

**REPORT ON MAPPING LIVELIHOODS AND NUTRITION IN NIGERIA
USING DATA FROM THE NATIONAL RURAL LIVELIHOODS SURVEY
AND THE NATIONAL FOOD CONSUMPTION AND NUTRITION SURVEY**

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Abstract

Poverty and malnutrition are persistent problems in Africa. Alleviation of these closely-related socio-economic problems must be guided by knowledge of their spatial distribution and relationships to biophysical and development factors. Two country-wide surveys, one on rural livelihoods, poverty and food demand, and the other on food consumption and child nutrition, were carried out in Nigeria by IITA, and the results mapped in order to assist interpretation. The lack of reliable recent census statistics in Nigeria complicates the process of mapping socio-economic variables. The Small Area Estimation technique has been adapted for regression of poverty and nutrition indicators against biophysical and socio-economic variables such as rainfall, soil fertility and travel time to markets and applied to groups of Nigerian States. Where no significant correlation was observed, values were interpolated geostatistically. Preliminary maps of poverty and nutrition are presented, and relationships of these indices to each other and to biophysical and socioeconomic factors is discussed.

Introduction

The FAO Status of Food Insecurity (SOFI) 2000 report (FAO, 2000) revealed a dramatic reduction in undernourishment levels in Nigeria, from 44% of the population in '79-'81, to 16% in '90-'92 down to 8% in '96-'98. This development was largely attributed to efforts such as IITA's breeding and multiplication programmes with specific reference to staple foods such as cassava. The success of these programmes can further be attributed to their affecting policy measures and government investment in distribution of planting material and post-harvest equipment. Nevertheless, due to the size of its population, 25% of all undernourished West-Africans still live in Nigeria.

Despite these reductions in undernourishment, Nigeria has been far less successful in combating its high level of malnutrition, although the Rome Declaration on Food Security (1996) states the need for "adequate access to safe and nutritious food". IFPRI (2001) warns that "unless more aggressive measures are taken, progress against child malnutrition is likely to slow down", yet malnutrition levels in Nigeria have not changed over the past decade. In fact, anthropomorphic studies reported in SOFI (1999) put Nigeria amongst the 10 countries with the highest incidence of underweight, stunted and wasted children under 5 years and show an under-five mortality rate of 191 per 1000 births (1995 figures).

Planning and effective implementation of targeted programs at national, state and even community levels are required to further reduce the current level of undernourishment among children and the population and to improve their nutritional status simultaneously. Unfortunately, little data exist on malnutrition levels of various age groups, particularly for children between 5-11 years of age. According to the National Population Census of 1991 (most current data) about 35% of the population are within this age group. Nutrition programmes targeted to this age group can have far reaching impact on the total population within the targeted period. A sustained programme will only be feasible if it is based on adequate information. For instance, a preliminary study by Kormawa *et al.* (2001)

showed that without knowledge of dietary requirements, urban poor in Nigeria are not likely to take advantage of the nutritional opportunities that the diverse markets in major cities offer.

Poverty is a root cause of undernourishment and malnutrition. In particular, previous studies have identified the following as key determinants of child malnutrition: *per capita* national incomes, women's education, variables related to health services, healthy environment and *per capita* national food availability (Smith and Haddad 2000). Cross-country studies, usually based on aggregated household level data, are used in arriving at these determining factors. Though these capture broad and regional trends they are mostly not appropriate for formulating sub-national level policies and programs. For Nigeria in particular, poverty indicators have steadily worsened since 1986 (FOS 1999). Agriculture and related jobs provide employment for almost 60% of the population, primarily for the rural population. Poverty and performance of the agricultural sector are closely related in Nigeria (D'Situa 1994). Targeting the rural poor is therefore pivotal to fulfil the objectives set by the World Food Summit 1996, to "reduce undernourishment to half the present level by 2015, to eradicate hunger and to achieve food security".

Regrettably, the Nigerian situation is comparable to several other Sub-Saharan countries, as food security and poverty reduction in the region is largely constrained by inappropriate policies and strategies that impact negatively on the rural sector. Consequently, the level of rural poverty is increasing at an alarming rate. In West Africa in particular, the majority of the poor live in the rural areas with more than 60% of them depending directly on agriculture for employment and subsistence, compared to 54% for Nigeria (CIA 2000). Over the past 15 years, *per capita* real agricultural GDP has declined sharply in almost all West African countries.

A major challenge for targeting the rural poor lies in the spatial complexity of the problem. Rural poverty is a function of, for example, restricted access to suitable land, labour or financial resources, market access for agricultural input/output. Each of these parameters has a spatial dimension which can be exploited for building our understanding of possible moderators for improving rural livelihoods at different aggregation levels. Unfortunately, Nigeria can be described as a data-scarce environment, which makes scaling-up or scaling out (following Harrington 1997) of household or village-level surveys difficult and not in all cases justified.

In order to contribute further to the reduction of world food insecurity, rapid implementation of local and national government policies that target the reduction of child malnutrition are required. However, these should be based on empirical data gathered from household, village, state and national level in order to link the spatial and temporal dimension of poverty with child malnutrition. At each of these levels, there are key drivers that need to be targeted for reducing poverty and malnutrition. Such data are presently not available in Nigeria, or where available, they are in formats that can not be used for effective policy and program planning.

Objectives

This research programme, partially reported in this paper, sets out to identify and parameterise key factors and socio-economic / policy drivers that affect poverty, malnutrition and undernourishment levels in Nigeria. Data collection for this research has taken place through household surveys nested within village, local government, regional and state aggregation levels. This information is supplemented by representative anthropometric studies and analysis of blood samples. The objectives of this study are outlined as follows:

- (1) Characterise the livelihoods and food security status of the rural poor on a household level. Parameters that are measured include the recommended core indicators for monitoring food security outcomes of FAO's committee on world food security, which are linked with poverty characteristics that are being collected. The datasets have been collected by an IITA core-funded study into rural livelihoods and food demand structures in Nigeria and by a food consumption and nutrition survey funded through USAID and FAO.
- (2) Collect and generate spatial information on key poverty-affecting parameters and processes. Georeferencing of villages, plus collection of additional data on infrastructure, was undertaken after the initial household surveys.
- (3) Analysis of datasets. Spatial attributes such as land cover, climate and distance to towns, markets and amenities have been incorporated in the statistical analyses of the datasets, and a series of variables indicative of poverty levels, development and nutrition have been mapped. The results of this part of the study are the main subject of this paper.
- (4) Through the combination of the (point-scale) household survey data and multi-disciplinary

spatial information sources, identify external constraints to adequate nutrition levels. These external "factors" that affect rural livelihoods and malnutrition include, amongst others, sources for balanced nutrition, access to input/output markets, land quality/natural resources and presence of agricultural extension/institutional development organisations (farmer groups, NGO's, agricultural extension, commercial advisors). This, the next phase of the study, will draw heavily on the correlations discovered during the mapping phase of the project.

The output of this research will be developed in close contact with the target audience through ongoing IITA projects such as the Rural Sector Enhancement Project (RUSEP), which links state and national government institutions and NGO's to shape a coherent agricultural development policy. The target audience has been identified as policy makers and other key players at national and sub-national levels. In this set-up, the results can play a practical role in ongoing policy-making at the national and state levels within the project timeframe and thus can make a contribution to reaching the 2015 deadline of the Rome Declaration before changes in social, economical and political conditions overtake the research findings and project design.

Data Collection

A) Rural Livelihoods, Poverty and Food Demand

Objectives

- To develop a novel poverty index and use the index to characterize rural poverty levels by livelihood category.
- To examine and quantify the relationship between poverty levels and rural livelihoods in Nigeria.
- To determine the food demand and consumption patterns by poverty and livelihood patterns.
- To determine optimal household production system that will take the farming households out of poverty
- To suggest policy relevant recommendations for reducing poverty and hunger at the household level

Table 1. Parameters Collected, Rural Livelihoods Survey

| Category | Parameters | |
|-------------------------------|---|-----------------------|
| Village Level | | |
| Education | Primary School | Secondary school |
| Health | Hospital / Clinic | Tap / Well Water |
| Other | Electricity | |
| Enterprise | Formal credit | Pesticide & Herbicide |
| | Fertilizer | Improved Seed |
| | Extension | Veterinary Doctor |
| Household Level | | |
| Composition, Description | Size of HH | Wealth possessions |
| | Age distribution | |
| Income | Enterprises | Farm revenues |
| | Remittances | Livestock revenues |
| | | Tree crop revenues |
| Expenditure: Food consumption | Per crop | |
| | Purchased / non-purchased | |
| Expenditure: Non-food | Staple / non-staple | |
| | <i>e.g.</i> fuel, soap, tobacco etc., clothing, equipment, maintenance, taxes | |
| Expenditure: Farm | Seeds | Equipment |
| | Inputs | Maintenance |
| Individual Level | | |
| For HH head + spouses | Years in education | |

Sampling method

A multi-stage stratified random sampling procedure was used in selecting the sample for this study.

State and ADP Selection

First, the country was divided into three zones, northern, middle and southern Nigeria. In each of the zones, 3 states were randomly selected. Each state is divided up into Agricultural Development Project (ADP) zones, typically 3-5 per state. Each of these zones was sampled proportional to the number of Local Government Areas (LGA) within a zone.

Local Government Area Selection

The number of LGAs selected from each ADP zone was proportional to the size of the zone. The proportionality factor is stated as follows:

$$S_z = \frac{n}{N} * 10 \tag{1}$$

where

- S_z = the number of LGAs sampled from a zone
- n = the number of LGAs in a zone
- N = the number of LGAs in all the zones in the state selected.

10 is the desired number of LGAs from each state selected for the survey, except for Abuja State where all the LGAs (6) were sampled.

Village Selection

The third stage involved using a list of villages for each of the selected LGAs, provided by the state ADP, to make a random selection of 10 villages.

Household Selection

An IITA research team joined the enumerators with the assistance of their supervisors and carried out the following steps:

- (i) House listing in the selected village by using chalk to number the houses.
- (ii) Household listing in each of the listed houses with the addresses of each household to facilitate recall.
- (iii) Random selection of households from the list of households.

The sampling strategy focussed on covering a large number of villages and, as a consequence, a reduced number of respondents per village. While this would reduce the representativity of the households for each village, the increased spatial distribution would improve the estimate at the LGA aggregation level. Between 350 and 400 household questionnaires were expected to be administered per state. These questionnaires were distributed according to a proportionality factor, based on the population of each LGA.

$$S_l = \frac{p}{P} * 400 \tag{2}$$

Where

- S_l = number of questionnaires per LGA
- p = the population of a LGA selected,
- P = the total population of all the selected LGAs,

Thus, the number of households S_v per village was

$$S_v = \frac{S}{v} \tag{3}$$

Where

- v = number of villages selected from a given LGA.

A total of 4400 households were sampled in 748 villages, representing 83 LGAs in 8 states. Preliminary data analysis indicated that coverage of some areas of Nigeria was still insufficient, and sampling of an additional four states using the same sampling techniques was carried out during 2004.

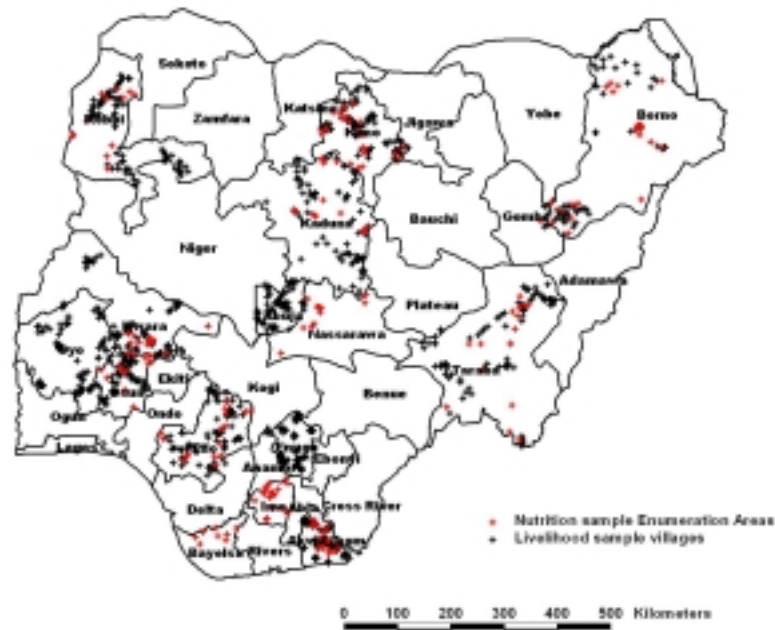


Figure 1. Sample Locations for Rural Livelihoods and Food Consumption and Nutrition Survey

B) Food Consumption and Nutrition Survey (FCNS)

The Food Consumption and Nutrition Survey 2001 (FCNS) is a national survey from which data on the nature and extent of food security, food and nutrient intakes, and anthropometric and biochemical parameters were collected and used to determine the nutritional status of women and children in rural and urban populations in Nigeria. The survey design targeted the entire federation of Nigeria. Considering the obvious and documented relationships between (a) the agroecological zone and type of farming systems; (b) crops grown and foods consumed; and (c) type of food consumed (intake) and micronutrient deficiencies, the federation of Nigeria was initially stratified according to major agroecological zones and predominant food crops within agroecological zones.

