for poor farmers and increase the demand for goods and services that can be easily produced by the poor.

Finally, the above strategies should be complemented with *targeting*, by transferring resources to the poor – especially those in the bottom quintile and communities located in the North region who have traditionally been marginalized with respect to development progress. This could be done by establishing effective *social safety nets* (which includes such measures as targeted public works, limited food subsidies), as an enduring part of the country's poverty reduction strategy.

Measurement of Poverty

This note provides mathematical expressions for the most commonly used poverty measures and for their decomposition by sector or, more generally, by group. The note focuses on the first ***three*** poverty measures of the so-called FGT class (Foster, Greer, and Thorbecke 1984), namely the **headcount**, the **poverty gap**, and the **severity of poverty**. The three measure are all based on a single formula, but each index puts different weights on the degree to which a household or individual falls below the poverty line. To see how the measures are defined, let consumption or household expenditures be arranged in ascending order, from the poorest Y_1, the next poorest Y_2..... with the least poor Y_q. The poverty gap index is defined as follows:

$$P_\alpha = \frac{1}{N}\sum_{i=1}^{q}\left(\frac{Z - Y_i}{z}\right)^\alpha$$

where Z = the poverty line; q = the number of individuals below the poverty line; N = the total number of individuals in the reference population; Y_i = the expenditure of the household in which individual i lives; α = the Forster-Greer-Thorbecke (FGT) index and takes on the values 0, 1, 2. The quantity in parentheses is the proportionate shortfall of income below the poverty line. This quantity is raised to a power a. By increasing the value of α, the "aversion" to poverty as measured by the index is also increased (See Boateng *et al*, 1992).

(i) Suppose α =0, so that the index measures no aversion to poverty, then

$$P_0 = \frac{1}{n}q = \frac{q}{n}$$

Poverty Headcount (P0) : This is the share of the population which is poor, i.e. the proportion of the population for whom consumption or income Y is less than the poverty line Z. Suppose we have a population of size n in which q people are poor. For example if there are 10 poor people out of 100, the ratio H = 10/100 or 0.1.

(ii) Suppose now that α =1, so that the "aversion to poverty" is increased, then

$$P_1 = \frac{1}{N}\sum_{i=1}^{q}\left(\frac{Z - Y_i}{z}\right)^1$$

This multiplies the "head-count ratio" or the proportion of the population below the poverty line, i.e. H, by the income or expenditure gap between the average poor person and the poverty line. To continue the example, if each of the 10 people above had an

income of 40 percent of the poverty line, then the *P2* measure would be 10/100 * 0.4 which equals 0.04. To better understand this, suppose q people are poor, i.e,.

$P_1 = q/n * (Z-Y)/Z = HI$, where $H = q/n$ and $I = (Z-Y)/Z$.

Poverty Gap (P1): The poverty gap, which is often considered as representing the depth of poverty, is the mean distance separating the population from the poverty line, with the non-poor being given a distance of zero. The poverty gap is a measure of the poverty deficit of the entire population, where the notion of ifpoverty deficitly captures the resources that would be needed to lift all the poor out of poverty through perfectly targeted cash transfers. It is defined as in Eq 2., where *yi* is the income of individual *i*, and the sum is taken only on those individuals who are poor (in practice, we often work with household rather than individual income, but individual income can still be defined as being equal, say, to the per capita income of the household). The poverty gap can be written as being equal to the product of the income gap ratio and the headcount index of poverty, where the income gap ratio is itself defined as: *PG=I*H, with*

