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EDITORIAL

The national conference of the Department of Urban and Regional Planning is biennial event which brings together members of the academia from various higher institutions of learning nationwide. In the year 2008 edition of the conference, over 38 papers were presented and thoroughly discussed by the participants. The contents of this book of proceedings are part of the papers peer reviewed and accepted for publication.

The papers presented at the conference focused on different aspects of urban security as a subject of global currency and concern. The first group of papers dwell on urban security profile with respect to the characteristics of crimes committed in cities and the culprits involved. The second group of papers focused on fire disasters as they affect lives and properties in our urban centres. Issues addressed by other papers in this edition include infrastructure security-related construction costs, urban violence and insecurity among the poor, partnership in the provision of security and slum transformation for urban security.

There is no doubt that the issues raised and discussed in the papers are of academic and policy interests. It is my hope that readers will find the information contained in this book of proceedings useful. While wishing the readers a critical moment of perusal, I encourage future participants to continue to send in their papers in order to participate in the subsequent editions of the conference

Thank you

A.M Jinadu (Ph.D, MNITP, RTP)
Editor-in-chief

MINNA METROPOLITAN URBAN STRUCTURES AND ITS VULNERABILITY TO FIRE HAZARD

Idowu Olusegun Owoeye and Musa Haruna D.
Department of Urban and Regional Planning
Federal University of Technology Minna Niger State.
E-mail: idowusegunowo@yahoo.com
E-mail:musaharray@yahoo.com

ABSTRACT

The occurrence of fire disaster in most urban centers in Nigeria is sometime traceable to the spatial arrangement or organization of space of urban landuse with reference to the location of urban structures. It is when urban landuse are satisfactorily located that an efficient urban structure can be seen. However with absence of good urban structure, cities become vulnerable to one form of risk or the other. This study is aimed at assessing Minna urban structure in terms of its vulnerability to fire hazard. The result of the study reveals the existence of excessive clustering pattern of the building and poor spacing. The organization of buildings is likely to incapacitate the fire fighters' efforts, at the time of fire incidence, for rescue operation. This study addresses the need for risk assessment, action plan and programmes of preparedness against urban fire occurrences in the Nigeria urban centers.

Keywords: Fire hazard, risk, landuse, urban vulnerability, urban structure.

1.0 Introduction

Most of the problems facing the urban centers today, especially the developing countries were as a result of the uncoordinated human activities in space. The spatial arrangement of our cities does not truly justify the existing types considering the factors for formation or the transformation of human settlement. It is quite obvious that the functions, which the city plays in terms of political or economics status, determines the rate of its development, without consideration proper planning of the city structure.

The unplanned state and decadence in the urban area and non provision of some basic amenities aggravate the threat and insecurity of the urban centers, with the attack of disasters commonly induced by human actions. The safety and security of urban environment encompasses a wide

range of issues which entails provision of basic need such as food, health and the impacts of natural disaster. The threat to safety and security of cities include crime and violence, insecurity of tenure and force eviction, and natural and human made disaster (UNHSP 2007). Hazard in an urban environment is a potentially damaging physical event, phenomenon or human activity, which causes loss of life, damage, social and economic disruption, as well as environmental degradation. It has the tendency of becoming disaster when it access in unprepared urban area.

Disaster in urban areas is experienced when life support systems fail in the face of pressure from external stress, resulting into undermining of livelihoods. The significant relationship between the spatial arrangement of urban structure, which has to do with the organization of urban landuse, with reference to location of one landuse and its interrelationship to other uses, and the occurrences of disasters with interest on the magnitudes of the disasters). UNHSP (2007) expressed that, there is a relationship between urbanization and disaster risk, with the fact that human vulnerability is not the only concern but the changes in the morphological and ecological characteristic of the urban environment.

