ANAYSIS OF POVERTY DEPRIVATION AND MAPPING IN ZARIA URBAN AREA POVERTY

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ABSTRACT
The study analysed and mapped poverty in Zaria Urban Area, this has enabled the isolation of neighbourhood's socio-spatial needs. Data for the study were source from both primary and secondary sources. The primary data was obtained through general household survey by administration of questionnaires and personal interviews. The approach to the analysis used was the use absolute and relative measurement of poverty. The absolute measure that was adopted is the Head Count Ratio and the used is the Fuzzy Set Technique. Scores obtained from the analysis were used to rank districts according to poverty levels. The findings of the study show that poverty varies by districts in Zaria Urban Area. By general ranking, aggregates were used to exhibit which District has minimal poverty level relative to other Districts, Which has better economic social and access to infrastructure. The data obtained was dis-aggregated by each indicator across districts. This objective is to show ranking and also permit the identification of specific interventions for the 6 Districts. Based on the results obtained, specific and general will be recommendations were made.
Key Words: Multi-dimensional poverty Analysis, disaggregating poverty, Urban spatial Level

INTRODUCTION
Poverty is defined as the human condition characterized by the sustained or chronic deprivation of the resources, capabilities, choices, security and power necessary for the enjoyment of an adequate standard of living and other civil, cultural, economic, political and social rights (Lorenzo G. B. (2005). Poverty is a common plague afflicting people all over the world especially in the less developed countries. The factors that influence poverty are high inflation rate, unemployment, bad economic policies, huge wastage of scarce resources and bad governance. The problem of poverty in Nigeria has not only become entrenched and multifaceted over the years, but has defied efforts at eradication. The Millennium Development Goals (MDGs) brought poverty unto the global agenda and stimulated a new commitment by all

nations to the battle against poverty. Over past decades, city managers and activists have faced an urgency to respond to the plight of the urban poor. Rapid urbanization places enormous pressure on cities to use their limited resources to meet or facilitate the increased demand for water, sanitation, electricity, basic education, health, housing and transport. With rapid growth of cities comes the typical urban dimension of poverty.

Government and non-governmental organization efforts to eradicate poverty have proven elusive for a very long time in Nigeria. This may be due to lack of better understanding of the multi-dimensional nature urban poverty. Urban poverty analysis is a tool for providing up-to-date information of what city managers and many actors in the private and voluntary sector need to know when developing city policies, programs and projects against poverty (Demombynes, G., Elbers, C., Lanjouw, J., Lanjouw, P., Mistiaen, J., Özler, B. 2002). A city poverty analysis is a detailed representation that shows how poverty is concentrated in the city, and therefore where relevant policies might have the greatest impact on reducing poverty. Judy Baker and Nina Schuler (2004) stated that a lot of literature has emerged on the definition, measurement and analysis of poverty. Much of this literature focuses on measuring poverty at the national level, or special disaggregation by general categories of urban or rural areas with adjustments made for regional price differentials. For example, the recent study by Canagarajah (1997) documented the distribution of household income and expenditure in Nigeria in the period of 1985-1992. It tried to indicate in which regions and states the poor are concentrated and the extent and severity of their poverty. Yet for an individual city attempting to tackle the problems of urban poverty, this level of aggregation is not sufficient for answering specific questions such as where the poor are located in the city; whether there are differences between poor areas; if access to services vary by subgroup; whether specific programs are reaching the poorest; and how to design effective poverty reduction programs and policies. Answering these questions are critical, particularly for large, sprawling cities with highly diverse populations and growing problems of urban poverty. City poverty analysis and mapping is a tool for providing up-to-date information of what city managers and many actors in the private and

voluntary sector need to know when developing city policies, programs and projects against poverty (Demombynes, G., Elbers, C., Lanjouw, J., Lanjouw, P., Mistiaen, J., Özler, B. 2002).

A city poverty mapping on other is a pointer, a geographical representation that shows where poverty is concentrated in the city, and therefore where relevant policies might have the greatest impact on reducing poverty (Demombynes, G. et. al 2002). City poverty analysis and mapping allows for a relatively easy and intuitive comparison of indicators of poverty with a range of other data that are also available in a spatial format or have spatial dimensions. These include any social and economic information that are for example collected at a city level (Demombynes, G. et. al 2002). It also includes a wide range of information, such as access to infrastructure or services, availability and condition of natural resources, and distribution of transport and communication facilities. Detailed geographic profiles of poverty can be extremely valuable to urban managers, governments, non-governmental organizations and multilateral institutions that want to strengthen the impact that their spending has on poverty. For example, many developing countries use regional poverty maps to guide the division of resources among local agencies or administrations as a first step in reaching the poor. Understanding urban poverty presents a set of issues distinct from general poverty analysis, which also may mean additional tools and techniques (Gabriel et al 2002).