Survey design and sampling

A stratified multi-stage procedure, with stratification at 2 levels [agroecological zone * Principal Food Crops] was used. Twelve States, representing a third of the total states of the federation were randomly selected. A total of 72 Local Government Areas (LGAs), 216 Enumeration Areas (EAs) and 30 households from each EA were selected from the selected states, making a total of 6,480 households. A sub-sample of 1080 pregnant women was also included.

Survey tools and manuals

The main data collection instrument (questionnaire) had several sections: questionnaire identification, household/demographic information, socio-economic characteristics of households, food security (food availability and affordability, food consumed away from home, and food-related coping strategies), 24-hr dietary recall, health and care, anthropometry, and biochemical measurements. The following manuals were developed : Survey Design and Operations Manual, Interviewers Manual, Food Instruction Booklet and other survey supporting documents.

The procedures for data collection involved

- Visits to community leaders to introduce the survey
- Mobilization of communities in support of the survey
- Numbering and listing of households and use of maps and local guides to locate sampled households and verify that they meet the selection criteria
- Administering the household questionnaire to all selected households

- Conducting the 24-hour dietary recall with the selected household
- Collecting biochemical samples from mothers and their children under-5 participating in the 24-hour dietary recall
- Conducting the 24-hour recall and collecting biochemical samples from a sub-sample of pregnant women
- Conducting focus group discussions
- Collecting food and salt samples

Table 2. Data sets processed for analysis

| Variable | Children under-5 | Mothers | Pregnant women |
|-------------------------|-------------------------|----------------|-----------------------|
| Household questionnaire | N/A | 5325 | 960 |
| Anthropometry | 5028 | N/A | N/A |
| Vitamin A | 3027 | 3148 | 684 |
| Vitamin E | 3027 | 3148 | 684 |
| Iron | 3091 | 3949 | 829 |
| Zinc | 2725 | 3779 | 795 |
| Iodine | 2428 | 3104 | 660 |
| Body Mass Index | N/A | 5031 | N/A |

A critical component of the FCNS is the food intake portion of the 24-hour dietary recall questionnaire. Respondents were asked to recall what they ate the day before the interview. A guidebook called the Food Instruction Booklet (FIB) was used to aid interviewers in obtaining detailed information on the types of food eaten and the quantity.

The research team in each state consisted of a state supervisor, 4 interview teams with 2 interviewers per team. One pair of the interview teams were the medical laboratory technologists, who were responsible for biological sample (blood and urine) collection and processing. Data collection took place between August and October 2001. All samples were analysed at the Medical Research Council, Tygerberg, Capetown, South Africa.

Only the micronutrient data (Vitamins A and E, Iron, Zinc and Iodine) has so far been made available by the Nutrition research team for mapping. Results for anthropometry and the household questionnaire, especially relationships between malnutrition and diet, will be processed later.

Mapping the Data

Mapping poverty and malnutrition is largely a problem of extrapolation from point data sets based on stratified random sampling to large unsampled areas (Henninger, 1998; Ravallon, 1996). The sampling techniques for the rural livelihoods and child nutrition surveys were different, although the areas covered were similar. Two very different approaches can be used for extrapolation. In the regression technique, exemplified by the Small Area Estimation technique pioneered by the World Bank (Elbers, Lanjouw and Lanjouw, 2002; Elbers et al 2003), a composite regression equation is developed between the variable to be mapped, either an indicator of poverty or development or a measurement of nutrition, measured at sample sites scattered through the study area, and demographic or other socio-economic variables measured, usually in a national census, in all villages or administrative units of the study area. Because of the lack in Nigeria of reliable census data, biophysical variables such as rainfall, soil fertility and vegetation cover and socio-economic variables such as travel times to population centres must be used as proxies for census data. The geostatistical technique is totally different. The variable to be mapped is considered as a regionalised variable (Matheron, 1963), its distribution pattern is analysed, and extrapolation is performed on the basis of the observed distribution, a process known as kriging (Matheron, 1969; Journel and Huijbrechts, 1978).

Indicators of poverty, development and nutrition are mapped at the level of Local Government Areas, the smallest administrative areas for which accurate boundary maps exist in Nigeria. As described above, Rural livelihoods were sampled at the household level, with an average of eight households

sampled per village, and ten villages per LGA. Nutrition was sampled through an average of 20 children from different households in each of three enumeration areas (generally larger than a village) per LGA. When using the small area estimation technique, data was first converted from the household and community level to the LGA level. From the household to the village is a matter of simple arithmetic, since households were selected so as to be representative of the village. Since villages are randomly selected by name from each LGA sampled, their spatial distribution can often be clustered. A test was made using geostatistics to derive spatially adjusted means for LGAs from village data, but it was found that differences between LGA values estimated this way and those derived by simple arithmetic means never differed by more than 5%, and the computationally simple arithmetic mean was used.

A total of eight “independent” variables were used for regression. These were selected on the basis of being available in digital form, and of being fairly objectively derived as well as, hopefully, showing correlation with the socio-economic dependent variables. The variables and their sources are listed in Table 3.

Table 3. Spatial Variables used for Mapping

| Variable | Source |
|-------------------------|--|
| Tree Cover % | MODIS 500 metre 2002 vegetation map of the world. University of Maryland 2003 |
| Grass Cover % | |
| Bare Soil % | |
| Annual Rainfall | CRU, University of East Anglia |
| Soil Fertility | FCC Index from FAO Digital Soil Map of World |
| Population Density | Nigeria Government Census 1992 |
| Number of Households | Data from IITA survey |
| Travel times to markets | Digitised road network, land cover and settlements |

The first three variables are not independent, but are highly correlated in that the sum of all three is, by definition, 100%. In any given district, however, two of the three, for example trees and grass, may be inversely correlated, while the third, soil, shows little or no correlation with either of the other two. Population density is the least “objective” of the variables, based as it is on the 1992 census and subject to serious local distortions. Travel times to markets were calculated for three different sizes of towns; Cities >200,000 people; large towns 50,000-200,000; small towns 20,000-50,000.

Table 4. Zones for Extrapolation

| Zone | Sampled States | Sampled States | Un-Sampled States |
|--------------------|-----------------------|------------------------------|--|
| | Livelihoods | Nutrition | |
| Eastern States | Akwa Ibom, Edo, Enugu | Akwa Ibom, Bayelsa, Edo, Imo | Abia, Anambra, Bayelsa, Cross River, Delta, Ebonyi, Enugu, Imo, Rivers |
| Kaduna / Nassarawa | Abuja, Kaduna | Kaduna, Nassarawa | Abuja, Nassarawa |
| Kano / Kebbi | Kano, Kebbi | Kano, Kebbi | Jigawa, Katsina, Sokoto, Zamfara |
| Kwara / Osun | Kwara, Osun, Oyo | Kwara, Osun | Ekiti, Kogi, Lagos, Ogun, Ondo, Oyo |
| Taraba / Borno | Borno Taraba | Borno Taraba | Adamawa, Bauchi, Benue, Gombe, Yobe |

Raster maps, or grids, were prepared for each of these seven factors for the whole of Nigeria at a resolution of 500 metres. A vector map of LGA boundaries was then used to extract the mean value for each variable for every LGA. For purposes of extrapolation, Nigeria was divided into five zones comprising states with similar agro-ecologies and development status adjacent to states where sampling had been undertaken for the rural livelihood and nutrition surveys. These are listed in Table 4. For each zone, Small Area Estimation using the Poverty and Inequality Mapper Module for SAS (Demombynes,

2002; SAS 2004) started with calculation of regression coefficients between dependent variables (livelihood, nutrition and development indicators) and independent variables (biophysical and socio-economic factors) in the sampled LGAs. If significant correlations were identified, regression equations were then developed and applied to extrapolate dependent variables to the remainder of each zone. The significantly correlated independent variables used in the estimation of Poverty Index, Child Vitamin A and Child Iodine are listed in Table 5.

Where no significant correlations between dependent and independent variables were identified in SAE, values extrapolated by Universal Kriging were used. The Geostatistical Analyst extension of ESRI's ArcGIS9 software (ESRI 2004) was used to derive exponential semi-variograms from village point data, and to analyse anisotropy in the distribution. Universal Kriging was then used to extrapolate values based on the calculated regionalised variables.

The poverty indicator used in this example was mean Daily Household Income in Nigerian Naira, calculated from farm income and production, off-farm and other incomes derived from the household survey. For the purposes of producing the map in Figure 2, values were classified into Very Poor (<N100 pd or US\$0.70); Poor (N100-N150 pd or US\$0.7-1.2); Lower Middle (N150-N250 pd or US\$1.2-1.9); Upper Middle (N250-N500 pd or US\$1.9-3.8) and Relatively Rich (>N500 pd or >US\$3.8).

Table 5. Examples of Significant Correlations from Small Area Estimation

| Dependent Variables | Significant Independent Variables | | | | |
|-----------------------------|---|--|---|--|--|
| | <i>Eastern States</i> | <i>Kaduna/nasarawa</i> | <i>Kano/Kebbi</i> | <i>Kwara/Osun</i> | <i>Taraba/Borno</i> |
| <i>Child Iodine</i> | none | Travel Time Town Travel time large Town Travel Time City Number of Households | Soil Fertility Indicator Y coordinate | Annual Rainfall % grass cover Y coordinate Travel Time City | X coordinate |
| <i>Child Vitamin A</i> | Y coordinate X coordinate Annual Rainfall % soil cover Travel Time Town % tree cover | Annual Rainfall | Annual Rainfall Travel Time Town | Number of Households % grass cover | Travel Time City Total Population Y coordinate |
| <i>Household Livelihood</i> | % soil cover | None | % tree cover % soil cover Total Population Annual Rainfall | X coordinate | X coordinate Travel Time City |

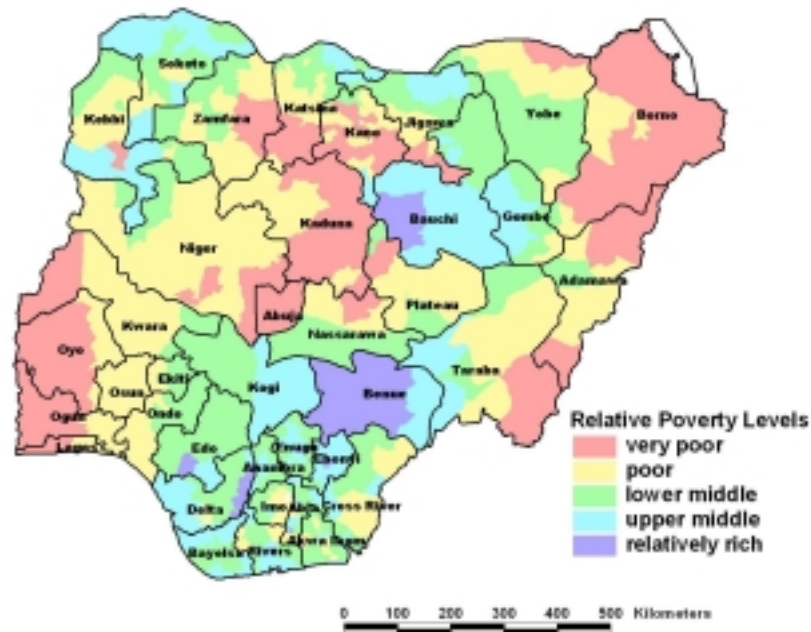


Figure 2. Map of Relative Poverty Levels, based on Household Incomes

Micronutrients were extrapolated as actual values, but can best be visualised in terms of deficiency levels. For serum retinol (Vitamin A), the threshold for marginal deficiency is considered to be at 20 micrograms per decilitre (WHO, 1996), while levels below 10 micrograms per decilitre indicate clinical deficiency. For urinary Iodine, the cut-off for mild deficiency is 100 mcd/lit (ICCIDD.WHO.UNICEF, 2001), moderate deficiency 50 mcd/l and severe deficiency less than 20 mcd/l. These values were used to recalculate raw values to the deficiency indicators used in Figure 3.