There are quite number of disasters happening within the urban areas, especially the developing countries with the reasons of incapability and poor coordination. These include drought, flood, earthquakes, windstorms, epidemic and fire. These are the threats facing the human environment depending on the scale and the rate of losses incurred. The occurrence f fire hazard in urban cities is no more news, because of the intensity and the level of occurrences. The factors causing this mayhem cannot finally tag down to natural occurrences, but in most cases human activities. Yakubu (2006), subscribed to the occurrences of fire hazard as a factor to the technology development, in the area of the highly flammable household materials, and those of the electrical appliances. The cause of fire hazard simply cannot be confirmed to technological or industrial products but also to the action of the people who use the products. Because of human attitudes, the use of these agents can cause devastating fire disaster.

However, the spreading of urban fire hazard is subjects to the arrangement of landuse within the urban setting, given the fact that, planning standards and development control is not strictly adhere to. It is saddened to say that the residential and commercial landuse are prone to fire hazard in our urban center. The problems of fire hazard with the residential neighbourhood, in most cases are due to the inadequate planning and proper development control of existing buildings. The unplanned areas however experienced more incident of fire disaster due to its clustered nature of development compared to the planned areas.

In case of the commercial centers, fire disasters are caused by the nature of appliances that are used. This includes substandard electrical cables, not the inefficiency of the controlling body (PHCN) as well as the poor orientation of people in managing energy. The failure of the action

mentioned above could contribute to most factors leading to fire incidence within commercial areas. Other factors could be poor methods of fire disaster management.

Often, when fire disaster happens, government distributes materials and even pay hospital bill for those who suffer from the disaster. Planning for disaster does not necessarily mean waiting for the disaster to occur before the need for how to avoid it in the subsequent time, but by understudying its likely factors: physical social, economic and environmental that have the tendency of causing the disaster. By such this safer city would be ensured.

In building a safe and jut city, there is need for the exploration of a system, which has the capacity of harmonizing the agents of fire hazard with the rate of development. This is what is been referred to as disaster preparedness.

Vulnerability assessment is a relative tool for hazard prevention or mitigation; it is also regarded as threat and risk assessment, which solely relies in the identification of the likely hazard with the intending effects on social, economic and physical activities of an urban area. The concept of this system against fire hazard in any area is to have the information on the resilience and susceptibility of the spatial structures within an urban area, and use the data to build a database on the risk area for serious warning to the people.

Based on the assertion that 'a safe city is a just city, in realization one of the focus of the millennium development goals, a free and sustainable urban environment must be pursued, through, disaster preparedness strategies plan for the urban environment, a to give an early warning, where the disaster could not be avoided. The fact is that urban planning and development are not backed with disaster risk reduction and early warning system relative to the occurrences of fire hazard in most of Nigerian urban centers.

This study aimed at assessing the density structure of Minna metropolitan area and its vulnerability to fire hazard. The objectives are to assess the density of physical development within the metropolitan area vis-à-vis the planning standards for space development and the risk mitigation; and to examine the susceptibility of these physical development to fire hazard occurrences.

2.0 The Study Area

Minna, the capital Niger State, is located on latitude $9^0\,45'$ North and longitude $6^0\,39'$ East. It is bounded by the Federal Capital Territory (FCT) Abuja of about 135km distance. The

transformation of the city started since the era of railway construction in 1905, the inauguration of judiciary system of city governance (appointing a chief judge; alkali) was another point of reference, also the construction of prison. The movement of the indigenous settlers of minna from the uphill to the present town centre in 1910. The federal government declaration in 1976 proclaimed Minna the capital of Niger State.

The coverage of the build-up area of Minna had not been static since the declaration as state capital, in 1976. From a size of 884 hectares, it expanded to 5, 335 hectares in 1983, and 7,070 in 1993. The extent in land coverage increased by 30% between 1979 and 1983, while the increase was as low as 2.9% between 1983 and 1993. The population of Minna as at 1979 stood at 76,480 while the census 1991 revealed it as 143,896 with the annual growth rate 7.9% far beyond the national growth rate 2.83% of 1991. The change in population shows the need for space, which invariably result to the expansion of land coverage by development.

