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URBAN SUSTAINABILITY: TOWARDS UNDERSTANDING THE STATUS OF ZARIA URBAN AREA-NIGERIA

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ABSTRACT
Globally, the sustainability of the urban areas has become an issue with alarming concern. However, the status of most cities in the world remain unknown, with more effort geared toward the cities of the advanced countries, so as to create sustainability rankings. Conversely, the chaos and lack of uniformity in sustainability assessment tool has also contributed to the knowledge gap. In this study, the urban sustainability of Zaria urban area was assessed, focusing on the social dimension of sustainability, due to data availability. Data available within 2018 was used for the assessment using the theme-based indicator assessment framework. Results from the study showed that out of the 14 indicators assessed, only 3 indicators can be said to have a relatively good status, for this reason the sustainability of the urban area was low, resulting to the challenges of unsustainability in the urban area.

Keywords: Urban sustainability; theme-based indicator framework; Zaria urban area.

INTRODUCTION

Urbanization is greatly altering the relationship between society and the environment, and thereby affecting cities in ways and rates that hinder sustainability (Romero-Lankao, Gnatz, Wilhelmi and Hayden, 2016). It is estimated that almost 70% of the world population will live in urban areas by 2050 especially in the developing countries (United Nation, 2012).

As the world continues to urbanize, the social sustainability even in the urban areas is becoming a major concern (Huang, Wu and Yan, 2015). Rapid urbanization has caused series of environmental and socio-economic problems globally, hence, more concerns about sustainability (Li and Li 2017). Indeed, these have led to the global call for sustainable cities as entailed in the Agenda 21 and Goal Eleven of the Sustainable Development Goals (Sustainable cities and communities).

Sustainable development is seen differently by different school of thoughts (economic, ecology and ecological economics), but the most common definition is that which is provide by Brundtland Commission: 'Development that meets the need of the present without compromising the ability of future generations to meet their own needs' (WCED, 1987, p. 41).This definition is argued to be vague definition: '…. Meet the need of all stakeholders, whilst paying lip service to the needs of the future generation' (McKenzie, 2004). Similarly, several definitions for urban sustainability has being put forward and they are mostly in relation to sustainability definition provided by Brundtland commission. Wu suggested urban sustainability to be:'a set of dynamic conditions that satisfy the needs of current and future generations in an urban area, which function as an ongoing adaptive process of achieving and maintaining those conditions' (Wu, 2014).

Measuring the sustainability of urban area has now become crucial because it is vital to regional, national and global sustainability. As such, sustainable development indicators can serve as a reliable base for regular monitoring of the progress towards the attainment of specific goals of the sustainable development and the assessment of several aspect of sustainability, given the dimensions of sustainable development as social, economic, environmental and institutional or governance in some cases.

At the international level, there are several indicator frameworks for assessing sustainability, the most common among literatures are; the monetary based framework, the accounting framework, the issue or theme-based framework and the pressure state response framework. But one of the principled, robust and comprehensive frameworks, is the theme-based indicator framework adopted by the United Nations Commission on Sustainable development (UNCSD, 2001), which suggested 4 dimensions, 15 theme, 38 sub-theme and 58 indicators. For this study the well organized and accepted UNCSD framework was adopted for assessing the status of urban sustainability in Zaria urban area with focus on only the social dimension and its indicator.

Zaria is ranked as the 8th largest city in Nigeria in terms of population (World Population Review, 2018). As one of the major centers for educational advancement and cultural heritage in Nigeria, and the second most urbanized and economically developed urban center in Kaduna, the city is experiencing rapid

urbanization and population increase, structural and functional changes, hence deteriorating environmental conditions within the city (Aliyu and Botai, 2018; National Population Commission, 2018; Shuaibu, 2016; Kajuru, 2015).