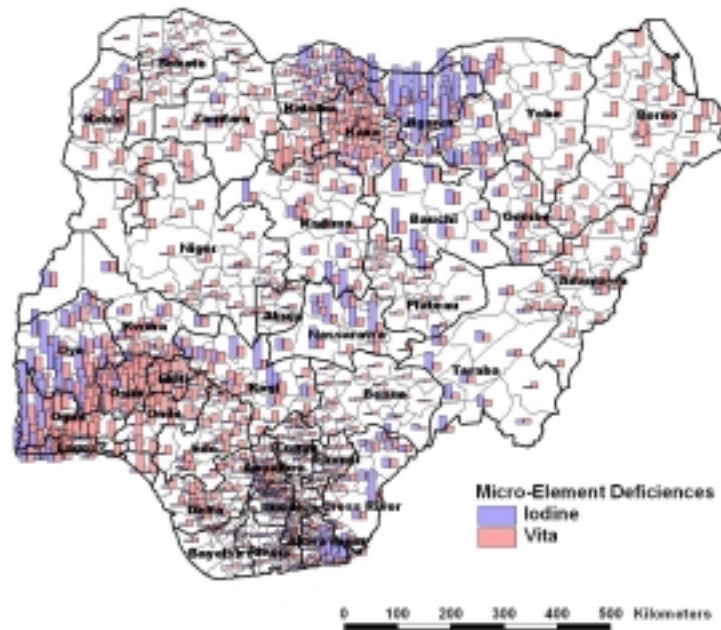


Figure 3. Map of Deficiencies in Two Micro-Nutrients in Children

Results

Livelihoods. The map of estimated relative poverty levels (Figure 2) highlights three major areas of serious poverty in Nigeria. The first is in south-west Nigeria, on the borders with the Benin Republic, in the western portions of Lagos, Ogun, Oyo and Kwara States. The second is in the north-central portion of the country, extending from eastern Niger State, through Abuja and eastern Kaduna to parts of Katsina, Kano and Zamfara States. The third is in the far north-east, occupying most of Borno state and parts of Adamawa and Taraba. The richest areas in Nigeria appear to be in the western parts of Benue and Bauchi States, with some isolated LGAs in Edo and Delta states.

Nutrition. Only micronutrient data have so far been mapped, and examples of two micronutrients are presented as examples. Iodine deficiency is most prevalent in the south-west, in Lagos, Ogun and Oyo states, in the centre, in parts of Kogi, Nassarawa, Kaduna, Bauchi and Plateau states, and in the far north, in Jigawa and Katsina states. There is another pocket of deficiency in the Niger Delta area, mainly in Akwa Ibom. Vitamin A deficiency is often not co-located with iodine deficiency, and is most prevalent in Ogun, Osun, Ekiti and Ondo states in the south-west, Kano and Katsina states in the north, and Borno, Gombe, Yobe and Adamawa states in the north-east.

Table 6. R2 Correlation Coefficients between Nutrition, Poverty and Development Indicators

| | Iodine | Vitamin A | Livelihood | Primary School | Secondary School | Health Centre | Public Toilet | Electricity | Tap Water | Well Water |
|------------------|---------|-----------|------------|----------------|------------------|---------------|---------------|-------------|-----------|------------|
| Iodine | 0 | | | | | | | | | |
| Vitamin A | -0.007 | 0 | | | | | | | | |
| Livelihood | 0.0116 | -0.216 | 0 | | | | | | | |
| Primary School | 0.0065 | 0.0253 | 0 | 0 | | | | | | |
| Secondary School | 0.0085 | 0.0325 | -0.0996 | 0.2001 | 0 | | | | | |
| Health Centre | 0.0763 | -0.029 | 0 | 0.1835 | 0.5176 | 0 | | | | |
| Public Toilet | -0.0033 | -0.001 | 0.0061 | 0.0023 | 0.0026 | 0.041 | 0 | | | |
| Electricity | 0.0258 | 0.0221 | -0.0562 | -0.0029 | 0.0115 | 0.0237 | -0.006 | 0 | | |
| Tap Water | 0.0054 | 0.0185 | -0.1541 | 0.1662 | 0.2803 | 0.3178 | 0.0045 | 0.0643 | 0 | |
| Well Water | 0 | 0.008 | -0.0052 | -0.0954 | 0.0087 | -0.004 | 0 | 0.0884 | -0.016 | 0 |

Correlations between Livelihood, Nutrition and Development Indicators. Table 6 shows a matrix of correlation coefficients between nutrition, livelihood and development indicators. As might be expected, the internal correlations between different indicators of development (distances to schools, health centres, tap water) are very strong, although distances to the electricity grid and public toilets show poor correlation with the other indicators. Livelihoods correlate poorly with other indicators, except for a strong negative correlation with vitamin A deficiency (see also Figure 4) and a less strong correlation with distance to tap water. The nutrition indicators show generally poor correlation with other indicators, iodine deficiency showing only very weak correlations with livelihoods (positive) and with distance to electricity, while Vitamin A shows a strong negative correlation with Livelihoods, and weak correlations with most of the development indicators.

Drivers of Poverty and Malnutrition. The use of Small Area Estimation to extrapolate Livelihood, Nutrition and development indicators based on regression against biophysical and socio-economic factors relies on correlation between these dependent and independent variables, and thus provides an indication of some of the factors controlling the indicators. The correlations vary from zone to zone, as shown in Table 5. Some common factors emerge, however.

Household livelihoods are strongly correlated with percentage bare soil (as observed by MODIS) in the Eastern States and in the Kano/Kebbi zone. The X-coordinate (relative position east or west) is important in the Kwara/Osun zone and in the Taraba/Borno zone. Travel time to city markets is important in the Taraba/Borno zone, and tree-cover, total population and annual rainfall in the Kano/Kebbi zone. The percentage of bare soil can indicate both the area of land cleared for cultivation

and the severity of soil erosion in the zone, and both of these could have connections with livelihood and poverty. The correlation with east-west location is unexpected, since most obvious gradients in Nigeria (rainfall and vegetation especially) are north-south.

Vitamin A levels correlate with annual rainfall in three of the five zones, with travel time to town markets in two zones, and with the Y-coordinate in two zones. Annual rainfall has a major effect on preferred agricultural systems, and on crop yields, so it is unsurprising that a nutrition indicator is correlated with it, while rainfall change is mainly in a north-south direction, the direction of greatest rainfall gradient in most of the country.

In the case of iodine levels, the only common factor linking more than one zone is travel time to city markets, which is important in two zones. Apart from this, different independent variables are important in each zone.

Much more work, especially on farming systems and diet, is required before drivers of poverty and malnutrition can be more closely defined.

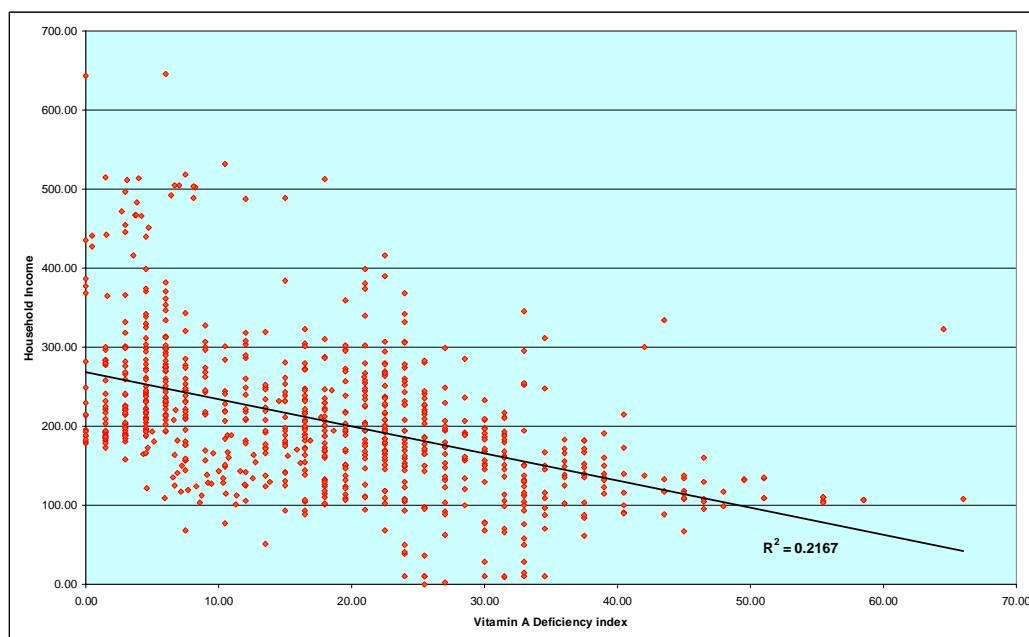


Figure 4. Correlation between Household Income and Child Vitamin A Deficiency

Conclusions

This initial study of the spatial distribution of poverty, malnutrition and development indicators in Nigeria has shown that it is possible to map these types of socio-economic indicators, even in the absence of reliable census data. Broad trends of variability can be identified, and spatial zonation of indicators revealed, although statistical estimates of the reliability of the extrapolation cannot be made.

Severe rural poverty appears to be found in the south-west of Nigeria, in the north-centre, and in the extreme north-east. Iodine deficiency in children is most common in the south-west, centre, and extreme north. Vitamin A deficiency in children is prevalent in the south-west and north-east.

Correlations between livelihoods and iodine deficiency are weak or absent, while vitamin A deficiency shows a strong negative correlation with livelihoods. This suggests that vitamin A levels might depend more on general nutritional standards related to incomes, while iodine is more related to regional differences in dietary habits.

Development indicators such as distances to schools, health centres and piped water are strongly correlated with each other, although distance to mains electricity is less correlated with the other indicators, and distance to public toilets shows no correlation with any other variable.

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Appendix 1. Example data collected on Development Indicators

| Parameter | Inua-Eyetikot | Iwuo Achang | Iwuo Okpom | Mkpanak |
|--|---------------|-------------|------------|---------|
| vf1a__Presence of primary school | 0 | 0 | 1 | 1 |
| vf2a__Presence of secondary school | 1 | 0 | 0 | 1 |
| vf3a__Presence of hospital/clinic | 0 | 0 | 0 | 0 |
| vf4a__Presence of public toilet | 0 | 0 | 0 | 0 |
| vf5a__Presence of electricity | 0 | 0 | 0 | 0 |
| vf6a__Presence of water (tap) | 0 | 0 | 0 | 0 |
| vf7a__Presence of water (wells) | 0 | 0 | 0 | 0 |
| vf1b__Distance to nearest primary school | 2 | 4 | | |
| vf2b__Distance to nearest secondary school | | 16 | 10 | |
| vf3b__Distance to nearest hospital/clinic | 8 | 16 | 6 | 10 |
| vf4b__Distance to nearest public toilet | 8 | 16 | 6 | 10 |
| vf5b__Distance to nearest electricity | 8 | 16 | 6 | 10 |
| vf6b__Distance to nearest water (tap) | 8 | 16 | 6 | 10 |
| vf7b__Distance to nearest water (wells) | 8 | 17 | 12 | 10 |
| vf1c__Cost to go to primary school (N) | 20 | 40 | | |
| vf2c__Cost to go to secondary school (N) | | 80 | 80 | |
| vf3c__Cost to go to hospital/clinic (N) | 100 | 80 | 50 | 150 |
| vf4c__Cost to go to public toilet (N) | 100 | 80 | 50 | 150 |
| vf5c__Cost to go to electricity (N) | 100 | 80 | 50 | 150 |
| vf6c__Cost to go to water (tap) (N) | 100 | 80 | 50 | 150 |
| vf7c__Cost to go to water (wells) (N) | 100 | 100 | 100 | 150 |
| vv1a__Presence of formal credit/microcredit/bank | 1 | 1 | 0 | 1 |
| vv2a__Presence of fertilizer dealer | 0 | 0 | 0 | 0 |
| vv3a__Presence of pesticide/herbicide dealer | 0 | 0 | 0 | 0 |
| vv4a__Presence of improved seed | 0 | 0 | 0 | 0 |
| vv5a__Presence of extension agent | 0 | 0 | 1 | 0 |
| vv6a__Presence of veterinary clinic/Doctor | 0 | 0 | 0 | 0 |
| vv7a__Presence of other village institutions | 0 | 0 | 0 | 0 |
| vv1b__Distance to nearest source of formal credit/microcredit/bank | 10 | | 16 | |
| vv2b__Distance to nearest source of fertilizer dealer | 27 | 7 | 24 | 8 |
| vv3b__Distance to nearest source of pesticide/herbicide dealer | 27 | 7 | 24 | 8 |
| vv4b__Distance to nearest source of improved seed | 27 | 7 | 24 | 8 |
| vv5b__Distance to nearest source of extension agent | 27 | 7 | | 8 |
| vv6b__Distance to nearest source of veterinary clinic/Doctor | 27 | 7 | 16 | 8 |
| vv7b__Distance to nearest source of other village institutions | | 7 | | 8 |
| vv1c__Cost to go to formal credit/microcredit/bank | 20 | | 80 | |
| vv2c__Cost to go to fertilizer dealer | 50 | 40 | 150 | 40 |
| vv3c__Cost to go to pesticide/herbicide dealer | 50 | 40 | 150 | 40 |
| vv4c__Cost to go to improved seed | 50 | 40 | 150 | 40 |
| vv5c__Cost to go to extension agent | 50 | 40 | | 40 |
| vv6c__Cost to go to veterinary clinic/Doctor | 50 | 40 | 80 | 40 |
| vv7c__Cost to go to other village institutions | | 40 | | 40 |

