

USING THE CROWDING INDEX TO ESTIMATE THE POPULATION OF LOCALITIES: THE EXAMPLE OF KABBA**BY****Fashagba, I.:** Department of Geography and Environmental Management, University of Ilorin, Ilorin, Nigeria**&****Olorunfemi, J. F.:** Department of Geography and Environmental Management, University of Ilorin, Ilorin, Nigeria; E-mail: worldrewol@gmail.com**Abstract**

The need to up-date population data using indirect method has continued to increase in Nigeria. This is because the country has not been able to conduct census regularly. Over the years, census has not only been fraught with several problems but also carried out infrequently. The poor nature of the population data generation has affected the socio-economic development planning in Nigeria. This study employed the crowding index method to estimate the population of Kabba town. Data for the study were collected through a survey method where four hundred and eleven copies of a questionnaire were administered randomly to 10% of the 4112 household heads in the town. The average number of people per house as crowding index was multiplied by the total number of houses in each quarter to arrive at an estimated total population of the town. The population of Kabba was estimated at 70,870. Hence, the technique is recommended for use in estimating the population of localities and small communities where population data are not only inadequate but is difficult to obtain.

Keywords: Socio-economic, Development planning, Estimation and Nigeria

Introduction

The collection of adequate, accurate, consistent and reliable population data through the census for spatial, political, social and economic development in Nigeria has remained a very difficult task since amalgamation of the North and South protectorates in Nigeria (Odimegwu, 2013; Onyekerayah, 2011; Bamgbose, 2009; Makama, 2007; Mimiko, 2006; PAN, 1990 and Aluko, 1965). Indeed, Nigeria has often carried out censuses on irregular bases. The last census was conducted in 2006. In recent times, need for population data for development has continued to increase. The emergence of the global Covid-19 pandemic with its consequences on Nigeria's economic has further pointed to the need to generate a reliable population data for planning. The need for these data has become so obvious since October 20, 2020 when several youths across most cities in Nigeria took up the streets to protect against government's refusal to end SARS. The fact remains that most of those involved seemed to be unemployed. The last 2006 census, the major source of population data on the economic status of people has apparently become outdated. Consequently, the efforts of the government at providing most essential needs for the people have increasingly become difficult. While every developmental planning requires reliable population data, there is yet no feasibility of conducting another census this year 2021 in Nigeria (nearly seventeen years after the last census).

The need to evolve indirect techniques to estimate population data for localities arises from the exigency of the population data in Nigeria. Indeed, there were no population figures released for all the localities in Nigeria, apart from the fact that the last census was seventeen years old. In the past, a number of scholars had evolved some indirect techniques for population data generation. Ekanem (1972) and Ayeni (1980) estimated populations of different places in Nigeria using indirect techniques. Olorunfemi (1981) employed the crowding index technique to generate the population of Ilorin. According to Olorunfemi crowding index is the average number of people per house in a specific time. His work was faulted for using the data of 1972 and 1981 together to generate 1981 population. Thus, the study seeks to improve on Olorunfemi's work by employing 2015 data only. While the aim of the study is to estimate the population of Kabba, using crowding index, the objectives are to determine the household distribution and identify the average number of people per house in Kabba.

Methodology

Kabba, the headquarters of Kabba/Bunu Local Government is the study area. It is located on Latitudes of $7^{\circ} 45' - 8^{\circ} 28'$ North and Longitudes of $6^{\circ} 5' - 6^{\circ} 30'$ East (Figures 1). The town is situated at about 78km away from Lokoja, the Capital of Kogi State and about 130km away from Abuja, the Federal Capital Territory of Nigeria. The 1991 census of Nigeria puts the population of the town at 36,124 (NPC 1991). However, the 2006 census figures for the town have not been released. Being a local government headquarters, Kabba has remained the main destination for many migrants from settlements around the town. Most people engage in production of food items such as yam, cassava, beans, and other vegetable crops. Plantation agriculture is practiced around the western fringe of the town.

The percentage of civil servants in Kabba appears high because most of the civil servants working in the Local Government Secretariat are residing in Kabba.

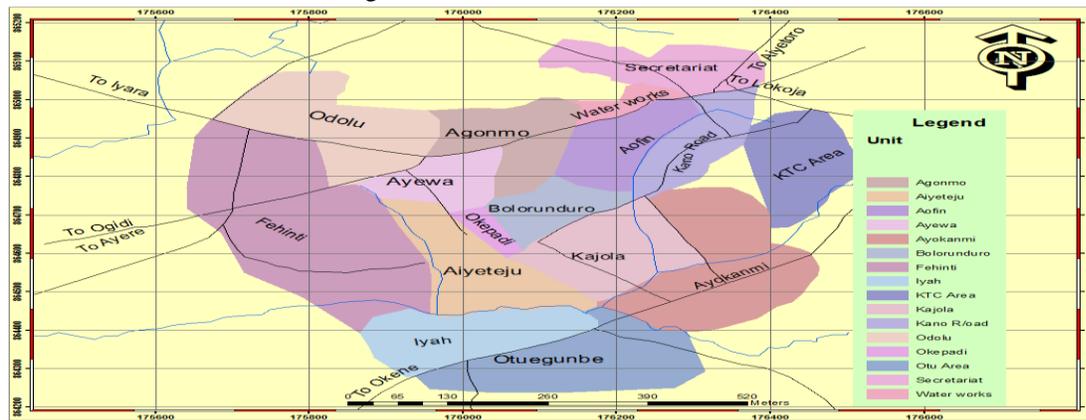


Figure 1: Map of Kabba Town Showing the Sixteen Quarters in the Study area
Source: Kogi State Lands and Survey, 2015.