It is estimated that by 2050 Nigeria will be the third most populous country in the world, after China and India (UNDESA, 2017). The impact of this growth will be mostly felt in the urban areas and Zaria is one of such urban area. The environmental and socioeconomic impacts of urbanization constitute what can be believed to be one of the most important issues of sustainability (Alberti and Susskind, 1997)

In the recent decade concern about urban sustainability has been growing due to the rapid urbanization and associated environmental problems (Li and Li 2017). Studies have shown that Zaria is experiencing multiple sustainability issues, but from all these studies, there is no clear or well-defined evidence that these studies are linked to urban sustainability. Most of the researches on urban sustainability have focus on cities in the advanced countries and little is known about cities in the developing world where the challenges are more severe, particularly cities in sub-Sahara Africa. Also, the use of the theme-based indicator frame for urban sustainability assessment is limited to few studies. Hence, this study seeks to measure the urban sustainability of Zaria urban area, Nigeria from social dimension of sustainability.

The main objective of the study is to measure urban sustainability of Zaria urban area using the theme-based framework of sustainability.

MATERIALS AND METHODS

Study Area

Zaria Urban area covers about 363.163 km^2, it is located between latitude 10˚57'36"N to 11˚15'32"N and 7˚39'00"E to 7˚53'02" E of the Greenwich meridian. The urban area is made up of Sabon Gari and Zaria local government areas (Figure 1). Zaria's history is tied to the old walled city, probably founded in about 1450 as the kingdom of Zazzau, which late became a tributary state of the Songhai Empire (Kaduna State Government, 2009. It has more of a tropical climate, with more rainfall in summer.