PROBLEM STATEMENT
The major approaches used to measure poverty are quantitative or money-metric measures or by distinctive aggregation of urban or rural. The former utilizes income or consumption patterns to assess whether a household can afford to purchase a basic basket of goods at a given point in time. Granted that money metric methods are useful for estimating poverty levels and making inter-temporal and inter-country comparisons. Such methods however are inadequate considering the multi-dimensional nature of poverty. Based on the argument that, the well-being of an individual does not only depend on income, but includes several other dimensions or capabilities such as health, education, empowerment, access to basic facilities, social and political

exclusion etc. The inadequacies of the tools and approaches to poverty study established are a major constraint to poverty analysis and managing urban areas in Nigeria, moreover analysis and mapping managing urban areas require for spatial disaggregation and more comprehensive and multi data use to aid decision makers and urban mangers in making informed decision.

MATERIALS AND METHODS
Methods of Data Collection
Data were collected through the following;

General household survey and administration of questionnaire;
Two level questionnaires were administered in the study area; the first questionnaire was used to determine the perception of poverty and its indicators. The second questionnaires were used to assess poverty and deprivation in different districts in the study area. These was determined through socio-economic, housing condition survey and public facilities and utilities surveys to ascertain access, availability and reliability of public facilities, utilities and to determine the level of satisfaction by respondents in the study area.

Sampling Technique and Sample Size.
 A systematic sampling technique was used in each district; questionnaires were distributed after any fourths (40) household in each district until the numbers of specified samples were covered. The numbers of districts in Zaria Urban Area are 6 which are Birni (Zaria City), Waje (T/Wada), Tukur Tukur. Hanwa (GRA), Sabon Gari and Samaru. The populations of the six districts were projected from 1991 census figure to 2018 based on 3.5% percent National Average Growth Rate. The sample sizes administered in each district were determined using Krejcie and Morgan 2013 with 95 percent confidence level and margin of error of 5 percent.

The Table I: Districts, Population and Number of Samples.

S/NO	District		Projected	
1	Gari Zaria City	24,979	63,197	381
2	Waie Tudun	46,921	118,710	384
3	Tukur Tukur	20,567	60,237	381
4	Hanwa/GRA	1,258	3,183	241
5	Sabon Gari	35,183	89,019	382
6	Samaru Town	8,831	22,342	377
Total		117172	296,451	2,146

Sources NPC 1991projected to 2018

Method of Data Analysis

The study made use of the Absolute (monetary) poverty measure using Head Count Ratio (HCR) and Relative poverty measures using the Fuzzy set technique. The headcount ratio (HC) is the simplest way of measuring poverty. It gives the percentage of population, which is not above the poverty line. It can be formally defined as follows:

HC= P/N

Where P is the number of poor people (those below a poverty line z) and Nis total population.

The relative measures the fuzzy set: The fuzzy set is characterized by a membership function depicting the levels of deprivation of various categories of indicators or needs. Chili (1995) asserted that poverty is not a discrete attribute characterized in term of presence or absence, but rather a vague (fuzzy) predicate that poverty manifests in different shade, form and degrees, then the methodology framework that uses fuzzy- sets theory may be appropriate.

The calculation of membership function or poverty level of a particular district P(X) a suitable definition of the characteristic vector X, that is defined as a 'n' dimensional fuzzy vector; that is, X = [x1, x2, ..., xn]T. where xk is a fuzzy variable that may represent any economic, cultural, social or environmental factor. As an example, xk may be family income, income per capita, access to educational, housing quality, access to health care, access to services as running water, electricity, etc. To calculate the

membership function P(X) for the given characteristic vector X. A linear weighted sum of the n = number fuzzy components of X are defined as P(X) = F* wk.

