Pedestrians Experience in Nigerian Cities; Case Study in the City Centre of Jos Metropolis

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Abstract
Urbanization in Nigeria have major impact on the infrastructures of cities throughout the country. For instance, infrastructures in Nigeria particularly, in cities are experiencing defacement as the results of part or complete occupation of sidewalks by commercial vendors particularly on most major roads and streets. This paper therefore, appraised the experiences of pedestrians as result of the implications on the occupation of sidewalks by petty commercial vendors and transport workers. Relying on questionnaire surveys, interviews and observations, the paper seeks to identify the adequacy of the sidewalk and the experiences of pedestrians and the implications on movements and circulations in Ahmadu Bello way in Jos metropolis. Results reveals that the street lost its boundaries consequently its character and definition. It also showed that between 70 percent and 75 percent of the population within Ahmadu Bello way do not enjoy a stress and tension free movement and circulation within the street. The experience has a mental and psychological effect on health of the citizens. Thus, an improvement on movements and circulations of pedestrians in city centres would certainly improve the mental and general well-being of the people and help in addressing emerging issues and challenges in urban infrastructures. It is intended therefore, that the findings and conclusions established in this paper could advance the development of strategic spatial planning in Nigerian cities.

Keywords: circulation, commercial, pedestrian, sidewalk, vendors

Introduction
Nigerian cities are witnessing high rate of environmental deterioration and are rated among urban areas with the lowest livability index in the world (Adedeji D. & Eziyi O. 2010). The concentration of large population in cities and the consequences of urbanization have negative results especially in developing countries such as Nigeria. Heavy traffic, air, noise pollutions, and crowded environments for living and working are some of their results.

One of the worsening city infrastructures is the sidewalk. Sidewalk is a fundamental aspect of movement and circulation network especially in city centres. Although studies such as Okojie, C.E., 1987; Nwabueze, M., 1992; Ojo O. D., 2013; have identified various environmental problems in Nigeria, little attention has been given to the implications for pedestrian experiences in city centres. It is a fact that according to Adedeji D. & Eziyi O. (2010), Nigeria's urban population has increased rapidly over the past 50 years and will continue to grow relatively fast in the coming decades. Nigeria's urban population in which the urbanization rate is around 50 percent currently, with an overall population estimated at 200 million will nonetheless likely double within the next 30 years, possibly much sooner (Bloch R., Fox S., Monroy J., and Ojo A. (2015). Furthermore, it has been estimated that the world's population is put at about 6.572 billion

people out of which the United Nations data indicated that about 3 billion people (about 50 percent) live in urban areas (UNCHS, 2007). Whereas about 66 percent of the entire world's population lived in the countryside in the early 1950s (World Bank, 2000; IMF, 2006), current estimates show that by 2030, about 61 percent of the total population in the world will be living in cities; and that all the world's increase in population in the next three decades will occur in low- and middle-income countries (Peters, 2000, UNFPA, 2007). In view of the implications of the increasing urban population for urban and spatial developments in low and middle-income countries, it is incumbent on Federal and State governments in Nigeria to address the overwhelming challenges of provision of urban basic services, infrastructures especially urban road networks.

Again, Madu (2007) submitted that the rapid growth in world population is a major cause of many environmental challenges. According to UNFPA, 2007) conservative estimates indicated that within the next two decades, 87 percent of the population growth in Africa will take place in urban areas out of which about 55 percent would be living in urban areas. In view of the increasing environmental deterioration as a result of rapidly growing urban population without proportionate economic growth, has continue to put stress on the urban environments. Thus, the importance of sidewalk in developing countries like Nigeria is, continuously because vehicular access and informal commercial operators are overwhelming increasing in cities consequently, the remaining pedestrian urban spaces are becoming more occupied and less identifiable.