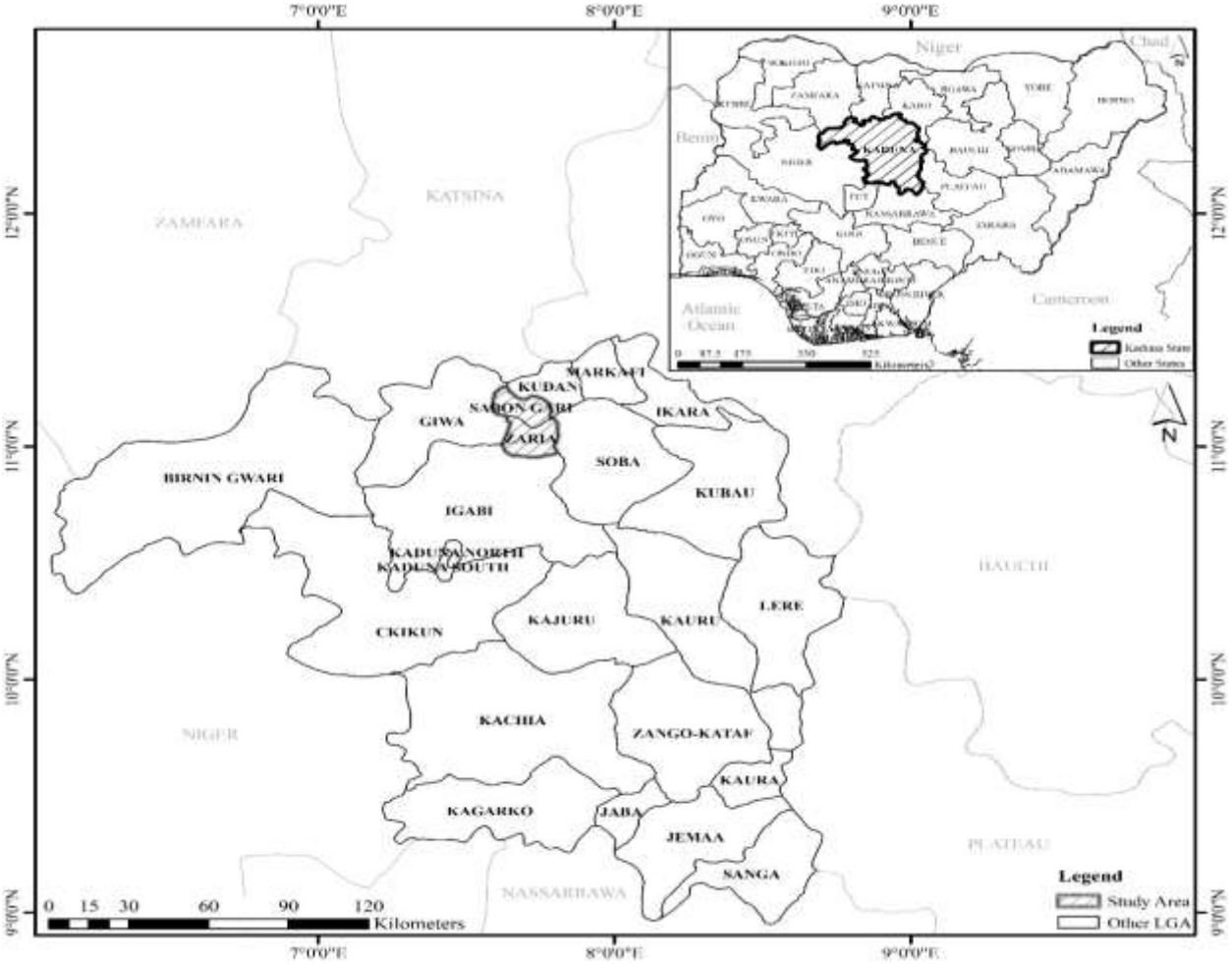

Fig. 1. Location of Zaria urban area.

According to the 1991 census, the population of Zaria was estimated for 508,385, whilst the 2006 census estimated Zaria's population to be 698,348 which constitute 338, 337 females and 360,017 males (Kaduna State Government, 2018; Sabon Gari

and Zaria Local Government Development Plan 2018-2020). In 2018, Zaria was estimated to have a population of 991,654, using the population from the 2006 census and a population growth rate of 3.5%. This estimate is similar to the estimate by the World Population Review (2018), the organization estimated that Zaria has a population of 975,153 in 2018 and ranked Zaria as the 8th largest city in Nigeria.

Perhaps, more important to the economy of the Zaria region in recent times, is the concentration of educational institution in Zaria town that has changed the employment dynamics. Zaria today, serve as the educational nerve centre of northern Nigeria, which is reflected by the location of some national educational and research institutes in Nigeria.

Data and Methods

Data Collection and Urban Sustainability Indicators

The study solely relies on secondary data obtained from various agencies or organizations at both state or national level, which was then interpreted for the purpose of analysis. The data required are basically statistical and documented data, which was collected directly from different sources (Table 1); the Kaduna State Bureau of Statistics (KDBS), National Bureau of Statistics (NBS), World Health Organization (WHO) and UNICEF – Kaduna field office, National Population Commission (NPC), Kaduna State Primary Health Care Development Agency (KSPHCDA) and some scholarly and international organization's publications that was accessed from online repository

Taking into cognizance the theme-based indicator framework for sustainability assessment adopted by United Nation Commission on Sustainable Development, (2001)and the availability of data, only social dimension of sustainability was assessed, due to the fact that environmental data were lacking, economic and some social data, such as crime data were give too much confidentiality, whilst obtaining institution data was difficult.

Table 1: List of selected indicators for urban sustainability assessment in Zaria urban area.

Dimension	Theme	Sub-Theme	Indicator	Data Source
Social	Equity	Poverty	Population living below poverty line	KDBS
			Unemployment rate	KDBS
	Health	Health care	Number of health workers per 1000	WHO/ SPHCDA
		Nutritional status	Nutritional status of children	NBS/UNICEF
		Mortality	Mortality rate under 5 years old	UNICEF/ KSPHCDA
		Sanitation	Population with adequate sewage disposal facility	KDBS
		Drinking water	Population with access to safe drinking water	KDBS
		Healthcare delivery	Population with access to health care facilities	WHO
			Immunization against infectious diseases	WHO/ KSPHCDA
			Contraceptive prevalence rate	NBS and UNICEF
	Education	Educational level	Children completing primary school	KDBS, NBS and UNICEF
		Literacy	Adult literacy rate	KDBS
	Population	Population change	Population growth rate	NPC
	Housing	Living condition	Housing condition	KDBS

Source: Adopted from United Nation Commission on Sustainable Development (2001)

Most data were obtained directly or calculated based on the data from the sources mentioned in Table 1. Hence, data for the social dimension of sustainability that were readily available and accessible from various organizations within the time frame of 2018 were collected.