Appendix 2. Example data on blood Micronutrients

| LGA | Gada | Illela | Tangaza | Abadam | Sabon Birni |
|-----------------------------------|--------|--------|---------|--------|-------------|
| Child mean Iodine | 449.99 | 336.16 | 266.90 | 487.35 | 333.60 |
| Mother mean Iodine | 272.05 | 230.13 | 199.34 | 432.13 | 224.83 |
| Pregnant mother mean Iodine | 236.68 | 220.42 | 200.30 | 268.41 | 221.37 |
| Child mean Iron | 47.12 | 46.81 | 44.45 | 19.45 | 44.57 |
| Mother mean Iron | 22.28 | 22.22 | 24.20 | 34.10 | 22.99 |
| Pregnant mother mean Iron | 29.76 | 29.83 | 29.69 | 18.23 | 30.27 |
| Child mean Vitamin A | 38.94 | 38.82 | 37.51 | 20.26 | 37.44 |
| Mother mean Vitamin A | 21.13 | 18.19 | 16.11 | 39.12 | 19.43 |
| Pregnant mean Vitamin A | 41.38 | 41.78 | 44.40 | 32.53 | 38.22 |
| Child mean Vitamin E | 6.53 | 6.52 | 6.41 | 6.28 | 6.50 |
| Mother mean Vitamin E | 9.02 | 7.53 | 6.79 | 7.37 | 7.57 |
| Pregnant mean Vitamin E | 8.02 | 7.87 | 7.82 | 10.42 | 8.02 |
| Mother mean Zinc | 76.59 | 76.58 | 76.44 | 104.83 | 76.50 |
| Pregnant mean Zinc | 69.51 | 69.50 | 69.32 | 97.51 | 69.40 |
| Child lower quartile Iron | 24.82 | 24.64 | 23.22 | 8.17 | 23.29 |
| Child upper quartile Iron | 66.5 | 66.2 | 64.2 | 43.5 | 64.3 |
| Mother lower quartile Iron | 8.00 | 7.96 | 9.47 | 17.01 | 8.54 |
| Mother upper quartile Iron | 46.33 | 46.27 | 48.36 | 58.85 | 47.08 |
| Pregnant lower quartile Iron | 14.90 | 14.93 | 14.86 | 8.81 | 15.16 |
| Pregnant upper quartile Iron | 61.53 | 61.62 | 61.44 | 46.64 | 62.19 |
| Child lower quartile Vitamin A | 28.50 | 28.42 | 27.54 | 15.88 | 27.49 |
| Child upper quartile Vitamin A | 47.74 | 47.60 | 46.04 | 25.51 | 45.96 |
| Mother lower quartile Vitamin A | 17.48 | 15.02 | 13.27 | 32.55 | 16.06 |
| Mother upper quartile Vitamin A | 30.26 | 27.33 | 25.26 | 48.18 | 28.56 |
| Pregnant lower quartile Vitamin A | 36.12 | 36.48 | 38.90 | 27.97 | 33.21 |
| Pregnant upper quartile Vitamin A | 48.50 | 48.89 | 51.48 | 39.77 | 45.38 |
| Child lower quartile Vitamin E | 4.77 | 4.76 | 4.65 | 4.52 | 4.74 |
| Child upper quartile Vitamin E | 8.32 | 8.31 | 8.20 | 8.07 | 8.29 |
| Mother lower quartile Vitamin E | 7.29 | 6.11 | 5.53 | 5.98 | 6.14 |
| Mother upper quartile Vitamin E | 10.57 | 9.08 | 8.33 | 8.92 | 9.12 |
| Pregnant lower quartile Vitamin E | 6.60 | 6.45 | 6.41 | 8.92 | 6.60 |
| Pregnant upper quartile Vitamin E | 9.24 | 9.10 | 9.06 | 11.46 | 9.24 |
| Mother lower quartile Zinc | 66.96 | 66.95 | 66.82 | 91.92 | 66.88 |
| Mother upper quartile Zinc | 91.27 | 91.26 | 91.12 | 118.70 | 91.18 |
| Pregnant lower quartile Zinc | 62.15 | 62.14 | 61.98 | 87.52 | 62.05 |
| Pregnant upper quartile Zinc | 80.95 | 80.94 | 80.76 | 109.51 | 80.84 |
| Child lower quartile Iodine | 236.95 | 179.23 | 144.11 | 255.90 | 177.93 |
| Child upper quartile Iodine | 716.82 | 553.94 | 454.84 | 770.28 | 550.28 |
| Mother lower quartile Iodine | 161.40 | 135.97 | 117.30 | 258.49 | 132.76 |
| Mother upper quartile Iodine | 403.93 | 349.03 | 308.71 | 613.59 | 342.09 |
| Pregnant lower quartile Iodine | 163.83 | 150.25 | 133.45 | 190.33 | 151.04 |
| Pregnant upper quartile Iodine | 345.12 | 327.95 | 306.70 | 378.63 | 328.96 |

Appendix 3. Calculated mean household incomes and iodine and vitamin A deficiencies by Local Government Area for Nigeria

| STATE | LGA | Iodine deficiency | Vitamin A deficiency | Income |
|-----------|-------------------|-------------------|----------------------|--------|
| Abia | Aba North | 0.00 | 0.00 | 642.62 |
| Abia | Aba South | 0.00 | 1.50 | 514.67 |
| Abia | Arochukwu | 0.00 | 4.50 | 249.50 |
| Abia | Bende | 0.00 | 3.00 | 226.36 |
| Abia | Ikwuano | 0.00 | 4.50 | 195.21 |
| Abia | Isiala Ngwa North | 0.00 | 3.00 | 188.90 |
| Abia | Isiala Ngwa South | 0.00 | 1.50 | 279.39 |
| Abia | Isuikwuato | 0.00 | 3.00 | 203.33 |
| Abia | Oboma Ngwa | 0.00 | 3.00 | 221.01 |
| Abia | Ohafia | 0.00 | 3.00 | 267.65 |
| Abia | Osisioma Ngwa | 0.00 | 1.50 | 279.39 |
| Abia | Ugwunagbo | 0.00 | 1.50 | 186.89 |
| Abia | Ukwa East | 0.00 | 3.00 | 189.19 |
| Abia | Ukwa West | 0.00 | 1.50 | 184.32 |
| Abia | Umuahia North | 0.00 | 3.00 | 298.75 |
| Abia | Umuahia South | 0.00 | 3.00 | 191.45 |
| Abia | Umu-Nneochi | 0.00 | 1.50 | 284.26 |
| Abuja | Abaji | 0.00 | 11.98 | 126.16 |
| Abuja | Abuja Municipal | 0.00 | 6.58 | 134.76 |
| Abuja | Bwari | 0.00 | 4.59 | 121.16 |
| Abuja | Gwagwalada | 0.00 | 9.16 | 128.35 |
| Abuja | Kuje | 0.00 | 9.43 | 127.34 |
| Abuja | Kwali | 0.00 | 11.28 | 100.71 |
| Adamawa | Demsa | 0.00 | 21.00 | 205.08 |
| Adamawa | Fufore | 0.00 | 19.50 | 146.40 |
| Adamawa | Ganye | 0.00 | 13.50 | 137.67 |
| Adamawa | Girie | 0.00 | 25.50 | 95.85 |
| Adamawa | Gombi | 0.00 | 22.50 | 183.53 |
| Adamawa | Guyuk | 0.00 | 22.50 | 177.64 |
| Adamawa | Hong | 0.00 | 24.00 | 40.39 |
| Adamawa | Jada | 0.00 | 15.00 | 141.46 |
| Adamawa | Lamurde | 0.00 | 19.50 | 195.16 |
| Adamawa | Madagali | 0.00 | 27.00 | 42.15 |
| Adamawa | Maiha | 0.00 | 24.00 | 49.47 |
| Adamawa | Mayo-Belwa | 0.00 | 15.00 | 179.03 |
| Adamawa | Michika | 0.00 | 25.50 | 50.00 |
| Adamawa | Mubi North | 0.00 | 25.50 | 50.00 |
| Adamawa | Mubi South | 0.00 | 25.50 | 40.08 |
| Adamawa | Numan | 0.00 | 19.50 | 199.63 |
| Adamawa | Shelleng | 0.00 | 24.00 | 150.08 |
| Adamawa | Song | 0.00 | 24.00 | 122.75 |
| Adamawa | Teungo | 0.00 | 12.00 | 105.28 |
| Adamawa | Yola North | 0.00 | 19.50 | 203.52 |
| Adamawa | Yola South | 0.00 | 18.00 | 187.52 |
| Akwa Ibom | Abak | 0.00 | 3.00 | 216.78 |
| Akwa Ibom | Eastern Obolo | 0.00 | 4.50 | 278.69 |
| Akwa Ibom | Eket | 2.50 | 4.50 | 258.86 |
| Akwa Ibom | Esit Eket | 11.00 | 6.00 | 194.32 |
| Akwa Ibom | Essien Udim | 0.00 | 3.00 | 204.20 |

| | | | | |
|-----------|--------------------|-------|-------|--------|
| Akwa Ibom | Etim Ekpo | 0.00 | 3.00 | 184.55 |
| Akwa Ibom | Etinan | 0.00 | 4.50 | 218.29 |
| Akwa Ibom | Ibeno | 8.00 | 6.00 | 298.27 |
| Akwa Ibom | Ibesikpo Asutan | 19.00 | 4.50 | 187.80 |
| Akwa Ibom | Ibiono Ibom | 0.00 | 4.50 | 230.94 |
| Akwa Ibom | Ika | 0.00 | 3.00 | 188.22 |
| Akwa Ibom | Ikono | 0.00 | 4.50 | 193.40 |
| Akwa Ibom | Ikot Abasi | 0.00 | 4.50 | 245.73 |
| Akwa Ibom | Ikot Ekpene | 0.00 | 4.50 | 238.02 |
| Akwa Ibom | Ini | 0.00 | 4.50 | 210.76 |
| Akwa Ibom | Itu | 14.00 | 3.00 | 225.19 |
| Akwa Ibom | Mbo | 23.50 | 4.50 | 208.68 |
| Akwa Ibom | Mkpat Enin | 0.00 | 4.50 | 217.88 |
| Akwa Ibom | Nsit Atai | 32.00 | 4.50 | 196.10 |
| Akwa Ibom | Nsit Ibom | 8.00 | 4.50 | 188.22 |
| Akwa Ibom | Nsit Ubium | 12.50 | 4.50 | 192.99 |
| Akwa Ibom | Obot Akara | 0.00 | 4.50 | 196.54 |
| Akwa Ibom | Okobo | 29.50 | 4.50 | 221.61 |
| Akwa Ibom | Onna | 0.00 | 4.50 | 242.98 |
| Akwa Ibom | Oron | 29.50 | 4.50 | 329.93 |
| Akwa Ibom | Oruk Anam | 0.00 | 3.00 | 197.94 |
| Akwa Ibom | Udung Uko | 33.00 | 4.50 | 199.66 |
| Akwa Ibom | Ukanafun | 0.00 | 3.00 | 187.45 |
| Akwa Ibom | Uruan | 23.00 | 4.50 | 196.80 |
| Akwa Ibom | Urue Offong /Oruko | 30.00 | 6.00 | 213.28 |
| Akwa Ibom | Uyo | 10.50 | 4.50 | 303.81 |
| Anambra | Oyi | 0.00 | 6.00 | 370.16 |
| Anambra | Aguata | 0.00 | 6.00 | 207.78 |
| Anambra | Anambra East | 0.00 | 6.00 | 312.14 |
| Anambra | Anambra West | 0.00 | 7.50 | 244.21 |
| Anambra | Anaocha | 0.00 | 6.00 | 234.93 |
| Anambra | Awka North | 0.00 | 6.00 | 242.76 |
| Anambra | Awka South | 0.00 | 6.00 | 282.92 |
| Anambra | Ayamelum | 0.00 | 7.50 | 213.30 |
| Anambra | Dunukofia | 0.00 | 6.00 | 302.71 |
| Anambra | Ekwusigo | 0.00 | 6.00 | 236.61 |
| Anambra | Idemili North | 0.00 | 6.00 | 273.80 |
| Anambra | Idemili South | 0.00 | 6.00 | 274.58 |
| Anambra | Ihiala | 0.00 | 3.00 | 223.04 |
| Anambra | Njikoka | 0.00 | 6.00 | 273.69 |
| Anambra | Nnewi North | 0.00 | 4.50 | 283.83 |
| Anambra | Nnewi South | 0.00 | 4.50 | 222.66 |
| Anambra | Ogbaru | 0.00 | 4.50 | 325.30 |
| Anambra | Onitsha North | 0.00 | 6.00 | 645.10 |
| Anambra | Onitsha South | 0.00 | 6.00 | 381.96 |
| Anambra | Orumba North | 0.00 | 6.00 | 221.48 |
| Anambra | Orumba South | 0.00 | 3.00 | 214.58 |
| Bauchi | Alkali | 22.50 | 19.50 | 296.69 |
| Bauchi | Bauchi | 36.00 | 21.00 | 381.17 |
| Bauchi | Bogoro | 44.50 | 19.50 | 359.22 |
| Bauchi | Damban | 15.50 | 22.50 | 237.63 |
| Bauchi | Darazo | 19.00 | 21.00 | 258.00 |
| Bauchi | Dass | 48.00 | 21.00 | 398.48 |