However, Ewing R, Handy, SL (2009) wrote that well-designed, safe and accessible sidewalks can help contribute to healthier communities and healthier residents. Again, he noted that integrating physical activity such walking into daily life is a key part of addressing related chronic diseases such as diabetes and heart diseases. Furthermore, sidewalk helps to promote walking as a transport mode by making the walking experience more enjoyable. It promotes pollution free environment. It is true that pedestrianization creates a pleasant environment as people can be involved in different social, cultural and tourism activities on sidewalks as well. Thus, sidewalks are the fabric binding these elements together, a key component to creating and sustaining healthy environments.

However, this study of sidewalks is not from the standpoint of those who drive past them or of those who plan, design or construct them, but of those who use them. It is the point of view of the pedestrian that is the person inhabiting and experiencing the sidewalk almost on daily basis. Its approach is pragmatic rather than philosophic or physiological.

Problem Definition

It is accurate to say that Ahmadu Bello way in Jos is potentially a tourist attraction. It could have a high tourist and livability index as it encompasses some amazing post-colonial and typology of contemporary buildings. However, the potentiality has been made redundant by the encroachment of informal commercial hawkers and vehicles on pedestrians' sidewalk. It makes movement such as walking and circulation inconvenient, tiresome, stressful and unhealthy. Consequently, the situation does not allow the provision of streetscapes and landscape elements for pedestrians to use and enjoy. It therefore, indicate that Ahmadu Bello way in Jos is not, a pedestrian-friendly street. It is a fact that, a lot of works has shown that environmental and urban designs can play a crucial role in improving public health. For instance, a growing body of research suggests that evidence-based architectural and urban design strategies can increase regular healthy physical activity and healthy eating. Today, architects, urban designers, and planners can help address some of the most urgent and widespread epidemics related to diseases, such as diabetics, high blood pressure and heart failure and of recent pandemics such as Covid 19.

Theoretical Framework

Sidewalk according to Loukaitou, et al (2009) is a space defined by four planes: a ground plane, a canopy, a roadside, and a building side, all contributing to the spatial quality of the spatial space and to the overall experience within it. Again, another definition as defined by Nasim (2008) is the removal of vehicular traffic from city streets. For instance, in some western nations, sidewalk is defined as to restrict vehicle access to a street or area for exclusive use of pedestrians. It is the norm that, environmental challenges are classified under the broad titles of natural and artificial, based mainly on their mode of occurrence. Natural events occur suddenly and swiftly and consequently cause severe damage to the society and surrounding (Santra, 2011). Artificial challenges are influenced or induced by man. They have some elements of human error, negligence and or intent. In this study the challenge is man-made. Sidewalk experience is not a static condition, but a dynamic spatial framework that people experience at their own paces. The pedestrian experience occurs within a space shaped by a variety of physical elements, all of which contribute to its individual character. Among the physical elements it includes buildings, drain channel, road, landscaped elements and canopy. The presence, scale, and composition and placement of these elements matter a great deal.

Devoted spaces for pedestrians to walk within the roadway have existed for thousands of years. (Loukaitou-Sideris A, Ehrenfeucht R. 2009). While sidewalks are designed mostly to allow safe pedestrian movement separated from moving traffic, they have always been about much more. Sidewalks provide a fundamental network of public open space that allows pedestrians to negotiate their way through the built environment at safe distance remove from moving vehicles while simultaneously contributing to a healthy and active lifestyle. They can also be places of personal interaction and engagement, social spaces to see and be seen, places of economic trade, and platforms for collective speech and gatherings. They again are spots and places for exchange of ideas. Again, sidewalk increased use of public transport by reducing the number of private vehicles on the road. In addition, sidewalks can be transitional zones between public and private spaces. However, often adjacent building users could distort this boundary between public and private space by visualizing sidewalks as physical extensions of their shops and businesses and as socioeconomic extensions of their shops and living rooms. It is true that sidewalk became one of the most active and vibrant elements of the city, helping shape a city's identity.

By the late nineteenth century, urbanization was increasing, with more vehicles and due to migration people are populating the city and the streets. Consequently, sidewalks became increasingly critical as a key means of public circulation, and states and local governments began to pay less attention on their public jurisdiction over them, including control of how they could be used. This situation reveals that the governments and authorities have in one of their key responsibilities in our urban environments.