Considering the non-availability of some data, the other three dimensions of sustainability and a number of indicators were not measure in this study, despite their importance. For certain indicators, such as Adult Literacy which is supposed to cover literacy data for adult population 15 years and above. The data available and collected was for 15-24 years, which was used in place of the data for 15 years and above due to little or no significant effect on it will have on the outcome of the analysis.

Data Analysis

Normally, data for sustainability assessment are being normalized into values within the range of 0 to 1 (unit free values), this is done in order to make trend analysis and comparison at various levels possible, but because of the non-availability of data, normalization was not applied to the dataset for this study. However, the data from this study was analyzed using the descriptive statistics, by calculating percentages and averages.

In trying to better understand the status quo of urban sustainability in Zaria urban area, some of the results from the analysis were compared against national average, international standards or targets. Here, international standards or target are those developed by international organizations or committees of nations for use worldwide. Most targets used are from the SDGs targets.

RESULTS AND DISCUSSION

From the data collected (Table 2), which showed the status for the indicators in Zaria Urban area (current status of all the indicators).

Table 2: Status of the selected indicator for urban sustainability assessment in Zaria urban area

Equity	
Population Living Below Poverty Line	82.15%
Unemployment Rate	28.2%
Health	
Number of Health Worker Per 1,000 Population	0.164 health worker per 1,000
Nutritional Status of Children	• 34.0% of the children population are underweighted[1] (Weight for age) • 47.0% are stunted[2] (Height for age) • 11.7% are wasted[3] (Weight for height)
Mortality Rate Under-five Years Old	185 under-five children die before their fifth birthday
Population Using Improved Sewage Disposal Facility	65.85%
Population with Access to Health Care Facilities	93.6%
Immunization Against Infectious Childhood Diseases	Only 24.9% of children received full immunization
Contraceptive Prevalence Rate	75.9% of the women or partner married or in union do not use any contraception method
Education	
Children Completing Primary School	79%
Adult Literacy Rate	59.8%
Population	
Population Growth Rate	3.0%

Result from the data analysis showed the severity of poverty in the urban area with 82.15% of the population are living below the poverty line of $1.9 per day. This implies a worse state of poverty for the urban area, making it far from achieving the Sustainable Development Goal (SDG) 1.1 and 1.2 (eradicate extreme poverty for all people and reducing by half the proportion of men, women and children of all ages in poverty). The 28.2% unemployment rate can be said to have contributed to the level of poverty in the urban area, it also indicates the gravity of economic challenges faced and the gap between achieving full and productive employment and decent work for all, as entailed in SDG 8.5. Disaggregated data for unemployment indicates shows that there is an employment bias towards men, with a lower unemployment among men and higher rate among women. The unemployment was also found to be predominant among the young (18-35 age group).

The performance for population with access to health care facilities, this indicator was satisfactory, even though 6.5% are deprived access to health care facilities, which is against the universal health coverage target as entailed in SDG 3.8. The urban area has less than one (0.164) health worker for every 1,000 population, which is less than the World Health Organization standard at 2.28 health

[1]Children whose weight-for-age is more than two standard deviations below the median of the reference population are considered moderately or severely underweight.

[2] Children whose height-for-age is more than two standard deviations below the median of the reference population are considered short for their age and are classified as moderately or severely stunted.

[3] Children whose weight-for-height is more than two standard deviations below the median of the reference population are classified as moderately or severely wasted.

workers per 1,000 population (2.28: 1,000). Result from the analysis also showed that Nutritional status of children as underweight (34.0%) and stunting (47.0%) has very high prevalence when compare with the growth and malnutrition cut-off value. Wasting is serious in children, thereby signifying the need for a swift action in order to end all form of malnutrition by achieving the international target on stunting and wasting in children under 5 years of age as entailed in SDG 2.1.