| | | | | |
|---------|------------------|-------|-------|--------|
| Bauchi | Gamawa | 21.00 | 25.50 | 226.25 |
| Bauchi | Ganjuwa | 33.00 | 24.00 | 342.18 |
| Bauchi | Giade | 29.00 | 21.00 | 254.68 |
| Bauchi | Itas/Gadau | 40.50 | 24.00 | 260.54 |
| Bauchi | Jama'are | 38.00 | 24.00 | 274.27 |
| Bauchi | Katagum | 25.50 | 22.50 | 225.99 |
| Bauchi | Kirfi | 21.50 | 24.00 | 306.66 |
| Bauchi | Misau | 22.00 | 21.00 | 243.82 |
| Bauchi | Ningi | 55.00 | 24.00 | 368.02 |
| Bauchi | Shira | 32.50 | 22.50 | 265.53 |
| Bauchi | Tafawa-Balewa | 47.00 | 22.50 | 390.06 |
| Bauchi | Toro | 55.50 | 22.50 | 416.10 |
| Bauchi | Warji | 41.50 | 24.00 | 332.24 |
| Bauchi | Zaki | 35.50 | 27.00 | 228.99 |
| Bayelsa | Brass | 0.00 | 4.50 | 293.85 |
| Bayelsa | Ekeremor | 0.00 | 6.00 | 269.53 |
| Bayelsa | Kolokuma/Opokuma | 0.00 | 1.50 | 299.63 |
| Bayelsa | Nembe | 0.00 | 6.00 | 231.87 |
| Bayelsa | Ogbia | 0.00 | 4.50 | 204.43 |
| Bayelsa | Sagbama | 0.00 | 4.50 | 341.48 |
| Bayelsa | Southern Ijaw | 0.00 | 4.50 | 231.03 |
| Bayelsa | Yenegoa | 0.00 | 1.50 | 277.40 |
| Benue | Ado | 0.00 | 8.09 | 503.54 |
| Benue | Agatu | 0.00 | 7.06 | 504.37 |
| Benue | Apa | 0.00 | 6.68 | 504.70 |
| Benue | Bukuru | 0.00 | 1.57 | 441.53 |
| Benue | Gboko | 0.00 | 2.70 | 471.87 |
| Benue | Guma | 0.00 | 3.72 | 467.09 |
| Benue | Gwer East | 0.00 | 3.87 | 483.31 |
| Benue | Gwer West | 0.00 | 4.00 | 513.34 |
| Benue | Katsina- Ala | 0.00 | 0.00 | 377.30 |
| Benue | Konshisha | 1.00 | 2.97 | 454.66 |
| Benue | Kwande | 9.90 | 0.00 | 368.47 |
| Benue | Logo | 0.00 | 3.59 | 416.28 |
| Benue | Markurdi | 0.00 | 3.13 | 511.41 |
| Benue | Obi | 0.00 | 3.79 | 467.08 |
| Benue | Ogbadigbo | 0.00 | 10.45 | 532.16 |
| Benue | Ohimini | 0.00 | 8.09 | 488.62 |
| Benue | Oju | 0.00 | 4.70 | 450.97 |
| Benue | Okpokwu | 0.00 | 8.27 | 501.87 |
| Benue | Oturkpo | 0.00 | 6.43 | 491.57 |
| Benue | Tarka | 0.00 | 4.19 | 465.83 |
| Benue | Ukum | 0.00 | 1.65 | 365.24 |
| Benue | Ushongo | 4.09 | 0.45 | 440.60 |
| Benue | Vandeikya | 19.09 | 0.48 | 427.39 |
| Borno | Abadam | 0.00 | 33.00 | 68.68 |
| Borno | Askira/Uba | 0.00 | 25.50 | 55.83 |
| Borno | Bama | 0.00 | 30.00 | 50.00 |
| Borno | Bayo | 0.00 | 27.00 | 207.06 |
| Borno | Biu | 0.00 | 27.00 | 131.54 |
| Borno | Chibok | 0.00 | 27.00 | 62.79 |
| Borno | Dambo | 0.00 | 28.50 | 99.70 |
| Borno | Dikwa | 0.00 | 33.00 | 50.00 |

| | | | | |
|-------------|-------------------|-------|-------|--------|
| Borno | Gubio | 0.00 | 33.00 | 111.96 |
| Borno | Guzamala | 0.00 | 33.00 | 58.17 |
| Borno | Gwoza | 0.00 | 30.00 | 68.25 |
| Borno | Hawul | 0.00 | 25.50 | 97.26 |
| Borno | Jere | 0.00 | 33.00 | 137.15 |
| Borno | Kaga | 0.00 | 30.00 | 156.33 |
| Borno | Kala/Balge | 0.00 | 31.50 | 50.00 |
| Borno | Konduga | 0.00 | 31.50 | 113.30 |
| Borno | Kukawa | 0.00 | 31.50 | 49.33 |
| Borno | Kwaya Kusar | 0.00 | 25.50 | 169.30 |
| Borno | Mafa | 0.00 | 34.50 | 70.40 |
| Borno | Magumeri | 0.00 | 31.50 | 145.04 |
| Borno | Maiduguri | 0.00 | 30.00 | 152.73 |
| Borno | Marte | 0.00 | 33.00 | 44.62 |
| Borno | Mobbar | 0.00 | 33.00 | 75.93 |
| Borno | Monguno | 0.00 | 33.00 | 49.68 |
| Borno | Ngala | 0.00 | 34.50 | 50.00 |
| Borno | Nganzai | 0.00 | 31.50 | 98.64 |
| Borno | Shani | 0.00 | 24.00 | 153.43 |
| Cross River | Abi | 0.00 | 4.50 | 270.14 |
| Cross River | Akamkpa | 17.00 | 13.50 | 194.32 |
| Cross River | Akpabuyo | 8.00 | 7.50 | 221.95 |
| Cross River | Bakassi | 8.50 | 6.00 | 289.30 |
| Cross River | Bekwarra | 14.50 | 13.50 | 246.22 |
| Cross River | Biase | 8.50 | 9.00 | 296.34 |
| Cross River | Boki | 20.50 | 18.00 | 194.32 |
| Cross River | Calabar Municipal | 12.50 | 6.00 | 360.94 |
| Cross River | Calabar South | 14.50 | 4.50 | 373.46 |
| Cross River | Etung | 73.00 | 21.00 | 373.46 |
| Cross River | Ikom | 20.00 | 15.00 | 210.96 |
| Cross River | Obanliku | 14.50 | 15.00 | 188.67 |
| Cross River | Obubra | 5.00 | 12.00 | 248.43 |
| Cross River | Obudu | 16.50 | 15.00 | 239.18 |
| Cross River | Odukpani | 15.00 | 7.50 | 247.63 |
| Cross River | Ogoja | 13.50 | 13.50 | 219.40 |
| Cross River | Yakurr | 0.00 | 9.00 | 217.96 |
| Cross River | Yala | 9.00 | 7.50 | 253.16 |
| Delta | Aniocha North | 0.00 | 12.00 | 207.85 |
| Delta | Aniocha South | 0.00 | 12.00 | 222.03 |
| Delta | Bomadi | 0.00 | 10.50 | 284.21 |
| Delta | Burutu | 0.00 | 12.00 | 318.11 |
| Delta | Ethiope East | 0.00 | 15.00 | 232.35 |
| Delta | Ethiope West | 0.00 | 16.50 | 245.35 |
| Delta | Ika North East | 0.00 | 12.00 | 208.76 |
| Delta | Ika South | 0.00 | 13.50 | 252.02 |
| Delta | Isoko North | 0.00 | 7.50 | 218.20 |
| Delta | Isoko South | 0.00 | 6.00 | 212.96 |
| Delta | Ndokwa East | 0.00 | 4.50 | 439.28 |
| Delta | Ndokwa West | 0.00 | 9.00 | 214.38 |
| Delta | Okpe | 0.00 | 19.50 | 217.22 |
| Delta | Oshimili North | 0.00 | 7.50 | 343.51 |
| Delta | Oshimili South | 0.00 | 7.50 | 518.37 |
| Delta | Patani | 0.00 | 4.50 | 298.77 |

| | | | | |
|--------|-------------------|------|-------|--------|
| Delta | Sapele | 0.00 | 19.50 | 295.28 |
| Delta | Udu | 0.00 | 18.00 | 310.68 |
| Delta | Ughelli North | 0.00 | 10.50 | 240.88 |
| Delta | Ughelli South | 0.00 | 15.00 | 194.22 |
| Delta | Ukwuani | 0.00 | 10.50 | 244.72 |
| Delta | Uvwie | 0.00 | 15.00 | 384.52 |
| Delta | Warri North | 0.00 | 18.00 | 287.33 |
| Delta | Warri South | 0.00 | 21.00 | 339.21 |
| Delta | Warri South-West | 0.00 | 18.00 | 286.45 |
| Ebony | Ishielu | 0.00 | 1.50 | 296.49 |
| Ebonyi | Abakaliki | 4.00 | 7.50 | 320.73 |
| Ebonyi | Afikpo North | 0.00 | 3.00 | 281.31 |
| Ebonyi | Afikpo South | 0.00 | 3.00 | 214.38 |
| Ebonyi | Ebonyi | 0.00 | 6.00 | 346.88 |
| Ebonyi | Ezza North | 0.00 | 3.00 | 445.93 |
| Ebonyi | Ezza South | 0.00 | 4.50 | 370.03 |
| Ebonyi | Ikwo | 0.00 | 7.50 | 284.91 |
| Ebonyi | Ivo | 0.00 | 1.50 | 221.49 |
| Ebonyi | Izzi | 0.00 | 9.00 | 326.71 |
| Ebonyi | Ohaozara | 0.00 | 3.00 | 265.44 |
| Ebonyi | Ohaukwu | 0.00 | 3.00 | 366.37 |
| Ebonyi | Onicha | 0.00 | 3.00 | 301.32 |
| Edo | Akoko-Edo | 0.00 | 18.00 | 229.51 |
| Edo | Egor | 0.00 | 12.00 | 487.26 |
| Edo | Esan Central | 0.00 | 15.00 | 198.03 |
| Edo | Esan North-East | 0.00 | 15.00 | 232.28 |
| Edo | Esan South-East | 0.00 | 12.00 | 260.28 |
| Edo | Esan West | 0.00 | 16.50 | 247.44 |
| Edo | Etsako Central | 0.00 | 15.00 | 253.92 |
| Edo | Etsako East | 0.00 | 13.50 | 249.16 |
| Edo | Etsako West | 0.00 | 16.50 | 238.15 |
| Edo | Igueben | 0.00 | 16.50 | 199.66 |
| Edo | Ikpoba-Okha | 0.00 | 18.00 | 512.71 |
| Edo | Oredo | 0.00 | 15.00 | 488.23 |
| Edo | Orhionmwon | 0.00 | 15.00 | 281.14 |
| Edo | Ovia North-East | 0.00 | 16.50 | 205.54 |
| Edo | Ovia South-West | 0.00 | 16.50 | 221.91 |
| Edo | Owan East | 0.00 | 16.50 | 215.62 |
| Edo | Owan West | 0.00 | 16.50 | 208.09 |
| Edo | Uhunmwonde | 0.00 | 18.00 | 246.99 |
| Ekiti | Ado-Ekiti | 0.00 | 27.00 | 196.21 |
| Ekiti | Efon | 0.00 | 24.00 | 182.56 |
| Ekiti | Ekiti East | 0.00 | 22.50 | 216.48 |
| Ekiti | Ekiti South-West | 0.00 | 31.50 | 187.80 |
| Ekiti | Ekiti West | 0.00 | 30.00 | 186.29 |
| Ekiti | Emure | 0.00 | 24.00 | 208.11 |
| Ekiti | Gboyin | 0.00 | 22.50 | 207.76 |
| Ekiti | Ido-Osi | 0.00 | 22.50 | 192.04 |
| Ekiti | Ijero | 1.00 | 25.50 | 185.68 |
| Ekiti | Ikere | 0.00 | 24.00 | 194.07 |
| Ekiti | Ikole | 0.00 | 25.50 | 208.52 |
| Ekiti | Ilejemeje | 0.00 | 21.00 | 193.98 |
| Ekiti | Irepodun/Ifelodun | 0.00 | 16.50 | 195.88 |