Method

The method adopted for this study uses a questionnaire survey. A similar method was adopted by Adamu Tal, M.S. (2017) in his study on the investigation into the impact of street commercial activities in the city centre of Jos, Nigeria. The answers reported in this current study are the results of a medium-scale survey which was carried out within Jos city centre. Respondents were purposively selected. The study utilized the administration of structured questionnaire as tool of data gathering. Questionnaire strategy was adopted because of its simplicity and freedom for independent judgments by the respondents.

Data presentation

The schedule developed in this study classified all the response data into five major categories: age profile, educational attainment, occupation of respondents,

sidewalk and street components, building category and type of commercial activity. All data were categorical. Table 1.1, shows the breakdown of the population and the selected sample surveyed of the various group of respondents for the study. The selection was purposive. The purposive sampling technique is the deliberate choice of respondents due to some qualities the respondent possesses regarding the subject matter of the study. It is a non-random technique that does not need underlying theories or a set of number of respondents. Simply, the investigator decides what needs to be known and sets out to find people who can and are willing to provide the information by virtue of their knowledge or experience on the subject matter (Bernard 2002, Lewis &Sheppard 2006).

The total sample selected and utilized in the study is 123 respondents. This sample represents about 37% of the total population of respondents which was found as 335.

Total groups Questionnaire Administered

Questionnaires were administered to respondents in their respective establishments and places of work, residences or businesses (Table 1.2). Respondents were asked or requested to fill the questionnaire. Out of total number of 123 questionnaires distributed and administered, a total number of 113 (91.86%) were successfully returned. This response rate is considered adequate as according to and Idrus and Newman (2002), a response rate of 30% is good enough in urban and architectural studies.

Age Profile of Respondents

In Nigeria, the urban economy accounts for about a third of the 50 million labour force out of 123.9 million people (UNDP 2014). Nwaka (2004) noted that the main economic activity in the urban economy is retail trade and most informal commercial operators in this sector run front shops, stalls, kiosks or squat in open spot and display goods as part or full – time activity by many hawkers. The age profile revealed that the age distribution of majority of the respondents falls between 18– 30 years (41.59%). This shows that majority of the operators are youths who are mainly workers or living within the study area. About 22.12 % of the respondents fall within the age bracket of 31 – 40 years while 15.04 % fall within the ages of 41-50. And 11.50% fall within the ages of 51-60. Lastly, 9.73% were over 60 years of age.

Table 1.1 Total Samples of Respondents using purposive sampling technique

Group of Respondents	Total population	Sample surveyed	Percentage of sample
Architects	39	29	74.35
Planners	21	12	57.14
Commercial Operators	57	27	47.36
General public (Experienced)	146	55	37.67
Total	263	123	46.76

Table 1.2. Total Group Questionnaire Administered to Respondents

Study Area	Total Questionnaire Administered	Total Questionnaire Recovered
Ahmadu Bello way	123	113 (91.86%)
Total	123	113

Table 1.3, Age Structure of Respondents

Age Bracket											
18-30		**31-40**		**41-50**		**51-60**		**61-70**		**Total**	
Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
47	41.59	25	22.12	17	15.04	13	11.50	11	9.73	113	100

Educational Attainment of the Respondents

Majority of respondents 40.70% had secondary education. while, 18.58% of the respondents had attained primary education. Again, 25.66% of the respondents had attained tertiary institutions. However, in informal education and training there were only 9.73%. In general terms the educational level of the respondents revealed a disturbing trend in the socio-economic life of most of the respondents. Typically, the result pattern indicated that the job of urban informal commercial hawking which was associated which illiteracy is no longer a job for only the illiterates. This is more so as, the results revealed from the questionnaire shows that the job is also engaged in by part of the multitude of unemployed graduates from higher institutions. Thus, result indicated that respondents were sufficiently educated to respond to the questionnaire adequately (table 1.4).