It must be emphasized that the income gap ratio *I* in itself is not a good measure of poverty. Assume that some households or individuals who are poor but close to the poverty line are improving their standards of living over time, and thereby become non-poor. The Income gap ratio will increase because the mean distance separating the poor from the poverty line will increase (this happens because some of those who were less poor have emerged from poverty Œ so that those still in poverty are on average further away from the poverty line), suggesting a.deterioration in welfare, while nobody is worst off and some people are actually better off. Although the income gap ratio *I* will increase, the poverty gap itself *PG* will decrease, because the headcount index of poverty will decrease, suggesting an improvement towards poverty reduction. The problem with the income gap ratio is that it is defined only on the population that is poor, while the poverty gap is defined over the population as a whole. As mentioned above, the poverty gap is a useful statistics to assess how much resources would be needed to eradicate poverty through cash transfers *perfectly targeted* to the poor. Assume for example that the poverty gap is equal to 0.20. This means that the cash transfer needed to lift the poor out of poverty each poor person represents 20 percent of the poverty line. If the mean income in the country is equal to twice the poverty line, the cash transfer would represent 10 percent of the country's mean income. Now, if it is the mean income of the non-poor which is equal to twice the poverty line, and if half the population is poor, it can be shown that the tax rate that would have to be imposed on the non-poor to lift the poor out of poverty with perfectly targeted transfers would be 20 percent again. If the mean income of the non-poor is equal to four times the poverty line, under the same assumption the necessary tax rate would be 10 percent. Such simple simulations can be used to communicate in an intuitive manner the meaning of the poverty gap. In practice however, given that perfectly targeted cash transfers to eradicate poverty are neither feasible nor necessarily a good thing (high tax rates could stifle economic growth and thereby future poverty reduction), one must be careful in their use.

(iii) Suppose now that $\alpha = 2$. This weights the poverty of the poorest individual more heavily than those just slightly below the poverty line. This is done by squaring the gap between their incomes and the poverty line in order to increase its weight in the overall poverty measure.

$$P_\alpha = \frac{1}{N}\sum_{i=1}^{q}\left(\frac{Z - Y_i}{z}\right)^2$$

Severity of Poverty (P2): This is measured as the square of Poverty Gap (P1). While the poverty gap takes into account the distance separating the poor from the poverty line, the squared poverty gap takes the square of that distance into account. When using the squared poverty gap, the poverty gap is weighted by itself, so as to give more weight to the very poor. Said differently, the squared poverty gap takes into account the inequality among the poor.

The headcount, the poverty gap, and the squared poverty gap are the first three measures of the Foster-Greer-Thorbecke class of poverty measures. The general formula for this class of poverty measures depends on a parameter á which takes a value of zero for the headcount, one for the poverty gap, and two for the squared poverty gap in the following expression. It is important to use the poverty gap or the squared poverty gap in addition to the headcount for evaluation purposes, since these measure different aspects of income poverty. Indeed, the basing evaluation on the headcount ratio would consider as more effective policies which lift the richest of the poor (those close to the line) out of poverty. On the basis of the poverty gap *PG* and the squared poverty gap *P2,* on the other hand, puts the emphasis on helping those who are further away from the line, the poorest of the poor.

The P_a measure has the further advantage of being decomposable. For example, the national level measure of poverty can be expressed as the sum of regional measures weighted by the population share of each region:

$$P_\alpha = \Sigma\, k_j P_{\alpha_j}$$

where $j=1.....m$ regions, and k_j= population share of region j.

This in turn enables us to calculate the contribution c_j of each region to national poverty.

$$c_j = \frac{k_j P_{\alpha_j}}{P_\alpha}$$

This measure has direct relevance for policy. This enables us to understand the impact of various policy measures in different groups and regions of the country. Also the knowledge about the share of each region or group in total poverty is essential for targeted interventions.

Stochastic Dominance Test of Poverty

When comparing poverty measures over time or between groups, it is important to test the robustness of the observed changes in poverty indices. Indeed, the observed changes might depend on the selected poverty line and at the extreme, using two different poverty lines can suggest changes in opposite directions. Comparing poverty measures using stochastic dominance techniques can help in establishing the robustness of ordinal poverty rankings.

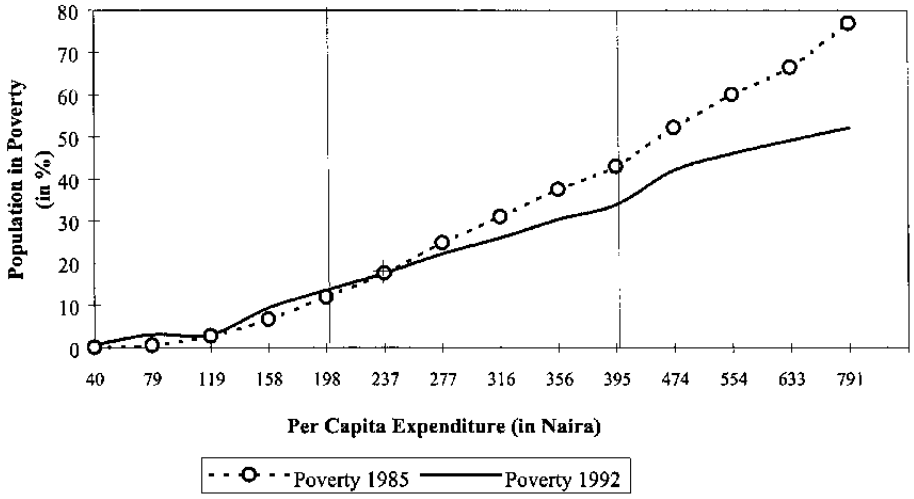
First-order statistical dominance involves comparing the cumulative distribution functions for the indicator of well-being (income or consumption) for each of the survey years, or for the various groups of households for which poverty comparisons are made. One distribution, dominates another if the income distribution function for that year or that household group lies above that of the year or other group at all levels of income or consumption. If one finds that first-order dominance holds between two different years, or between two different groups, this implies that all FGT poverty measures Œ including the headcount, the poverty gap, and the squared poverty gap Š in the first year or group are higher than in the other year or group for all poverty lines.