3.0 Research Methodology

In generating the empirical data for this research work, questionnaire were structured and administered to obtain the primary data from the residents on the issue of fire disaster occurrences in Minna metropolitan area. The secondary data for this study were sourced from the available printed materials such as, textbooks, journals, research projects, conference papers and the dailies.

Sampling method was used within frame size of the existing physical development which comprises of the residential, commercial and public semi public buildings. Stratified random sampling method was used based on the wards delineation where the population was drawn from individual strata. The study only considered the high density areas like Minna central, Mekera, Sabongari, and Nassarawa.

4.0 Data Analysis and Discussion Of Results

4.1 Minna Urban Structure

The metropolitan area in Minna is characterized by intense development of space available within the area. The study shows that, the area is densely populated and mostly clustered with buildings and less open space. The pattern of landuse in the study area shows that the uses are basically characterized by residential, commercial, mixed landuse (commercial and residential) and semi public landuse (table 1).

Table1: Exist Landuse within the District in the Study Area

Landuse Pattern	Minna Central		Makera		Sabongari		Nassarawa	
	Freq	%	Freq	%	Freq	%	Freq	%
Residential	72	48	79	52	75	50	105	70
Commercial	39	26	52	34.7	37	25.3	33	22
Mixed	31	20.7	15	10	35	23.3	15	10
Public/semi public	8	5.3	4	4.3	3	2	12	8
Total	150	100	150	100	150	100	150	100

Source: Field survey 2008

Field analysis reveals (table 1) the predominant landuse pattern in Minna metropolitan area. The result, according to the districts under study, shows that; Minna Central area was dominated by residential landuse (48%), commercial landuse constitute 26%, mixed landuse 20.7% and 5.3% for public land or semi public use. In Makera area, residential landuse constituted 52%, commercial 34.7%, mixed 10while the public/semi public uses make up 4.3%. In Sabongari district, 50% of the land was for residential, 25.3% for mixed uses while 2% is for public or semi public. In Nassarawa South, 70% of the land was used for residential, 22% for commercial, 10% for mixed uses while 8% was for public or semi public use.

The study reveals that, considerable coverage of the land use in the metropolitan area of Minna is for residential purpose, while commercial activities as well dominated the area. However, the mixed uses of buildings for commercial and residential areas were more glaring in the district. There are few public/semi public landuse in the areas.

Development of the structure in the area shows that planning rules and standards of building were not strictly obeyed in such cases like:

(a) Internal arrangement of all the buildings with relation to close proximity of one building to another, the buildings setback to roads was highly inadequate in the area of research.

(b) The change in the use of buildings: there is a significant change in the purpose of buildings, The residential dominated area no longer serve the singular purpose, but now mixed with another type of uses such as commercial and light industry.

(c) The opens spaces in the area are no longer available as they had been converted to serve another uses.

(d) There is the problem of accessibility from one street to another with respect to the size and condition of the roads. Areas like Sabongari and Minna central were more in capacity and intensity of this kind of problems.

(e) One other major menace in these areas is the on-street trading pattern which has become a major problem along the major secondary arterial roads in the city. Traders have extended their tables and products beyond the boundary of their shops. So also is the problem of under-age children hawking in most parts of the city.

Considering the planning standards and development in the study area, this involves the zoning pattern of the metropolitan area of Minna and the governing rules for development. The study reveals that some major site are zone predominately for residential while from the ministry there are rules and procedure for change in the use of property. The outcome of the survey shows that the procedures for conversion of use of property were not follows by the people while developing such activities, so also, the enforcement of such rules in the city are ineffective by the government agencies in-charged and opens the areas to the tendency of hazard.

4.2 Risk and Vulnerability Assessment

Fire hazard assessment (FHA) would require set of conditions which characterized the building's relationship with one another or arrangement in space. This may contribute significantly to the risk reduction in areas. The indicators for FHA include, types of building, number of rooms/buildings, materials component of the building, spacing and in these area.