Occupation of Respondents in the General Public Category

Table 1.5 shows the occupational structure of the respondents. The table revealed that (59.29%) of the respondents are informal commercial operators. The results also showed that (9.73%) are civil servants and, (13.27%) respondents work in private firms while 11.50% were in transport business. Also, lastly 11.50% were unemployed (table 1.5). The composition of the various respondents indicates a well-balanced population sample according to Idrus and Newman (2002).

Table1. 4, Educational Attainment of Respondents

Informal		**Primary**		**Secondary**		**Tertiary**		**None**		**Total**	
Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
11	9.73	21	18.58	46	40.70	29	25.66	6	5.30	113	100

Table 1.5: Occupation of Respondents in the General Public Category

Occupation	**Frequency**	**% Frequency**
Operators	67	59.29
Civil Service	11	9.73
Private Firm	15	13.27
Transportation	13	11.50
Unemployed	13	11.50
Total	113	100

Fig. 1. Typical scenery of Ahmadu Bello way, Jos (one can observed obstructions located on restricted pedestrian sidewalk). Source; Author's 3D Sketch 2017

Descriptive statistical analysis

The analysis of the responses revealed a comparative absence of differences among the questionnaire. For questions one, all (100%) of the respondents agreed that they were familiar with Ahmadu Bello way. In question two, 73.71% of respondents disagreed that the dimensions of sidewalks are adequate. However, 11% do agree. The results revealed that there is deficiency in the design of the sidewalk. Again, the results showed a high level of density and intensity of informal commercial activities and hawkers in Ahmadu Bello way in the city centre of Jos. The questionnaire surveys conducted in Ahmadu Bello way in Jos city of about 900,000 (2006 Nigeria, census) populations reveals that urban informal commercial operators and hawkers carry out their activities in virtually on sidewalks within Ahmadu Bello way in Jos city centre. Result from question five the urban informal commercial operators and hawkers occupying and using make shift temporary structures, represent 79.7%. For questions four the results are displayed in table 1.6.

Physical Measurements Survey

First, is to determine the impact of informal commercial operators' activity on the sidewalks in the city centre of Jos metropolis using a correlation analysis. Similarly, the relationship between the location of commercial hawking and the sidewalks is to be determined. Therefore, informal commercial operator's location distances to the nearest sidewalk was measured.

Table 1.6 Frequencies of Responses to Question (iv) by Subcategory.

Sidewalk Component	Freq	%
Motorist/Vehicles	28	24.77
Overcrowding of people	17	15.04
Hawkers/Vendors	47	41.59
Lack of pedestrian sidewalk	21	18.58
Total	113	

Table 1.7 Density of informal commercial operator on to sidewalks in the city centre of Jos

Street of Study	Location Frequency	Percentage
Ahmadu Bello way	34	42.85
Rwang Pam Street	28	25.50
Murtala Muhammad way	25	18.02
Market Street	17	13.63
Total	113	100.0

Table 1.8 Results of responses from question (vi)

Yes		No		TOTAL	
Frequency	Percentage	Frequency	Percentage	Respondent	Percentage
87	76.99	16	14.15	113	100

Correlation Analysis

Bivariate correlation is a measure of the relationship between two variables. It measures the strength and direction of their relationship. The strength can range from absolute value 1 to 0. The stronger the relationship, the closer the value is to 1. Direction of the relationship can be positive or negative. Correlation generally describes the effect of two or more phenomena occurring together and therefore they are linked. Thus, analyses were used to establish a relationship between hawkers/commercial vendors and the sidewalks. This method was used by Adams N. B. et al (2015) in their study on inclusiveness in the planning of cities. The Pearson correlation coefficient is given by the following equation:

$$\text{Corel}(x, y) = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sqrt{\sum (x - \bar{x})^2 (y - \bar{y})^2}} \quad \ldots\ldots\ldots\ldots\ldots\ldots 1$$