 Where F = (F) m are scores determined by frequencies of responses in percentages. This implies that as majority of people has access or obtain a particular need in Districts the estimation of membership function will be non- poor. Example, Halleröd (1994) and Deutsch and Silber (2005) give more importance to deprivation of goods considered as necessary by larger groups of the population, considering the percentage of frequencies taken into account.

RESEARCH HYPOTHESIS
Null hypothesis
The null hypothesis is stats that there no significant difference in level of poverty and deprivation in the districts.
Alternative hypothesis
The alternative hypothesis stats that there is significant difference of in poverty and deprivation level in districts.

RESULT AND DISCUSSION
Indicators of poverty in Zaria Urban Area.
The first step in a multi-dimensional concept of poverty analysis requires identification of some indicators of poverty. Unlike the one-dimensional approach, which takes cognizance of income or expenditure, the multidimensional approach introduces and analyzes a vector variables and attributes retained as indicators of some form of exclusion, deprivation or poverty (Costa, 2002). In order to objectively identify poverty indictors in the study area, five poverty indicators were tested against public opinion. Two additional indicators were established from the survey to include security and access to electricity. The ranges of items are presented on the table below.

Table II: Needs or Indicator of Poverty

S/NO	NEEDS AND OR	NUMBER	PERCENTAGE
1	Livelihood	90	36%
2	Housing (shelter).	22	9%
3	Education.	72	29%
4	Health Care.	5	2%
5	Water supply.	12	4%
6	Electricity.	7	3%
7	Security.	42	17%
		250	**100%**

Source; Author 2018.

Ranking of Poverty Indicators.

Ranking of indicators involved the determination of priorities out of the range of items already established as needs and or poverty indicators. This is achieved through participatory method were respondents were asked to rank in order of priority from the must essential Needs items from the first to the least priority. The survey revealed that means of livelihood (employment) carry the highest percentage followed by education and access to health care services with lowest percentage, which entail that means of livelihood (employment), is the first priority and health care is the least priority as shown in the table 7.

Table III: Ranking of poverty.

S/No	Needs And Or Indicators	Number	Percentage	Priorities
1	Livelihood (Employment).	90	36%	1ST
2	Housing (shelter).	72	29%	2ND
3	Education.	42	17%	3RD
4	Health Care.	22	9%	4TH
5	Water supply.	12	4%	5TH
6	Electricity.	7	3%	6TH
7	Security.	5	2%	7TH
	TOTAL	250		

Source: Field survey 2018

Weighting of Poverty Indicators

In assessing the status of poverty weight were assigned to the established poverty indicators. Weights were assigned depending on the degree of importance of elements perceived by the

respondents, the highest weight of two (0.1) is assigned to the essential need while the lowest is zero point two five (0.015) is assigned to the least need. This ensures that indicators are adequately represented and valued in the scoring of poverty status across.

The poverty level in a District was determined by the summations of scores obtained from the analysis of all the poverty indicators used. The resulting scores were then used to grade districts as very high, high, medium, and low and very low poverty level.

Table IV: Ranks and weight of poverty indicators

S/No	NEEDS AND OR INDICATORS	RANK	WEIGHT
1	Means of livelihood (employment).	1st	0.10
2	Percentage of people above poverty line.	1st	0.10
3	Education.	2nd	0.085
4	Security.	3rd	0.070
5	House (shelter).	4th	0.055
6	Access to water.	5th	0.040
7	Access to electricity.	6th	0.025
8	Access to health care.	7th	0.015

POVERTY AND DEPRIVATION LEVEL BY INDICATORS IN ZARIA URBAN AREA

Poverty and Deprivation Level by Indicators in Zaria Urban Area in Percentages

As mentioned earlier the fuzzy was used to analysed poverty in the study area. The fuzzy set is characterized by a membership function depicting the levels of deprivation of various categories of indicators or needs. Chili (1995) asserted that poverty is not a discrete attribute characterized in term of presence or absence, but rather a vague (fuzzy) predicate that poverty manifests in different shade, form and degrees, then the methodology framework that uses fuzzy- sets theory may be appropriate.

To calculate the membership function P(X) for the given characteristic vector X. A linear weighted sum of the n = number fuzzy components of X are defined as P(X) = F* wk.

Where F = (F) m are scores determined by frequencies of responses in percentages. This implies that as majority of people has access or obtain a particular need in Districts the estimation of membership function will be non- poor. Example, Halleröd (1994) and Deutsch and Silber (2005) give more importance to deprivation of goods considered as necessary by larger groups of the population, considering the percentage of frequencies taken into account.