The starting point for the analysis of the changes in poverty in Nigeria from 1985 to 1992 is shown in figure 3, and shows the headcount measure of poverty in these two years at different levels of the poverty line. This extreme poverty line (₦ 198) is slightly below the level at which the two curves in figure 3 intersect (at ₦ 237). At a poverty line equal to or less than ₦ 237 per person, the headcount measure of poverty in 1992 is *greater* than that in 1985, but at all higher poverty lines it is lower. In other words, the bottom 17 percent to 18 percent of the income distribution had a lower standard of living in 1992 compared with 1985 by *any* measure. However, all other income groups had a higher standard of living in 1992. Apart from the broad changes in poverty due to changes in the poverty line, it is useful to conduct a more detailed analysis of changes in poverty using dominance tests. This involves plotting the entire distribution of expenditures by cumulative proportion of population (or decile) in terms of regions, geographical locations, and socio-economic groups (Ravallion 1992).

The *first order dominance* test, involves plotting the cumulative percent of people at successive levels of per capita expenditures. If we plot this for a country in two different periods, and if period two is always below the initial period, it implies that poverty has declined over time and any change in the poverty line will not affect this result. However, if these lines were to intersect, then the welfare implications of this intersection will depend upon where the poverty line is set and also vary according to different classifications. The first order dominance test for Nigeria using 1985 and 1993 data (shown in figure 5) indicates that poverty decline conclusions cannot be generalized as the curves intersect at the bottom end of the income distribution (that is, at ₦ 237, which is slightly higher than the extreme poverty line of ₦ = 198). Also, the cumulative distribution of the curve for rural areas does not show the decline in poverty for 1992 before the 30th percentile of the poverty line. As argued earlier, the bottom 18 percent of

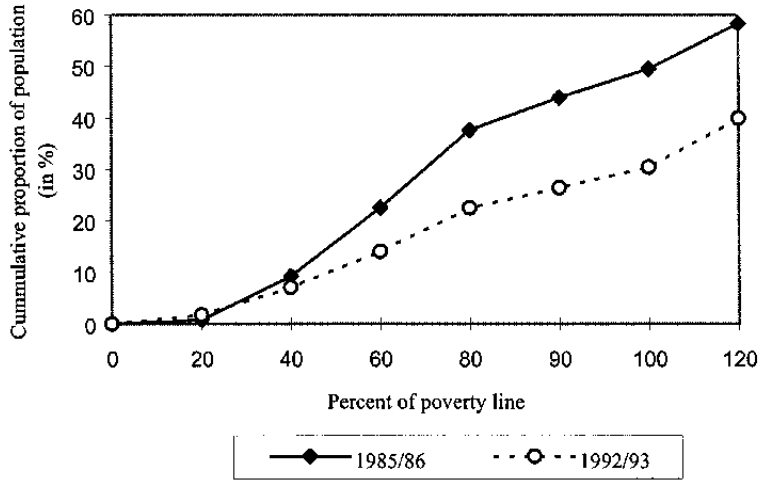
the national population were worse off between 1985 and 1992 despite an overall poverty decline and growth in per capita expenditure.

Figure A1. The Headcount Measure of Poverty at Different Levels of the Poverty Line, 1985 and 1992



Source : National Consumer Surveys, 1985 and 1992.