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|-------|-------------------|-------|-------|--------|
| Ekiti | Ise /Orun | 0.00 | 25.50 | 202.94 |
| Ekiti | Moba | 0.00 | 28.50 | 189.86 |
| Ekiti | Oye | 0.00 | 22.50 | 199.99 |
| Enugu | Aninri | 0.00 | 0.00 | 229.70 |
| Enugu | Awgu | 0.00 | 1.50 | 258.51 |
| Enugu | Enugu East | 0.00 | 4.50 | 272.25 |
| Enugu | Enugu North | 0.00 | 4.50 | 398.96 |
| Enugu | Enugu South | 0.00 | 4.50 | 329.90 |
| Enugu | Ezeagu | 0.00 | 4.50 | 241.60 |
| Enugu | Igbo-Etiti | 0.00 | 6.00 | 333.99 |
| Enugu | Igbo-eze North | 0.00 | 6.00 | 202.72 |
| Enugu | Igbo-eze South | 0.00 | 6.00 | 225.99 |
| Enugu | Isi-Uzo | 0.00 | 4.50 | 210.51 |
| Enugu | Nkanu East | 0.00 | 1.50 | 240.74 |
| Enugu | Nkanu West | 0.00 | 3.00 | 299.80 |
| Enugu | Nsukka | 0.00 | 6.00 | 274.47 |
| Enugu | Oji-River | 0.00 | 4.50 | 215.93 |
| Enugu | Udenu | 0.00 | 6.00 | 260.29 |
| Enugu | Udi | 0.00 | 4.50 | 338.34 |
| Enugu | Uzo-Uwani | 0.00 | 7.50 | 231.05 |
| Gombe | Akko | 7.00 | 22.50 | 294.80 |
| Gombe | Balanga | 0.00 | 21.00 | 194.20 |
| Gombe | Billiri | 5.00 | 22.50 | 268.95 |
| Gombe | Dukku | 14.00 | 24.00 | 278.71 |
| Gombe | Funakaye | 1.00 | 25.50 | 244.58 |
| Gombe | Gombe | 4.50 | 24.00 | 305.44 |
| Gombe | Kaltungo | 0.00 | 22.50 | 236.68 |
| Gombe | Kwami | 3.00 | 25.50 | 281.21 |
| Gombe | Nafada | 4.50 | 24.00 | 227.08 |
| Gombe | Shomgom | 5.00 | 21.00 | 247.74 |
| Gombe | Yamaltu/Deba | 0.00 | 24.00 | 252.37 |
| Imo | Aboh-Mbaise | 0.00 | 1.50 | 186.51 |
| Imo | Ahiazu-Mbaise | 0.00 | 1.50 | 192.54 |
| Imo | Ehime-Mbano | 0.00 | 1.50 | 191.23 |
| Imo | Ezinihitte Mbaise | 0.00 | 1.50 | 186.00 |
| Imo | Ideato North | 0.00 | 1.50 | 203.11 |
| Imo | Ideato South | 0.00 | 1.50 | 182.38 |
| Imo | Ihitte/Uboma | 0.00 | 1.50 | 188.22 |
| Imo | Ikeduru | 0.00 | 0.00 | 180.97 |
| Imo | Isiala Mbano | 0.00 | 0.00 | 177.94 |
| Imo | Isu | 0.00 | 0.00 | 193.50 |
| Imo | Mbatoli | 0.00 | 0.00 | 188.17 |
| Imo | Ngor-Okpala | 0.00 | 0.00 | 183.26 |
| Imo | Njaba | 0.00 | 0.00 | 194.75 |
| Imo | Nkwerre | 0.00 | 1.50 | 191.81 |
| Imo | Nwangele | 0.00 | 0.00 | 187.39 |
| Imo | Obowo | 0.00 | 3.00 | 180.97 |
| Imo | Oguta | 0.00 | 1.50 | 224.61 |
| Imo | Ohaji /Egbema | 0.00 | 0.00 | 214.56 |
| Imo | Okigwe | 0.00 | 1.50 | 217.46 |
| Imo | Orlu | 0.00 | 1.50 | 231.87 |
| Imo | Orsu | 0.00 | 3.00 | 197.53 |
| Imo | Oru East | 0.00 | 0.00 | 195.05 |

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|--------|------------------|--------|-------|--------|
| Imo | Oru West | 0.00 | 0.00 | 214.04 |
| Imo | Owerri Municipal | 0.00 | 0.00 | 435.47 |
| Imo | Owerri North | 0.00 | 0.00 | 249.00 |
| Imo | Owerri West | 0.00 | 0.00 | 281.33 |
| Imo | Unuimo | 0.00 | 1.50 | 172.96 |
| Jigawa | Auyo | 81.00 | 9.00 | 245.41 |
| Jigawa | Babura | 105.50 | 18.00 | 199.47 |
| Jigawa | Biriniwa | 85.00 | 9.00 | 300.18 |
| Jigawa | Birnin Kudu | 12.00 | 13.50 | 51.61 |
| Jigawa | Buji | 26.50 | 13.50 | 176.77 |
| Jigawa | Dutse | 15.00 | 7.50 | 144.30 |
| Jigawa | Gagarawa | 85.00 | 9.00 | 306.43 |
| Jigawa | Garki | 78.00 | 13.50 | 223.59 |
| Jigawa | Gumel | 83.00 | 12.00 | 303.50 |
| Jigawa | Guri | 63.50 | 9.00 | 262.16 |
| Jigawa | Gwaram | 0.00 | 18.00 | 109.72 |
| Jigawa | Gwiwa | 13.50 | 16.50 | 271.22 |
| Jigawa | Hadejia | 76.50 | 9.00 | 243.56 |
| Jigawa | Jahun | 84.00 | 7.50 | 159.35 |
| Jigawa | Kafin Hausa | 84.00 | 7.50 | 210.35 |
| Jigawa | Kaugama | 79.50 | 9.00 | 274.14 |
| Jigawa | Kazaure | 26.50 | 19.50 | 238.16 |
| Jigawa | Kiri Kasamma | 68.50 | 9.00 | 268.69 |
| Jigawa | Kiyawa | 41.00 | 7.50 | 175.84 |
| Jigawa | Maigatari | 84.50 | 12.00 | 290.25 |
| Jigawa | Malam Maduri | 74.00 | 7.50 | 274.40 |
| Jigawa | Miga | 92.00 | 7.50 | 231.79 |
| Jigawa | Ringim | 5.50 | 7.50 | 157.25 |
| Jigawa | Roni | 0.00 | 19.50 | 257.04 |
| Jigawa | Sule Tankarkar | 95.50 | 15.00 | 243.47 |
| Jigawa | Taura | 94.50 | 7.50 | 209.38 |
| Jigawa | Yankwashi | 13.50 | 19.50 | 273.08 |
| Kaduna | Birnin Gwari | 55.50 | 18.00 | 162.83 |
| Kaduna | Chikun | 18.50 | 18.00 | 173.16 |
| Kaduna | Giwa | 0.00 | 16.50 | 106.79 |
| Kaduna | Igabi | 9.00 | 19.50 | 137.35 |
| Kaduna | Ikara | 7.00 | 16.50 | 104.01 |
| Kaduna | Jaba | 52.50 | 18.00 | 133.46 |
| Kaduna | Jema'a | 61.00 | 16.50 | 138.60 |
| Kaduna | Kachia | 12.50 | 18.00 | 114.88 |
| Kaduna | Kaduna North | 10.50 | 19.50 | 151.04 |
| Kaduna | Kaduna South | 22.00 | 19.50 | 167.68 |
| Kaduna | Kagarko | 0.00 | 18.00 | 117.96 |
| Kaduna | Kajuru | 0.00 | 19.50 | 132.04 |
| Kaduna | Kaura | 0.00 | 19.50 | 121.98 |
| Kaduna | Kauru | 3.00 | 21.00 | 110.33 |
| Kaduna | Kubau | 13.00 | 19.50 | 114.09 |
| Kaduna | Kudan | 0.00 | 16.50 | 92.97 |
| Kaduna | Lere | 0.00 | 22.50 | 102.24 |
| Kaduna | Makarfi | 0.00 | 18.00 | 100.79 |
| Kaduna | Sabon Gari | 0.00 | 16.50 | 88.22 |
| Kaduna | Sanga | 1.00 | 18.00 | 125.70 |
| Kaduna | Soba | 0.00 | 21.00 | 111.24 |

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|---------|----------------|-------|-------|--------|
| Kaduna | Zangon Kataf | 27.50 | 19.50 | 108.83 |
| Kaduna | Zaria | 0.00 | 18.00 | 102.20 |
| Kano | Ajingi | 1.00 | 9.00 | 169.37 |
| Kano | Albasu | 9.50 | 13.50 | 124.24 |
| Kano | Bagwai | 0.00 | 19.50 | 150.27 |
| Kano | Bebeji | 6.50 | 27.00 | 88.73 |
| Kano | Bichi | 3.00 | 19.50 | 123.83 |
| Kano | Bunkure | 0.00 | 24.00 | 144.22 |
| Kano | Dala | 0.00 | 24.00 | 50.00 |
| Kano | Dambatta | 24.50 | 16.50 | 189.44 |
| Kano | Dawakin Kudu | 0.00 | 21.00 | 94.87 |
| Kano | Dawakin Tofa | 0.00 | 22.50 | 117.87 |
| Kano | Doguwa | 0.00 | 42.00 | 300.05 |
| Kano | Fagge | 0.00 | 21.00 | 182.50 |
| Kano | Gabasawa | 0.00 | 10.50 | 150.97 |
| Kano | Garko | 0.00 | 22.50 | 108.55 |
| Kano | Garum Mallam | 5.00 | 22.50 | 156.62 |
| Kano | Gaya | 1.00 | 12.00 | 125.25 |
| Kano | Gezawa | 0.00 | 15.00 | 124.56 |
| Kano | Gwale | 0.00 | 24.00 | 107.63 |
| Kano | Gwarzo | 0.00 | 24.00 | 104.45 |
| Kano | Kabo | 0.00 | 21.00 | 126.35 |
| Kano | Kano Municipal | 0.00 | 24.00 | 58.72 |
| Kano | Karaye | 0.00 | 25.50 | 177.12 |
| Kano | Kibiya | 0.50 | 27.00 | 133.39 |
| Kano | Kiru | 0.00 | 27.00 | 91.59 |
| Kano | Kumbotso | 0.00 | 25.50 | 96.76 |
| Kano | Kunchi | 13.00 | 18.00 | 229.20 |
| Kano | Kura | 0.00 | 24.00 | 194.73 |
| Kano | Madobi | 0.00 | 24.00 | 129.26 |
| Kano | Makoda | 0.00 | 18.00 | 235.47 |
| Kano | Minjibir | 9.00 | 18.00 | 168.33 |
| Kano | Nassarawa | 0.00 | 64.50 | 322.72 |
| Kano | Rano | 15.50 | 27.00 | 122.37 |
| Kano | Rimin Gado | 0.00 | 24.00 | 149.14 |
| Kano | Rogo | 4.00 | 31.50 | 66.05 |
| Kano | Shanono | 0.00 | 22.50 | 145.90 |
| Kano | Sumaila | 17.00 | 27.00 | 103.26 |
| Kano | Takai | 0.00 | 15.00 | 93.30 |
| Kano | Tarauni | 0.00 | 24.00 | 159.46 |
| Kano | Tofa | 0.00 | 22.50 | 151.19 |
| Kano | Tsanyawa | 0.00 | 18.00 | 178.01 |
| Kano | Tundun Wada | 20.00 | 30.00 | 190.74 |
| Kano | Ungogo | 0.00 | 22.50 | 118.17 |
| Kano | Warawa | 0.00 | 18.00 | 160.03 |
| Kano | Wudil | 0.00 | 18.00 | 123.82 |
| Katsina | Bakori | 0.00 | 37.50 | 61.29 |
| Katsina | Batagarawa | 0.50 | 10.50 | 227.97 |
| Katsina | Batsari | 0.00 | 7.50 | 175.93 |
| Katsina | Baure | 89.50 | 21.00 | 266.89 |
| Katsina | Bindawa | 20.50 | 12.00 | 181.59 |
| Katsina | Charanchi | 8.50 | 10.50 | 206.64 |
| Katsina | Dandume | 0.00 | 48.00 | 116.82 |