Table V: ECONOMIC INDICATOR (Employment Rate and Poverty Line)

| S/NO	Indicators/Variables	Birni (ZRC) (%)	Waje (TWD) (%)	Tukur Tukur (%)	Hnawa (GRA) (%)	SBG (%)	SMR (%)
X1	Employment rate	66	77	78	97	68	64
X2	Percentage of population above poverty line.	46	67	72	100	69	62
	Average Score	56	72	75	99	69	63
	Relative Score (Average Score *Relative Weight)	5.6	7.2	7.5	9.9	6.9	6.3

Source; Author's 2018

The calculation of membership function depicted by economic indicator which was measure ed using employment rate and percentage of population above to established poverty of Zaria urban area among the six (6) districts were classified into three categories. The first category is classified as low while the third category is classified a high urban poverty as shown on table V. The lowest economic is recorded in Birni (Zaria City), Samaru and Sabon Gari which connotes high economic poverty which suggest

for instance that employment is low and lowest percentage of people above poverty level in the districts. Moderate economic poverty is recorded in Waje (tudun wada) and Tukur Tukur. The highest economic indicator is recorded in Hanwa GRA which indicate high employment rate and the highest number of people above poverty line as shown on the map below

Figure 1: Zoning Zaria Urban Area Poverty level by Economic Indicator
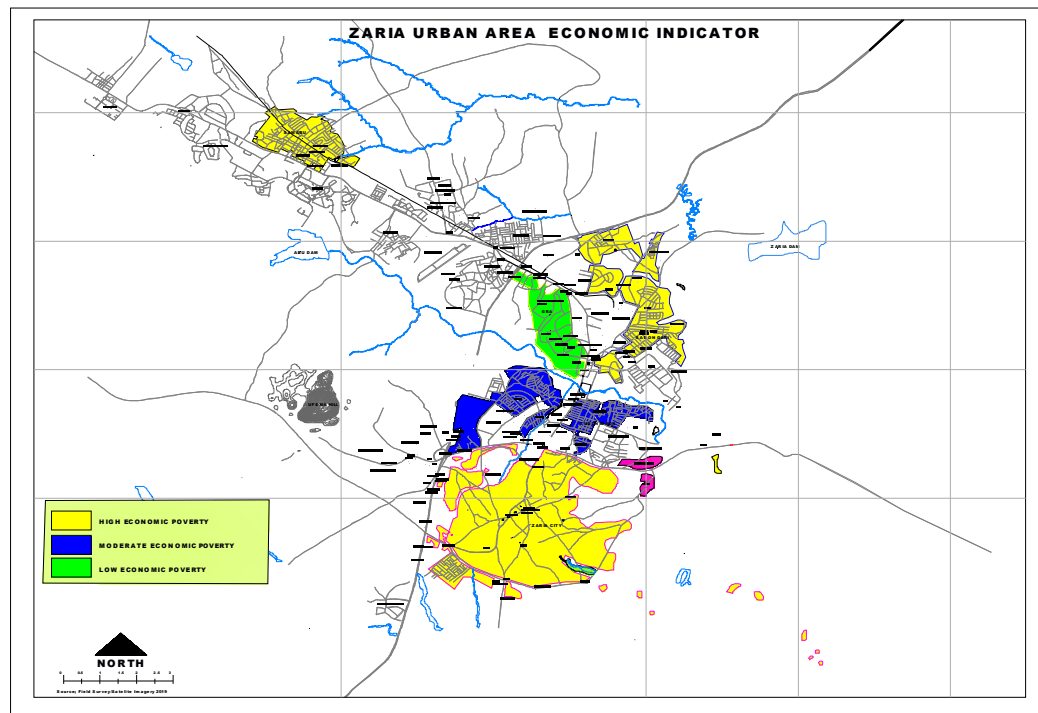
Relative Measurement of Poverty
Sociocultural Indicator

Table VI: Housing Quality

S/N X3	INDICATORS/VARI HOUSING	Birn	Waj	Tuk	Hna	SB	Sama
i	Occupancy ratio above 3.00	57	44	60	97	62	68
ii	Building materials I (threshold; cement and Block)	45	77	71	100	58	54
iii	% of Sound buildings	53	66	75	100	64	69
	Average Score	51.6	62.3	68.6	99	61.3	63.6
	Relative Score (Average Score *Relative Weight)	2.84	3.43	3.77	5.44	3.37	3.50