The data used for this study were collected from a survey using structured questionnaire administered on 4112 households in Kabba. The systematic sampling technique was employed to select respondents from the sixteen quarters in Kabba. In selecting the samples, the first house was randomly selected in the first street of each quarter, while subsequent samples were selected from every fourteenth house, until the last sample in each quarter was selected. The data collected were analyzed using the descriptive statistics. Specifically, the data were summarized using the frequency distribution, simple percentage and the mean (\bar{x}) otherwise refers to as crowding index.

Results and Discussion

The respondents' age, gender, religion affiliation, education, occupation and income distributions are shown in Table 1. About 43% of the respondents are above 50years, while 39% are between 31-50years (Table 1a). The percentage of people below age of 18 is low (2%). The age distribution in Table 1a suggests that early marriage is not common in Kabba. Table 1b shows that about 3/4 of the respondents are males, while less than 1/4 are females. The high percentage of male respondents may be of great help to this study. Indeed, as the head of family, a female respondent from polygamous marriage may only account for her immediate family. Majority of the people of Kabba are Christians (88%). As a matter of fact, all the residents of Aofin, Ayewa and Okepadi quarters are Christians (Table 1c). Usually, religion influences the family size in Nigeria. This, by extension, can affect the population size, structure and growth of any settlement.

Table 1: Age Distribution of Respondents

S/no	Age Distribution	Number of People	%	Cumulative %
1	12-14	0	0	0
2	15-17	07	02.0	02.4
3	18-30	63	15.4	17.8
4	31-50	161	39.2	57.0
5	51 and Above	180	43.0	100
	Total	411	100	-
1b Distribution of Gender				
1	Male	315	76.6	76.6
2	Female	96	23.4	100
	Total	411	100	-
1c Religion Affiliation				
1	Christianity	362	88.0	88.8
2	Islam	46	11.2	100
3	ATR	03	0.06	-
1d Education Qualification				
1	No formal	74	18.1	18.1
2	FSLC	48	11.7	29.8

3	SSCE	74	18.0	47.8
4	HND/Degree	98	23.8	71.8
5	Others	117	28.4	100
	Total	411	100	-
1e Occupational Distribution of Respondents				
1	Farmer	76	18.4	18.4
2	Trading	79	19.2	37.6
3	Business	136	33.1	70.7
4	Artisan	55	13.5	84.2
5	Student	31	7.6	91.8
6	C-servant	22	5.4	97.2
7	Others	12	2.8	100
	Total	411	100	-

Source: Field Survey 2015.

The educational status of the residents indicates that close to one fifth of the people do not have any formal education. This is rather surprising despite the fact majority of the people are Christians and it is known that Christianity brought about western education with it. Beside this, more than 3/4 of the people in Kabba are indigenes (Table 1d) and so traditional values may hold its way in their beliefs towards population issues.

Being the primate town in Kabba/Bunu Local Government, Kabba town would be expected to account for a high number of civil servants. However, Table 1e indicates that only 5.4% of the respondents are civil servants. The presence of the Local Government secretariat as well as offices of the Federal and State commissions, agencies and parastatals in Kabba does not really result in reasonable increase in population. Essentially, facilities such as health care, schools, water work, good road network and light agricultural product processing industries, among others, usually consecrate in primate town such as Kabba. While the presence of all these facilities should of course draw more civil servants to the town, there is low proportion of civil servant population in Kabba.

Composition of Households in Kabba

In an attempt to comprehend the household composition of Kabba, the demographic data were collected, analysed and presented in Table 2. As shown in the table, an average household contains seven persons, specifically a husband (1.0), a wife (1.01), about four children (3.97), and a dependant (1.0). The distribution suggests that Kabba is dominated by a monogamy type of marriage. The “one-wife” “one-husband” marriage life style associated with most Christian homes has affected the average number children per household in the town. Unlike in place like Okene town where polygamous marriage is common, the number of children is always higher than the one observed in Kabba. A recent study carried out in some Islam dominated rural settlements of Apado, Agbeyangi, Iponrin, Morafa, Jebba, Share and Osi areas in Kwara State indicated that an average household contained between 4 and 5 children (Fashagba and Agboola, 2014). The observed number of children per household in Kabba is slightly lower compared to the one on record for South-West region, Nigeria. The record indicated that there are about five children per wife in the region.