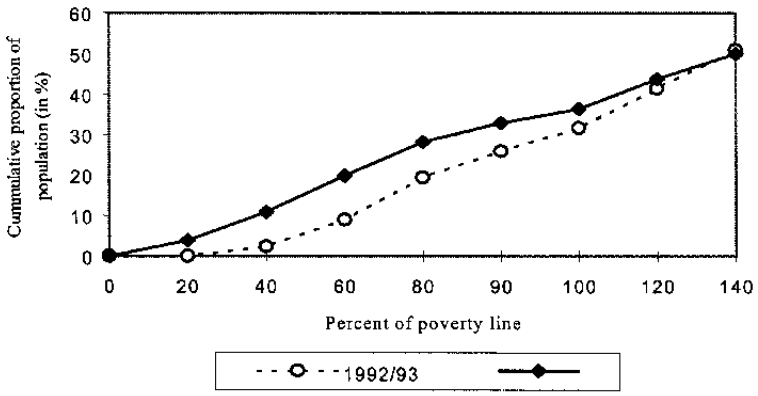
Figure A2. Rural Poverty Incidence Curves in 1985–86 and 1992–93



Second-order dominance tests involve analyzing 'deficit' curves, or integrals of the cumulative income distribution functions, and similarly determine whether poverty has improved or worsened over time for all poverty measures of the order of the poverty gap or higher, such as the squared poverty gap. Still higher levels of dominance can be established, and multivariate stochastic dominance can be used in the context of multidimensional distributions of poverty.

It is also possible to carry out higher order dominance tests using *poverty deficit curves* which plot the area under the cumulative distribution at each expenditure level. In all of these classifications we find that poverty declined between 1985 and 1992.[15] The figure below shows the cumulative distribution functions of national, urban, and rural Nigeria. It can be seen from figures 4 and 5, that incomes of rural population grew much more rapidly (by 47 percent) than those in the urban areas (by 16 percent).

Figure A3. Urban Poverty Incidence Curves in 1985–86 and 1992–93



[15] For discussion on dominance analysis for poverty deficit and severity curves, see Canagarajah *et al* 1997.

Characteristics of the Poor

The data from the household surveys show that poor households differ from non-poor households in several ways (table 10). Non-poor households' total expenditures are four to five times as much as poor households. While the poor spend proportionately more of their expenditures on food, the non-poor spend 3.6 to 4.5 times as much for food. The incidence of poverty is higher in larger households. Poor households have, on average, three children, while non-poor households have fewer than two. There are more employed people in rural than urban households. Table 11 shows the incidence of poverty in 1985 and 1992 by the different characteristics of heads of households and the regional location of the population. Rural households are significantly poorer than urban households. In addition to rural and urban residence, geographical location is also a factor in determining the incidence of poverty. The incidence of poverty in both 1985 and 1992 was higher in the northern agroclimatic zone and lowest in the south. Education is a critical variable: in 1985 the incidence of poverty was 48 percent in households in which the head had no education, and only 28 percent when the household head had secondary education. By 1992, poverty incidence had declined in both types of households to 39 and 23 percent, respectively. Among the extreme poor, lack of education is an overwhelming characteristic. Approximately three-fourths of those in extreme poverty had no education. Only a small fraction of those with a secondary education were among the extreme poor. Those without any education account for most of the poor, and an overwhelmingly large fraction of the extreme poor.

Table A1. Characteristics of the Average Poor and Non-poor Households, 1992

	Urban		Rural	
	Poor	**Non-poor**	**Poor**	**Non-poor**
Per capita expenditure	238.81	1064.12	220.25	1100.02
Food expenditure	189.64	682.16	169.06	736.27
Number of individuals (in millions)	11.9	27.3	22.8	39.9
Household size	7.5	3.8	6.8	4.2
Household heads age	46.5	40.8	47.5	45.4
Number employed	1.9	1.9	2.6	2.6
Number of children	2.9	1.9	2.7	1.9

Source: Canagarajah *et al* 1997

The Participatory Poverty Assessment (PPA) indicates that poor children commonly and increasingly do not attend school (Todd 1995). They and their parents consider the quality of education (particularly in rural areas) to be extremely poor and the prospect of education increasing employment prospects to be minimal. As a result, children spend their time working and learning traditional skills that will enable them to secure a basic livelihood during adulthood. The bleak prospect is that poverty will be perpetuated and even expanded among the current generation of school-age children.