Source: Author 2018

Table VII: Education

S/No	Indicators/Variables	DISTRICS					
		Birni (%)	Waje (%)	Tuku (%)	Hnaw (%)	SBG (%)	SMR (%)
X7	EDUCATION						
i	No School drop out	53	46	42	100	48	53
li	Adequate Staff and facilities in Govnt Sch.	47	53	50	82	43	46
lii	% Do not attend Government schools	45	46	72	100	56	51
	Average Score	48.66	48.33	54.66	94	49.00	50.00
	Relative Score (Average Score *Relative Weight)	4.13	4.10	4.65	7.99	4.17	4.25

Source: Author 2018

Table VIII: Security

| S/NO X8	INDICATORS/VARIABLES SECURITY	DISTRICS					
		Birn (%)	Waj (%)	Tuk (%)	Hna (%)	SBG (%)	SMR (%)
I	Do not Experience crime	46	73	63	86	74	69
Ii	Is there Police Station in your Neighbourhood (Yes)	56	74	73	89	54	45
Iii	Do you feel safe (Yes)	61	54	62	74	56	67
Iv	Adequate personal Equipment	No	No	No	No	No	No
	Average Score	54.33	67.00	65.00	83.00	61.33	60.33
	Relative Score (Average Score *Relative Weight)	3.80	4.69	4.55	5.81	4.29	4.22
	GRAND TOTAL	10.77	12.22	12.97	17.57	11.83	11.97

Source: Author 2018

The criteria used as sociocultural indicators of poverty in the study area are housing, education and security. Housing was measured using occupancy ration, materials used for building and percentage of dilapidated buildings. Education was measured using school dropout, adequate staff and materials in government school and percentage of pupils that do not attend government schools. Security was measured using the percentage of people

that do not experience crime, presence of police station in a district, safe and adequate personal and equipment.

Estimation of membership functions of sociocultural indicator of poverty has recorded low scores in the districts of Birni (Zaria City), Sabon Gari and Samaru which suggest high poverty level. Moderate Poverty level is recorded in Waje (Tudun Wada) And Tukur Tukur while lowest poverty level; is recorded in Hanwa GRA District.

Figure 2: Zoning Zaria Urban Area Poverty level by Access Indicator
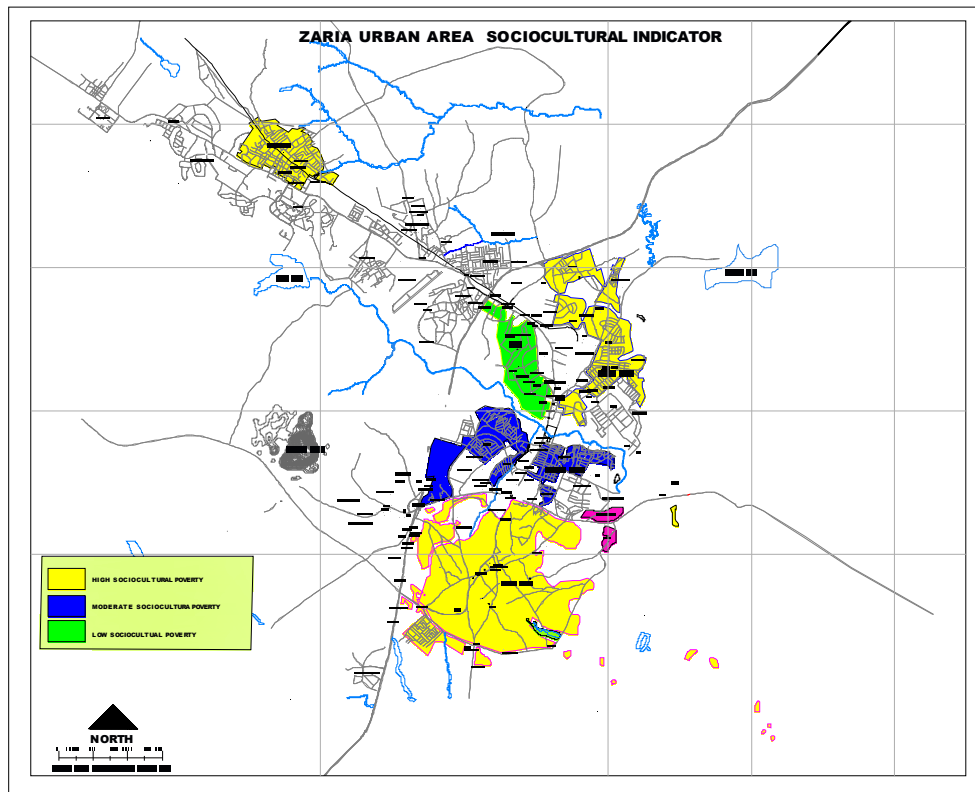
Access to Utilities and services