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|---------|--------------|-------|-------|--------|
| Katsina | Danja | 0.00 | 40.50 | 90.62 |
| Katsina | Danmusa | 0.00 | 16.50 | 172.43 |
| Katsina | Daura | 30.00 | 16.50 | 322.20 |
| Katsina | Dutsi | 12.50 | 16.50 | 304.37 |
| Katsina | Dutsinma | 0.00 | 13.50 | 192.18 |
| Katsina | Faskari | 0.00 | 37.50 | 103.55 |
| Katsina | Funtua | 0.00 | 45.00 | 66.68 |
| Katsina | Ingawa | 1.50 | 18.00 | 200.91 |
| Katsina | Jibia | 0.00 | 10.50 | 219.48 |
| Katsina | Kafur | 0.00 | 31.50 | 70.33 |
| Katsina | Kaita | 28.00 | 15.00 | 260.93 |
| Katsina | Kankara | 0.00 | 24.00 | 93.71 |
| Katsina | Kankia | 9.50 | 13.50 | 171.39 |
| Katsina | Katsina | 72.50 | 10.50 | 149.42 |
| Katsina | Kurfi | 0.00 | 10.50 | 218.70 |
| Katsina | Kusada | 0.00 | 13.50 | 207.85 |
| Katsina | Mai'Adua | 21.50 | 16.50 | 272.43 |
| Katsina | Malumfashi | 0.00 | 30.00 | 68.65 |
| Katsina | Mani | 9.00 | 16.50 | 234.48 |
| Katsina | Mashi | 4.50 | 16.50 | 271.72 |
| Katsina | Matazu | 0.00 | 16.50 | 181.85 |
| Katsina | Musawa | 0.00 | 21.00 | 146.40 |
| Katsina | Rimi | 22.50 | 12.00 | 218.20 |
| Katsina | Sabuwa | 0.00 | 46.50 | 159.92 |
| Katsina | Safana | 0.00 | 9.00 | 156.96 |
| Katsina | Sandamu | 7.50 | 16.50 | 301.00 |
| Katsina | Zango | 28.00 | 21.00 | 234.12 |
| Kebbi | Aleiro | 0.00 | 30.00 | 209.23 |
| Kebbi | Arewa Dandi | 0.00 | 16.50 | 197.52 |
| Kebbi | Argungu | 31.00 | 21.00 | 178.91 |
| Kebbi | Augie | 17.00 | 6.00 | 214.98 |
| Kebbi | Bagudo | 0.00 | 33.00 | 345.07 |
| Kebbi | Birnin-Kebbi | 34.50 | 31.50 | 136.84 |
| Kebbi | Bunza | 17.50 | 30.00 | 168.34 |
| Kebbi | Dandi | 0.00 | 28.50 | 191.87 |
| Kebbi | Danko Wasagu | 0.00 | 33.00 | 254.85 |
| Kebbi | Fakai | 0.00 | 28.50 | 285.05 |
| Kebbi | Gwandu | 0.00 | 22.50 | 164.90 |
| Kebbi | Jega | 0.00 | 31.50 | 150.72 |
| Kebbi | Kalgo | 3.00 | 31.50 | 192.98 |
| Kebbi | Koko/Besse | 0.00 | 33.00 | 129.00 |
| Kebbi | Maiyama | 0.00 | 31.50 | 162.03 |
| Kebbi | Ngaski | 0.00 | 43.50 | 333.57 |
| Kebbi | Sakaba | 0.00 | 40.50 | 214.92 |
| Kebbi | Shanga | 0.00 | 33.00 | 295.61 |
| Kebbi | Suru | 0.00 | 31.50 | 168.31 |
| Kebbi | Yauri | 0.00 | 34.50 | 311.80 |
| Kebbi | Zuru | 0.00 | 28.50 | 157.18 |
| Kogi | Adavi | 9.50 | 27.00 | 249.42 |
| Kogi | Ajaokuta | 3.50 | 24.00 | 257.18 |
| Kogi | Ankpa | 23.50 | 22.50 | 306.32 |
| Kogi | Bassa | 60.00 | 21.00 | 279.57 |
| Kogi | Dekina | 49.50 | 25.50 | 283.36 |

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|-----------|-------------------|-------|-------|--------|
| Kogi | Ibaji | 0.00 | 22.50 | 266.89 |
| Kogi | Idah | 0.00 | 22.50 | 263.40 |
| Kogi | Igalamela-Odolu | 0.00 | 22.50 | 277.94 |
| Kogi | Ijumu | 0.00 | 22.50 | 228.26 |
| Kogi | Kabba /Bunu | 26.00 | 22.50 | 235.75 |
| Kogi | Koton-Karfe | 76.00 | 19.50 | 269.38 |
| Kogi | Lokoja | 48.00 | 22.50 | 251.13 |
| Kogi | Mopa-Muro | 27.00 | 21.00 | 225.50 |
| Kogi | Ofu | 12.00 | 22.50 | 280.07 |
| Kogi | Ogori/ Magongo | 0.00 | 21.00 | 238.46 |
| Kogi | Okehi | 0.00 | 24.00 | 243.44 |
| Kogi | Okene | 0.00 | 34.50 | 247.64 |
| Kogi | Olamaboro | 0.50 | 21.00 | 302.43 |
| Kogi | Omala | 0.00 | 19.50 | 301.87 |
| Kogi | Yagba East | 27.50 | 22.50 | 215.97 |
| Kogi | Yagba West | 24.00 | 22.50 | 207.80 |
| Kwara | Asa | 6.00 | 21.00 | 158.76 |
| Kwara | Baruten | 36.00 | 31.50 | 105.59 |
| Kwara | Edu | 20.00 | 22.50 | 194.55 |
| Kwara | Ekiti | 0.00 | 22.50 | 201.19 |
| Kwara | Ifelodun | 10.50 | 25.50 | 185.96 |
| Kwara | Ilorin East | 3.50 | 27.00 | 174.17 |
| Kwara | Ilorin South | 0.00 | 22.50 | 169.76 |
| Kwara | Ilorin West | 7.50 | 25.50 | 164.62 |
| Kwara | Irepodun | 0.00 | 24.00 | 178.13 |
| Kwara | Isin | 8.50 | 18.00 | 187.52 |
| Kwara | Kaiama | 19.50 | 19.50 | 151.57 |
| Kwara | Moro | 11.00 | 21.00 | 163.31 |
| Kwara | Offa | 0.00 | 19.50 | 170.45 |
| Kwara | Oke-Ero | 5.50 | 22.50 | 196.64 |
| Kwara | Oyun | 0.00 | 21.00 | 168.23 |
| Kwara | Pategi | 23.50 | 18.00 | 223.27 |
| Lagos | Agege | 7.50 | 58.50 | 106.53 |
| Lagos | Ajeromi/ Ifelodun | 14.00 | 24.00 | 107.27 |
| Lagos | Alimosho | 7.00 | 55.50 | 103.50 |
| Lagos | Amuwo Odofin | 13.00 | 46.50 | 105.03 |
| Lagos | Apapa | 12.50 | 45.00 | 109.03 |
| Lagos | Badagry | 47.50 | 37.50 | 87.87 |
| Lagos | Epe | 0.00 | 42.00 | 137.33 |
| Lagos | Eti-Osa | 6.00 | 43.50 | 116.63 |
| Lagos | Ibeju Lekki | 0.00 | 37.50 | 135.24 |
| Lagos | Ifako/Ijaye | 0.50 | 55.50 | 106.22 |
| Lagos | Ikeja | 5.00 | 46.50 | 107.47 |
| Lagos | Ikorodu | 0.00 | 45.00 | 118.33 |
| Lagos | Kosofe | 3.50 | 55.50 | 110.75 |
| Lagos | Lagos Island | 4.50 | 45.00 | 115.16 |
| Lagos | Lagos Mainland | 7.50 | 51.00 | 109.50 |
| Lagos | Mushin | 7.50 | 66.00 | 107.78 |
| Lagos | Ojo | 12.50 | 48.00 | 98.52 |
| Lagos | Oshodi/Isolo | 7.50 | 58.50 | 106.53 |
| Lagos | Shomolu | 7.50 | 55.50 | 109.77 |
| Lagos | Surulere | 50.00 | 45.00 | 107.73 |
| Nassarawa | Akwanga | 35.00 | 18.00 | 129.64 |

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|-----------|------------------|-------|-------|--------|
| Nassarawa | Awe | 0.00 | 16.50 | 232.15 |
| Nassarawa | Doma | 0.00 | 16.50 | 197.89 |
| Nassarawa | Karu | 16.00 | 16.50 | 171.78 |
| Nassarawa | Keana | 0.00 | 16.50 | 218.43 |
| Nassarawa | Keffi | 21.00 | 16.50 | 163.80 |
| Nassarawa | Kokona | 67.00 | 16.50 | 155.03 |
| Nassarawa | Lafia | 74.50 | 18.00 | 169.46 |
| Nassarawa | Nassarawa | 50.00 | 18.00 | 220.44 |
| Nassarawa | Nassarawa Egon | 45.00 | 15.00 | 130.58 |
| Nassarawa | Obi | 0.00 | 19.50 | 218.32 |
| Nassarawa | Toto | 23.50 | 21.00 | 202.35 |
| Nassarawa | Wamba | 0.00 | 18.00 | 132.11 |
| Niger | Agai | 0.00 | 11.59 | 143.03 |
| Niger | Agwara | 0.00 | 20.95 | 262.28 |
| Niger | Bida | 0.00 | 8.57 | 102.93 |
| Niger | Borgu | 0.00 | 18.63 | 194.13 |
| Niger | Bosso | 0.00 | 10.73 | 160.38 |
| Niger | Chanchaga | 0.00 | 10.67 | 166.67 |
| Niger | Edati | 0.00 | 12.55 | 133.94 |
| Niger | Gbako | 0.00 | 10.35 | 133.99 |
| Niger | Gurara | 0.00 | 7.13 | 117.32 |
| Niger | Katcha | 0.00 | 9.15 | 138.07 |
| Niger | Kontagora | 0.00 | 15.90 | 170.67 |
| Niger | Lapai | 0.00 | 13.84 | 129.96 |
| Niger | Lavun | 0.00 | 12.74 | 154.28 |
| Niger | Magama | 0.00 | 17.73 | 211.41 |
| Niger | Mariga | 0.00 | 16.88 | 181.61 |
| Niger | Mashegu | 0.00 | 15.22 | 162.27 |
| Niger | Mokwa | 0.00 | 16.15 | 153.73 |
| Niger | Muya | 0.00 | 7.20 | 149.83 |
| Niger | Paikoro | 0.00 | 6.72 | 125.10 |
| Niger | Rafi | 0.00 | 10.94 | 188.48 |
| Niger | Rijau | 0.00 | 18.54 | 245.12 |
| Niger | Shiroro | 0.00 | 10.69 | 189.03 |
| Niger | Suleja | 0.00 | 7.70 | 119.62 |
| Niger | Tafa | 0.00 | 5.94 | 108.65 |
| Niger | Wushishi | 0.00 | 12.66 | 163.90 |
| Ogun | Abeokuta North | 64.00 | 40.50 | 100.42 |
| Ogun | Abeokuta South | 22.00 | 51.00 | 108.59 |
| Ogun | Ado Odo/Ota | 39.00 | 46.50 | 95.09 |
| Ogun | Egbado North | 66.50 | 43.50 | 88.40 |
| Ogun | Egbado South | 53.50 | 40.50 | 89.42 |
| Ogun | Ewekoro | 38.00 | 36.00 | 101.79 |
| Ogun | Ifo | 0.00 | 19.50 | 106.50 |
| Ogun | Ijebu East | 0.00 | 39.00 | 150.35 |
| Ogun | Ijebu North | 0.00 | 45.00 | 137.16 |
| Ogun | Ijebu North-East | 0.00 | 37.50 | 138.88 |
| Ogun | Ijebu-Ode | 0.00 | 36.00 | 135.77 |
| Ogun | Ikenne | 0.00 | 39.00 | 123.22 |
| Ogun | Imeko-Afon | 74.00 | 34.50 | 87.45 |
| Ogun | Ipokia | 58.50 | 37.50 | 83.73 |
| Ogun | Obafemi-Owode | 3.50 | 40.50 | 116.41 |
| Ogun | Odeda | 33.00 | 39.00 | 114.35 |

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|------|-------------------|-------|-------|--------|
| Ogun | Odogbolu | 0.00 | 46.50 | 129.48 |
| Ogun | Ogun Waterside | 0.00 | 36.00 | 155.55 |
| Ogun | Remo-North | 0.00 | 36.00 | 125.09 |
| Ogun | Shagamu | 0.00 | 43.50 | 118.13 |
| Ondo | Akoko North-East | 0.00 | 24.00 | 227.69 |
| Ondo | Akoko North-West | 0.00 | 25.50 | 219.97 |
| Ondo | Akoko South-East | 0.00 | 21.00 | 225.91 |
| Ondo | Akoko South-West | 0.00 | 25.50 | 215.06 |
| Ondo | Akure North | 0.00 | 27.00 | 199.45 |
| Ondo | Akure South | 0.00 | 39.00 | 191.43 |
| Ondo | Ese-Odo | 0.00 | 36.00 | 183.48 |
| Ondo | Idanre | 0.00 | 30.00 | 196.99 |
| Ondo | Ifedore | 0.00 | 28.50 | 188.37 |
| Ondo | Ilaje | 0.00 | 40.50 | 173.07 |
| Ondo | Ile-Oluji/Okeigbo | 0.00 | 30.00 | 182.41 |
| Ondo | Irele | 0.00 | 31.50 | 183.37 |
| Ondo | Odigbo | 0.00 | 37.50 | 171.25 |
| Ondo | Okitipupa | 0.00 | 36.00 | 171.89 |
| Ondo | Ondo East | 0.00 | 37.50 | 182.08 |
| Ondo | Ondo West | 0.00 | 30.00 | 172.13 |
| Ondo | Ose | 0.00 | 25.50 | 218.52 |
| Ondo | Owo | 0.00 | 31.50 | 210.31 |
| Osun | Aiyedaade | 0.00 | 37.50 | 152.52 |
| Osun | Aiyedire | 20.50 | 34.50 | 149.64 |
| Osun | Atakumosa East | 0.00 | 27.00 | 174.98 |
| Osun | Atakumosa West | 0.00 | 30.00 | 168.67 |
| Osun | Boluwaduro | 0.00 | 21.00 | 175.50 |
| Osun | Boripe | 8.50 | 24.00 | 169.68 |
| Osun | Ede North | 0.00 | 28.50 | 161.75 |
| Osun | Ede South | 16.00 | 31.50 | 160.16 |
| Osun | Egbedore | 6.50 | 28.50 | 158.96 |
| Osun | Ejigbo | 19.50 | 27.00 | 152.88 |
| Osun | Ife Central | 0.00 | 34.50 | 166.53 |
| Osun | Ife East | 2.50 | 37.50 | 166.67 |
| Osun | Ife North | 0.00 | 39.00 | 160.36 |
| Osun | Ife South | 0.00 | 36.00 | 165.73 |
| Osun | Ifedayo | 4.00 | 22.50 | 184.34 |
| Osun | Ifelodun | 56.50 | 22.50 | 168.24 |
| Osun | Ila | 8.50 | 22.50 | 179.96 |
| Osun | Ilesha East | 0.00 | 27.00 | 173.66 |
| Osun | Ilesha West | 0.00 | 25.50 | 171.38 |
| Osun | Irepodun | 10.50 | 24.00 | 162.03 |
| Osun | Irewole | 6.00 | 36.00 | 148.73 |
| Osun | Isokan | 5.50 | 37.50 | 147.44 |
| Osun | Iwo | 25.50 | 34.50 | 145.16 |
| Osun | Obokun | 0.50 | 24.00 | 173.78 |
| Osun | Odo-Otin | 8.00 | 22.50 | 169.81 |
| Osun | Ola-Oluwa | 18.00 | 27.00 | 147.40 |
| Osun | Olorunda | 0.50 | 27.00 | 164.86 |
| Osun | Oriade | 0.00 | 27.00 | 179.01 |
| Osun | Orolu | 14.50 | 22.50 | 160.55 |
| Osun | Osogbo | 0.00 | 25.50 | 165.20 |
| Oyo | Afijio | 34.50 | 49.50 | 133.16 |