Table 2: Summary of Household Structure in Kabba

	Variable	Mean	Standard Deviation	
1	Household	6.53	0.945	
2	Husband	1.0	0.010	
3	Wives	1.01	0.002	
4	Children	3.97	1.122	
5	Dependent	1.0	0.413	

Source: Field Survey 2015

The Crowding Index of Kabba

The crowding index of Kabba was calculated from the primary data generated through questionnaire administration. The result presented in Table 3 indicates that, there is a marked spatial variation in the crowding index per quarter in Kabba. Ayewa quarter has the highest crowding index of 20.9, while KTC area has the lowest of 8.6. The crowding index in Ayewa, Bolorunduro, Kajola, Aofin, Okepadi, Aiyeteju and Kano road quarters are higher than that of Kabba (12.2). One important point to note in this study is that, all the seven quarters identified with higher crowding index (CI) are traditional quarters. These areas are all dominated by indigenous face-to-face house type where the number of people per house is usually very high. In most of these houses, there are usually two or more families. In

certain cases, some houses contain a number of extended family. Generally, all the traditional quarters are located around the Business District and the two main Worship Centres-the Roman Catholic Church and the Kabba Central Mosque (KCM). However, the crowding index in Odolu, Fehinti, Ayokanmi, Agonmo, Secretariat, KTC, Water-work and Iyah quarters is lower than the average crowding index of the town (12.2).

Table 3: The Crowding Index of Kabba

<i>S/no</i>	<i>Quarter</i>	<i>Crowding index</i>
1	Agonmo	10.2
2	Aiyeteju	14.9
3	Aofin	15.8
4	Ayewa	20.9
5	Ayokanmi	8.2
6	Bolorunduro	16.4
7	Fehinti	9.1
8	Iyah	9.5
9	Kajola	16.1
10	Kano Road	14.7
11	KTC	8.6
12	Odolu	10.0
13	Okepadi	15.5
14	Otuegunbe	9.3
15	Secretariat	9.5
16	Water work	10.3
	Ave. Pop per Qua.	12,2

Source: Field Survey, 2015

Population Estimate for Kabba

The use of the crowding index technique for population estimation would appear to be more appropriate in Kabba because the houses are in distinct unit. Each house is built at about 6 meters apart throughout the town. Apart from this, the traditional house type where a series of houses are usually put in a single fence is not common. As indicated in table 4, the population of Kabba was estimated from the average number of people per quarter as 70,870. Out of this, Aiyeteju quarter has the highest number of 7,331 people. Kajola and Fehinti quarters were next with 7,052 and 6,834 people, respectively. Ayokanmi quarter, on the other hand, had the lowest population of 2,158. Next to Ayokanmi are KTC and Otuegunbe quarters with 2,245 and 2,297 people, respectively.

Table 4: Crowding Index per Quarter and Population Estimate of Kabba

<i>S/no</i>	<i>Quarter</i>		<i>Population estimate</i>
1	Agonmo		2,468
2	Aiyeteju		7,331
3	Aofin		4,049
4	Ayewa		3,386
5	Ayokanmi		2,815
6	Bolorunduro		2887
7	Fehinti		6,834
8	Iyah		3,620
9	Kajola		7,052
10	Kano Road		5,851
11	KTC		2,245
12	Odolu		4,550
13	Okepadi		5,647
14	Otuegunbe		2,297
15	Secretariat		4,399
16	Water work		4,439
	Ave. Pop per Qua.		-
	Total	-	70,870

Authors' Field work, 2015

Different from the Olorunfemi 1981 population estimate where the 1981 crowding index of Ilorin was assumed to be the same with the crowding index of 1972, the 2015 crowding index of Kabba was employed to determine the 2015 population as earlier stated.

Conclusion and Recommendations

This study has determined the crowding index of Kabba. The crowding index in turn was used to estimate the population of Kabba. The study observed that there is a substantial variation in the occupations of the people in all the 16 quarters in the town. The percentage of farmers in Kabba is low. Majority of the people in Ayokanmi quarter, a modern quarter are civil servants, while about half of the people in Water work area and Aiyeteju quarter are traders and Businessmen, respectively. Further, about one third of the households earned less than #18,000 the previous minimum national monthly salary in Nigeria, while 60% of the people earns between #18,000- #100,000 per month. Only 7.06% earned #100, 000 and above per month.

An average household contains 7 persons, precisely, a husband, a wife, four children and a dependant. The distribution of people per house in all the quarters in Kabba is influenced by socio-economic status such as education, occupation and income, among others. Large population of the low income earners dominated the traditional quarters, while modern quarters have low population of high income people. Among the quarters, Ayewa quarter has the highest crowding index of 20.9, while Ayokanmi quarter has the least of 8.2. Using the crowding index, the total population of Kabba was 70,780.

Based on the findings of this study, the crowding index method of population estimation is suggested for estimating the population of various localities in Nigeria and other places outside Nigeria that have similar problem of population data generation.

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