Table XI: Access to Water

S/NO	Indicators/Variables	DISTRICS					
		Birni (ZRC	Waje (TW	Tukur	Hnawa	SBG	SMR
X4	WATER						
i	Water Network coverage	45	83	56	95	61	42
ii	Running tap water (threshold (5 hours)	38	57	36	97	57	51
iii	No Low water Level in dry season	46	51	40	88	50	64
	Average Score	43.33	63.67	44.00	93.33	56.00	52.33
	Relative Score (Average Score *Relative Weight)	1.73	2.55	1.76	3.73	2.24	2.09

Source: Author 2018

Table X: Access to Electricity

S/NO	INDICATORS/VARIABLES	DISTRICS					
		Birni	Waje	Tukur	Hnawa	SBG	SMR
X5	ELECTRICITY	(%)	(%)	(%)	(%)	(%)	(%)
i	Electricity above the average of 7 hours in a day	59	74	67	96	62	60
Ii	Low Voltage and or Load shedding	58	67	70	100	66	62
	Average Score	58.5	70,50	68.50	98.00	64.00	61.00

	Relative Score (Average Score *Relative Weight)	1.46	1.76	1.71	2.45	1.65	1.53

Source: Author 2018

Table XI: access to Health Care Services

S/NO	Indicators/Variables	DISTRICS					
		Birni	Waje	Tuku	Hnaw	SBG	SMR
X6	HEALTH CARE SERVICES	(%)	(%)	(%)	(%)	(%)	(%)
i	Attended by a doctor or medical personal.	65	61	70	84	63	67
li	Availability of drugs	47	67	53	79	60	54
	Average Score	56.00	64.99	61.50	81.50	61.50	65.50
	Relative Score (Average Score *Relative Weight)	0.84	0.95	0.92	1.22	0.92	0.98
	GRAND TOTAL	2.44	2.71	2.63	3.67	2.57	2.5

Source: Author 2018

Access to Facilities

Access to facilities was measured using two criteria i.e. Water, electricity and health care. Access to water was determined using network coverage and hours of running water, electricity was determined hours of electricity and low shading, while access to health care was measured using attended by doctor and availability of drugs. The estimation of the membership function in term of access to facilities suggest low scores in Birni (Zaria City), Sabon Gari and Samaru,which implies high poverty level. Moderate poverty level was observed in Waje (Tudun Wada) and low poverty poverty level is observed in Hanwa (GRA) which presupposed that people in the area enjoy better access to water and electricity.

Figure 3: Zoning Zaria Urban Area Poverty Level by Access Indicator
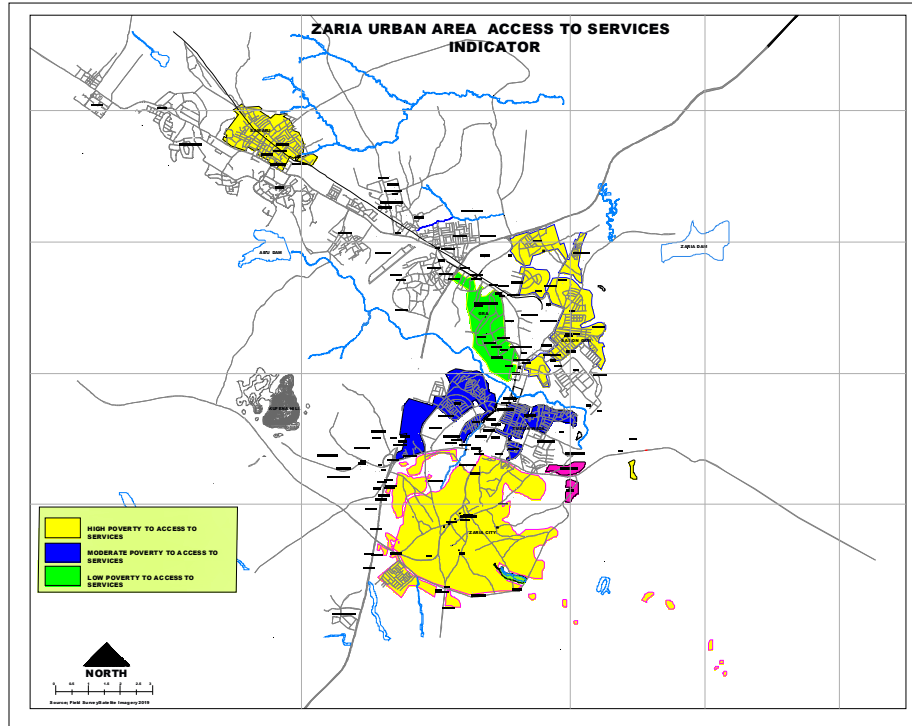
Test of Hypothesis