Table 3. Growth and malnutrition cut-off values for public health significance

Indicator	Prevalence cut-off values for public health significance
Underweight	< 10%: Low prevalence
	10-19%: Medium prevalence
	20-29%: High prevalence
	≥ 30%: Very high prevalence
Stunting	< 20%: Low prevalence
	20-29%: Medium prevalence
	30-39%: High prevalence
	≥ 40% Very high prevalence
Wasting	< 5%: Acceptable
	5-9%: Poor
	10-14% Serious
	≥ 15%: Critical

Source: WHO, (2010).

With a serious state of affair for number of health worker and nutrition in children, mortality rate for under-five stand at 185 per 1,000 which is remarkably high when compare to the SDG 3.2 target of reducing under-five mortality to at least as low as 25 per 1,000 live births. The value for the use of improved sanitation facilities is targeted at 100% universal coverage and still yet 26.3% of population still used unimproved sanitation facility, thereby increasing the potentially risk and frequencies of diseases associated with excreta from the use of unimproved sanitation facility.

In spite of the tremendous effort by the state government to improved portable water availability and meeting up to SG 6.1 (achieving universal and equitable access to safe and affordable drinking water) particularly in Zaria urban area, 31.5% of the population are deprived access to improved water sources. To a certain level, this can also be said to be in concordance with the result of Abdulkareem, (2014), which stated that Zaria is experiencing high to severe water poverty.

According to Global Strategy for Health and the Ninth General Programme at Work, all children and 90% of children respectively should be immunized against diphtheria, tetanus, pertussis, measles, poliomyelitis, tuberculosis and hepatitis B (UNCSD, 2001), but the status for Zaria urban area is only 24.9%, which is unsatisfactory.

Contraceptive knowledge has rapidly grown over time. However, taking cognizance of the effort made by the government and nongovernmental organization in Nigeria toward improving access to family planning, yet 75.9% of women currently married or in union use no contraceptive method, which might be due to cultural, religious belief or misconception about the use of contraceptives. The low contraceptive prevalence rate could be the reason the urban areas' population growth rate is 0.4% greater than the national growth rate and why it is the 8th largest city in Nigeria, in spite of its low economic opportunities. The rate of population growth can be the causative factor for high unemployment rate of 28.2%, which is above the National Bureau of Statistics estimate for national unemployment rate of 23.1% in the third quarter of 2018. Also, the high population growth rate will consequently affect the housing demand, the performance for the majority of characteristics for housing condition was deem acceptable.

SDG 4.1 is of the target to ensure that all girls and boys complete free, equitable and quality primary school, but the urban area has up to 21% drop-out, this is a significant percentage that need to be given consideration in children completing primary school indicator. Conversely, were adult literacy is supposed to stand at 100% or full literacy (SDG 4.6), its' adult literacy stands at 59.8% for the urban area.

CONCLUSIONS

The urban sustainability of Zaria urban area was assessed by focusing on the social dimension of sustainability using the robust theme-based indicator framework adopted by UNCSD (2001). This study showed that majority of the indicator has a severe status; population of people living below poverty rate, unemployment rate, number of health workers per 1,000, nutritional status of children, Mortality rate of under-five years old, population with access to improved sewage disposal facility, immunization against infectious childhood diseases, contraceptive prevalence rate, adult literacy and population growth. Whilst indicators such as access to health facilities, children completing primary school and housing are relatively satisfactory, as they are closer to the target or standards used for comparison. Hence, the sustainability of the urban area was low, resulting to the challenges of unsustainability in the urban area. Subsequently, the theme-based indicator frame work adopted for this study has allowed for the inclusion of 14 indicator and can be resourceful to stakeholder and decision makers,

especially with the effort of the Kaduna state government of making Kaduna cities safer, building inclusive societies and contribution to global protection as entailed in the State Government Sustainable Development Goals report, 2017.

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