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|---------|-------------------|-------|-------|--------|
| Oyo | Akinyele | 39.00 | 39.00 | 134.73 |
| Oyo | Atiba | 36.50 | 28.50 | 133.94 |
| Oyo | Atisbo | 75.00 | 33.00 | 104.00 |
| Oyo | Egbeda | 8.50 | 39.00 | 140.30 |
| Oyo | Ibadan North | 19.00 | 51.00 | 134.31 |
| Oyo | Ibadan North-East | 29.00 | 51.00 | 135.01 |
| Oyo | Ibadan North-West | 20.00 | 43.50 | 132.87 |
| Oyo | Ibadan South-East | 3.50 | 45.00 | 134.01 |
| Oyo | Ibadan South-West | 8.50 | 49.50 | 132.22 |
| Oyo | Ibarapa Central | 70.50 | 36.00 | 102.57 |
| Oyo | Ibarapa East | 57.50 | 33.00 | 115.89 |
| Oyo | Ibarapa North | 41.00 | 33.00 | 99.72 |
| Oyo | Ido | 42.50 | 33.00 | 123.99 |
| Oyo | Irepo | 24.00 | 27.00 | 136.79 |
| Oyo | Iseyin | 50.50 | 34.50 | 115.44 |
| Oyo | Itesiwaju | 46.50 | 33.00 | 112.91 |
| Oyo | Iwajowa | 51.00 | 33.00 | 93.70 |
| Oyo | Kajola | 56.50 | 34.50 | 108.93 |
| Oyo | Lagelu | 25.50 | 37.50 | 140.05 |
| Oyo | Ogbomosho North | 9.50 | 33.00 | 150.31 |
| Oyo | Ogbomosho South | 11.00 | 30.00 | 149.52 |
| Oyo | Ogo Oluwa | 17.50 | 25.50 | 150.01 |
| Oyo | Olorunsogo | 24.00 | 25.50 | 143.71 |
| Oyo | Oluyole | 12.00 | 39.00 | 132.10 |
| Oyo | Ona Ara | 12.50 | 40.50 | 139.65 |
| Oyo | Orelope | 37.50 | 30.00 | 129.12 |
| Oyo | Ori-Ire | 23.00 | 30.00 | 145.91 |
| Oyo | Oyo East | 24.50 | 36.00 | 138.75 |
| Oyo | Oyo West | 35.00 | 33.00 | 130.66 |
| Oyo | Saki East | 39.00 | 28.50 | 120.02 |
| Oyo | Saki West | 62.00 | 34.50 | 96.75 |
| Oyo | Surulere | 2.50 | 3.00 | 158.00 |
| Plateau | Barkin Ladi | 0.00 | 8.34 | 123.97 |
| Plateau | Bassa | 0.00 | 14.51 | 232.04 |
| Plateau | Bokkos | 0.00 | 6.86 | 140.42 |
| Plateau | Jos East | 0.00 | 10.31 | 128.49 |
| Plateau | Jos North | 0.00 | 11.38 | 112.00 |
| Plateau | Jos South | 0.00 | 10.51 | 115.26 |
| Plateau | Kanam | 0.00 | 4.31 | 164.99 |
| Plateau | Kanke | 0.00 | 6.70 | 163.55 |
| Plateau | Langtang North | 0.00 | 5.00 | 193.62 |
| Plateau | Langtang South | 0.00 | 6.73 | 220.90 |
| Plateau | Mangu | 0.00 | 10.01 | 143.51 |
| Plateau | Mikang | 0.00 | 6.90 | 182.35 |
| Plateau | Pankshin | 0.00 | 9.58 | 165.34 |
| Plateau | Qua'an Pan | 0.00 | 5.11 | 180.29 |
| Plateau | Riyom | 0.00 | 8.70 | 112.13 |
| Plateau | Shendam | 0.00 | 6.64 | 208.25 |
| Plateau | Wase | 0.00 | 4.68 | 172.16 |
| Rivers | Abua /Oduval | 0.00 | 3.00 | 194.32 |
| Rivers | Ahoada East | 0.00 | 1.50 | 208.56 |
| Rivers | Ahoada West | 0.00 | 1.50 | 193.63 |
| Rivers | Akuku-Toru | 0.00 | 3.00 | 258.67 |

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|--------|---------------|-------|-------|--------|
| Rivers | Andoni | 0.00 | 6.00 | 293.11 |
| Rivers | Asari-Toru | 0.00 | 3.00 | 331.83 |
| Rivers | Bonny | 0.00 | 4.50 | 311.06 |
| Rivers | Degema | 0.00 | 3.00 | 276.00 |
| Rivers | Eleme | 0.00 | 3.00 | 240.68 |
| Rivers | Emuoha | 0.00 | 3.00 | 202.09 |
| Rivers | Etche | 0.00 | 1.50 | 193.82 |
| Rivers | Gokana | 0.00 | 4.50 | 261.75 |
| Rivers | Ikwerre | 0.00 | 3.00 | 220.70 |
| Rivers | Khana | 0.00 | 4.50 | 211.51 |
| Rivers | Obio/Akpor | 0.00 | 0.00 | 386.02 |
| | Ogba/ Egbema/ | | | |
| Rivers | Ndoni | 0.00 | 1.50 | 283.46 |
| Rivers | Ogu /Bolo | 0.00 | 4.50 | 207.88 |
| Rivers | Okrika | 0.00 | 3.00 | 318.33 |
| Rivers | Omumma | 0.00 | 1.50 | 178.82 |
| Rivers | Opobo /Nkoro | 0.00 | 6.00 | 256.47 |
| Rivers | Oyigbo | 0.00 | 3.00 | 239.78 |
| Rivers | Port Harcourt | 0.00 | 3.00 | 496.47 |
| Rivers | Tai | 0.00 | 4.50 | 217.09 |
| Sokoto | Binji | 0.00 | 6.00 | 298.08 |
| Sokoto | Bodinga | 0.00 | 7.50 | 180.17 |
| Sokoto | Dange-Shuni | 0.00 | 6.00 | 192.84 |
| Sokoto | Gada | 0.00 | 6.00 | 278.47 |
| Sokoto | Goronyo | 0.00 | 6.00 | 313.30 |
| Sokoto | Gudu | 0.00 | 6.00 | 312.04 |
| Sokoto | Gwadabawa | 0.00 | 6.00 | 251.09 |
| Sokoto | Illela | 0.00 | 6.00 | 297.98 |
| Sokoto | Isa | 0.00 | 6.00 | 270.42 |
| Sokoto | Kebbe | 0.00 | 27.00 | 298.43 |
| Sokoto | Kware | 18.50 | 7.50 | 238.85 |
| Sokoto | Rabah | 0.00 | 7.50 | 259.82 |
| Sokoto | Sabon Birni | 0.00 | 6.00 | 246.04 |
| Sokoto | Shagari | 0.00 | 13.50 | 233.71 |
| Sokoto | Silame | 0.00 | 4.50 | 239.87 |
| Sokoto | Sokoto North | 0.00 | 7.50 | 195.87 |
| Sokoto | Sokoto South | 0.00 | 7.50 | 157.12 |
| Sokoto | Tambuwal | 0.00 | 19.50 | 188.36 |
| Sokoto | Tangaza | 0.00 | 6.00 | 353.16 |
| Sokoto | Tureta | 0.00 | 10.50 | 300.71 |
| Sokoto | Wamako | 0.00 | 6.00 | 229.87 |
| Sokoto | Wurno | 0.00 | 7.50 | 277.49 |
| Sokoto | Yabo | 0.00 | 9.00 | 216.07 |
| Taraba | Ardo-Kola | 3.50 | 13.50 | 166.05 |
| Taraba | Bali | 7.50 | 12.00 | 141.87 |
| Taraba | Donga | 27.00 | 12.00 | 239.78 |
| Taraba | Gashaka | 1.00 | 10.50 | 77.56 |
| Taraba | Gassol | 21.00 | 12.00 | 178.84 |
| Taraba | Ibi | 38.50 | 16.50 | 280.00 |
| Taraba | Jalingo | 0.00 | 15.00 | 174.65 |
| Taraba | Karim Lamido | 11.00 | 18.00 | 212.20 |
| Taraba | Kurmi | 20.00 | 10.50 | 184.42 |
| Taraba | Lau | 0.00 | 16.50 | 186.22 |
| Taraba | Sardauna | 4.00 | 7.50 | 67.66 |

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|---------|---------------------|-------|-------|--------|
| Taraba | Takum | 33.50 | 12.00 | 286.43 |
| Taraba | Ussa | 36.00 | 12.00 | 308.17 |
| Taraba | Wukari | 41.50 | 13.50 | 318.89 |
| Taraba | Yorro | 0.00 | 15.00 | 177.76 |
| Taraba | Zing | 0.00 | 15.00 | 181.47 |
| Yobe | Bade | 25.50 | 31.50 | 216.87 |
| Yobe | Borsari | 0.50 | 33.00 | 194.62 |
| Yobe | Damaturu | 0.00 | 30.00 | 233.49 |
| Yobe | Fika | 4.00 | 25.50 | 226.93 |
| Yobe | Fune | 0.00 | 28.50 | 236.49 |
| Yobe | Geidam | 0.00 | 33.00 | 151.58 |
| Yobe | Gujba | 0.00 | 28.50 | 206.79 |
| Yobe | Gulani | 0.00 | 27.00 | 194.17 |
| Yobe | Jakusko | 14.00 | 30.00 | 208.11 |
| Yobe | Karasuwa | 25.50 | 31.50 | 189.88 |
| Yobe | Machina | 51.00 | 33.00 | 252.51 |
| Yobe | Nangere | 10.00 | 25.50 | 235.00 |
| Yobe | Nguru | 36.00 | 30.00 | 197.72 |
| Yobe | Potiskum | 5.50 | 25.50 | 241.45 |
| Yobe | Tarmuwa | 0.00 | 31.50 | 211.38 |
| Yobe | Yunusari | 0.00 | 33.00 | 132.03 |
| Yobe | Yusufari | 15.50 | 31.50 | 179.23 |
| Zamfara | Anka | 19.00 | 24.00 | 231.36 |
| Zamfara | Bakura | 0.00 | 7.50 | 245.36 |
| Zamfara | Birnin-Magaji/Kiyaw | 0.00 | 13.50 | 172.24 |
| Zamfara | Bukkuyum | 2.00 | 19.50 | 193.59 |
| Zamfara | Bungudu | 0.00 | 22.50 | 68.47 |
| Zamfara | Gummi | 0.00 | 18.00 | 207.25 |
| Zamfara | Gusau | 0.00 | 30.00 | 78.33 |
| Zamfara | Kaura Namoda | 0.00 | 16.50 | 144.10 |
| Zamfara | Maradun | 15.00 | 6.00 | 230.67 |
| Zamfara | Maru | 0.00 | 37.50 | 181.37 |
| Zamfara | Shinkafi | 0.00 | 4.50 | 232.80 |
| Zamfara | Talata-Mafara | 20.50 | 15.00 | 141.69 |
| Zamfara | Tsafe | 0.00 | 30.00 | 76.86 |
| Zamfara | Zurmi | 0.00 | 4.50 | 165.77 |