ANOVA single factor was used to test the research hypothesis, the result of analysis recorded a P-value of 0.035 it can be deduced that we are more than ninety-five (95%) sure that there is significant difference in level of poverty and deprivation in the districts in Zaria urban area. Hence, the null hypothesis is rejected. The analysis is shown on the table below.

Anova Single Factor
Summary

GROUP	COUNT	SUM		AVERAG	VARIANC			
Birni	20	299.4		49.73	165.3106			
Waje	20	1216.		60.81	294.4062			
Tukur	20	1260		763.00	164.4211			
Hanwa	20	1859		92.95	65.41842			
SBG	20	1209		60.45	62.36053			
Samaru	20	1174		58.70	72.43158			
ANOVA								
Source	SS	df		MS	F		p-	F crit
Between	31863,1	5		4372.623	31,82989		3.54-	2.29391
Within	37523.8	114		137.3747				

SUMMARY OF POVERTY AND DEPRIVATION LEVEL

The summation of integrated scores of economic, sociocultural and access poverty indicators obtained from various districts of Zaria urban area shown on table below. The districts were ranked based on the access availability, reliability of physical and social infrastructure?

District	Relative Weight	Rank
Hanwa (GRA)	36.54	1
Waje (Tudun Wada)	24.71	2
Tukur Tukur	24.85	2
Sabon Gari	23.54	3
Samaru	22.85	4
Zaria (Birni)	20.4	5

As earlier stated, the major aim of poverty analysis and mapping is that of establishing status, and defining the patterns. An area poverty analysis and mapping is therefore viewed simply a comprehensive poverty comparison showing variation of poverty across subgroups of society region of residence or district. The result of poverty analysis in Zaria urban area has shown that poverty varies from one District to another. The result has indicators has shown that Hanwa (GRA) has the highest relative weight of 36.54 was ranked first in all the districts. This indicates that people in the District are not only economically buoyant with incomes far above the established poverty line, enjoy the best access and reliable supply of services in the area, which connotes

very lower poverty and deprivation level. Tukur Tukur and Waje (Tudun Wada) with scores of 24.85 and 24.75 respectively ranked was second this implies that that people in the area enjoy moderate access to infrastructure and service which connotes moderately poverty level. Sabon Gari, Samaru and Birni (Zaria city) with scores of 23.54, 22.85 and 20.40 were ranked third, fourth and fifth respectively which indicate that inhabitant in the district, are deficient in all needs or poverty indicators used in analyzing poverty in Zaria urban area.

RECOMMENDATIONS

The research has highlighted many important issues of concern that are associated with urban poverty analysis, i.e. what constitute poverty and poverty indicator, weighing of poverty indicators this was also achieved through participatory method.

Planning and management of urban areas require data, poverty analysis and mapping present an exceptional means to acquiring data for planning and management of urban areas for present and future generation. It is important to note that poverty should not be viewed as single phenomena likewise its analysis should not be based on single criterion. It is recommended that poverty alleviation programme especially for government and interested organizations should be design based on the outcome of poverty analysis of the target population, multi-dimension and disaggregated at various spatial for better result.

CONCLUSION

In conclusion, a city-wide poverty analysis and mapping if produced from well-structured data sets, are necessary in forming a new partnerships, better understanding and better policy targeting and thus achieving results better than that from uni-dimensional analysis.

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