The source of employment is a strong indicator of poverty. If the head of the household was working, poverty fell substantially by 1992—from 52.5 to 35.1 percent for the self-employed; and from 46 to 28.4 percent for wage earners (table 11). The percentage of extreme poor among agricultural households declined from 18.0 percent to 16.4 percent, while for service worker families it increased from 4.0 percent to 10.7 percent. Those identified as professional or technical workers, clerical workers, and sales workers, show an increase in their contribution to national extreme poverty between 1985 and 1992, but the data is very limited.

Age is also a key factor. In households headed by the young—age 16–25 only 20 percent were poor in 1985. Such households were, in fact, slightly more likely to be poor in 1992. But, the incidence of poverty was lower in 1992 than in 1985 for most other households. The older the household head, the more likely was he or she to lack education and the household to be in poverty in both years. In households with heads older than 45, nearly one-half were in poverty in 1985, while 35–40 percent of such households were poor in 1992 (Canagarajah *et al* 1997). Analysis of the 1992 Household Survey identified four key aspects of poverty that could be examined by household type: location, status, welfare, and occupation. The results also highlight the poverty of all polygamous households, of single, male-headed households in urban areas, and the constraints on women's educational and employment opportunities as reflected in the type of household in which she lives.

According to the NCS data, 10 percent of households are headed by women. Of the male-headed households, 58 percent are monogamous, while 25 percent are polygamous. While 9 percent of all rural households are female-headed, they only account for 5.4 percent of all poor in rural areas; *de jure* female-headed households account for about 3.8 percent of the rural poor. Among male-headed households in rural areas, both the depth and severity of poverty is greatest in polygamous households affecting a large number of women; such households make up 27 percent of all rural households yet contribute 37 percent of the rural poor. The poverty status of households in urban areas follows a similar pattern—with one exception, the depth and severity of poverty in single, male-headed households exceeds that of all other households, being almost three to five times greater than in female-headed households.[16]

[16] Definition and a detailed description of the different types of household structures are given in (World Bank, 1996a; Table 2.9).

Table A2. Incidence of Poverty by Characteristics of Head of Household and Region, 1985–92 (percentage, by category)

	1985			1992		
	Total	Urban	Rural	Total	Urban	Rural
Education						
No Education	48.1	37.8	51.9	39.5	37.8	40.0
Primary	35.8	28.6	47.5	28.5	28.2	28.9
Secondary	28.3	21.1	28.8	22.9	21.4	25.7
Post Secondary	23.5	23.8	16.2	22.8	23.5	21.5
Employment Status						
Wage Earner	46.0	33.6	51.5	28.4	27.7	29.7
Self-employed	52.5	57.4	51.4	35.1	31.9	36.7
Other	38.7	35.9	45.3	36.5	23.1	43.1
Agroclimatic Zones[17]						
North	48.5	33.1	55.5	44.9	41.7	46.4
Middle	47.4	38.1	52.1	38.0	37.1	48.5
South	36.5	28.9	42.0	23.9	22.1	25.4
Regions						
North	48.3	34.2	54.9	42.9	40.3	44.2
Southeast	36.8	27.3	43.4	24.6	22.6	26.0
Southwest	37.9	32.4	41.9	25.1	23.0	27.1
Age Group of Head						
16-25	20.4	10.1	27.2	22.1	17.2	26.2
26-35	31.7	22.6	38.9	25.1	18.2	30.5
36-45	43.3	30.4	51.2	34.5	31.6	36.5
46-55	48.1	41.1	51.2	38.1	36.4	39.1
56-65	50.4	39.0	55.2	39.6	39.3	39.8
66+	51.8	40.6	57.0	35.3	34.4	35.8
Gender of Head						
Male-headed	43.8	32.6	50.5	35.6	31.7	37.9
Female headed	37.2	27.7	42.1	21.4	20.9	21.8

Source: Canagarajah *et al* 1997.

[17] Agroclimatic zones are classified as: *Northern zone*: Bauchi, Borno, Jigawa, Kaduna, Kano, Katsina, Kebbi, Sokoto, Yobe; *Middle zone*: Benue, FCT (Abuja), Gongola (Adamawa/Taraba), Kogi, Kwara, Niger, Plateau; *Southern zone*: Abia, Akwa, Ibom, Anambra, Bendel, Cross River, Edo Delta, Enugu, Imo, Lagos, Ogun, Ondo, Osun, Rivers and Oyo.

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