Where $\bar{x}$ is the mean of variable x values, and $\bar{y}$ is the mean of variable y values.
Thus, the correlation analysis shows the following;

i.e. $\frac{220.56}{\sum (12)(18.38)} = \frac{220.56}{\sqrt{48{,}646.08}} = \frac{220.56}{220.56} = +1$

Fig.1

Where x = 27, and y = 21, $\bar{x}$ =9 and $\bar{y}$ = 2.62

The test shows a correlation co-efficient of +1, indicating a perfect relationship between location for workstation of informal commercial hawkers which is a spot-on pedestrian sidewalk and the customers' patronage.

Discussion of Findings

The discussion is mainly on the correlation analysis. At this point the analysis is to determine whether there is relationship between the illegal occupation of sidewalk by petty commercial vendors allow them to attract more customers to patronize their wares. The results indicate a positive correlation. This means that the illegal occupation of sidewalk would continue until when the authorities find a solution to it. In Jos the solution is whenever the Plateau State Government has reconstructed the collapsed and abandoned Jos Main Market and ensure all commercial activities including hawkers are moved into the market.

Given the above explanation thus, in general terms there should be clear alignment between sidewalks and roads. The size and scale of sidewalks must improve. Again, preferably, connectivity within sidewalks should be given a consideration at the beginning of urban planning and design efforts. This certainly ensure a well-connected sidewalk network which has several intersections and no dead ends which is characteristics mostly found in street patterns forming a grid. Such sidewalk network allows people to choose several and different paths, including the most direct path between their source and destination, allowing walking to be an efficient approach of transportation. Less

connected sidewalk networks are often found usually in some residential developments. Again, dead-end, blind alley and long-winded street patterns can make pedestrians to walk far greater distances to reach destinations that might otherwise be relatively close, often resulting in a preference for vehicle use for local trips.

Again, in terms of accessibility the planning and design of a sidewalk should accommodate the widespread range of users and serve appropriate pedestrian volumes are also central to its success. However, irrespective of sidewalk's scale, it can be designed as a multisensory environment that enhances the experience and intensifies usability. A comprehensive environment addresses not just user needs but also their preferences. People falls within a range of abilities, which change as they aged. Sidewalks must accommodate users of all ages, from children to the elderly, and with a wide range of physical and mental abilities. Some individuals may find difficulty in walking and may be livelier if they know that they will have plenty of spaces to sit and rest along the way. Young children experience sidewalks from a different perspective than adults, a particularly important consideration on routes frequently they used for walking to school. Obstructive obstacles and enhancing the various sensory indications within the three-dimensional sidewalk environment will reduce difficulties for those who are blind or have diminished vision. An appealing and inclusive design makes every user feel comfortable.

Conclusion

The study addresses the effects of the activities of urban informal commercial activities on pedestrian sidewalks along Ahmadu Bello way in Jos. It evaluates the relationship between pedestrians and the informal commercial operator on sidewalks. Again, the paper determines the relationship between the occupation by the informal commercial operator on sidewalks and patronage for the informal commercial hawkers. Thus, the study provides instruments to assist policy makers, designers, and citizens in advocating for better pedestrian experience through knowledge sharing and collaboration. It is meant to serve as a guide or reference for a variety of users. The guide should help policy makers to become aware of the specific requirements they create or adjust that might ensure, encourage, or restrict certain kinds of pedestrian experiences and opportunities for people to be physically active. It warns of the unintended consequences of the activities of urban informal commercial operators or of providing no guidance at all for the elements and factors that shape sidewalk. It asks planners to pay special attention to the quality of sidewalk design at the early stages of planning. In creating regulations that define building envelopes and their various elements, planners are informing how walkable the adjacent sidewalk will be. Finally, this study encourages urban designers, architects, and landscape architects to realize that they are designing a good portion of a sidewalk space when they decide exactly where to place their buildings, how to detail their façades to meet the sidewalk with entrances and windows, and whether to plant trees or not.

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