Table 2 reveals that, 32% of the buildings in Minna central served tenement purpose, 53% compound, 4% storey buildings, while 11% were block of flats. In Makera, 37% were for tenement 23% compound, 9% storey and 11% were block of flats. In Sabongari, 43% of tenement 49% were compound, 8% storey building and 12% were block of flats.

The analysis implies that compound and tenement buildings constitute 41.3% and 35.5% of the types of buildings respectively given the total types of this building as 76.8% of the total buildings in the metropolitan area of Minna. Invariably from this discussion; the two prominent types of building gave the highest number of rooms which ranges from 5-10 or 10-20 rooms. The major common materials for building in these areas are local bricks.

Spacing and set backs from one house to another is of a great concern to the occurrence of disaster in different district. The study on condition of building in term of its arrangement vividly shows that, the movements within study area wee through footpaths, as the place was

inaccessible for vehicle, where it may range between 50m – 75m distance to the main roads. With the grid pattern of road network in some of the streets, it was observed that the roads were either dilapidated or too narrow for parking and movement of vehicle through and within the area.

Table2: Existing types of building

Types of building	Minna central		Makera		Sabongari		Nassarawa		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Tenement	48	32.0	55	36.7	64	42.7	46	30.7	213	35.5
Compound	80	53.4	35	23.3	59	39.3	74	49.3	248	41.3
Storey	6	4	13	8.7	6	4	12	8	37	6.2
Total	150	100	150	100	150	100	150	100	150	100

Source: Field survey 2008

4.3 Public facilities for fire Fighting

This part assesses the consciousness of the people living in the area with respect to the importance of the infrastructure for fire fighting located in the area. Among the facilities considered are water hydrants and fire extinguisher (table 3). The study reveals that the level of functionality is low.

Table3: The Existing water Hydrant Points in Minna Metropolis

S/NO	Hydrants point	Area located	Pressure	Functionary
1	Fire status	Fore station along Bosso	3-4 bar p	Functional
2	Mobil	Opposite general hospital, hospital road	3-4 bar p	Non functional
3	NEPA	Beside U.K Bello Art Theatre	3-4 bar p	Functional
4	Stadium	Stadium junction, Bosso road	2-4 bar p	Non functional
5	Kwangila	Kwangila junction, hospital	2-3 bar p	Non functional
6	Paiko road	Opposite Zenith Bank	1-2 bar p	Non functional
7	Shiroro	Along NEPA road	2-3 bar p	Non functional
8	Market	Awari market	1-2 bar p	Non functional
9	CBN	Erena road	1-2 bar p	Non functional

Source: Ibrahim R. M. 2007.

5.0 Summary Findings

The finding of this survey shows that the districts understudy within metropolitan area of Minna consists of high density of buildings that are majorly residential in nature. Presently the commercial activities has crept into these residential zones making some buildings to give way for new use or sharing the purpose of use. As a result of the intensity of the physical development in these districts, accessibility or movement of people in the areas has been affected for

The finding shows that the buildings are compacted together with little or no space in between. This indicates that planning laws were not in operation in the city to ensure orderliness for building development. The agencies of government are seen as "toothless bull dog" to the challenges and responsibility of monitoring the development.

With regards to the nature of spatial arrangements and the system of development in the districts, the findings shows high risk of the buildings to fire hazard in the city. The spreading of inferno is possible as no measure has been put in place to checkmate the sporadic development in the inner core of the city.

Looking at the preparedness level of the city to such fire incidence, and the machinery put in place (fire fighting equipments, both human and materials) is inadequate. Evidently, less attention of the government centre on the challenges and reduction of such risk occurrences. Seven out of nine of the water hydrant points are non functional, meaning that only two of the hydrants are working. The personnel to handle such incidence are being faced with lack of necessary and functional equipments for the task. The understanding of the people on the risk reduction or mitigation is very poor in the city. The finding reveals that the risk of fire hazard is not only on the residential buildings but the tendency of spreading to the public buildings. This raises a question on the level preparation of public buildings to prevent fire hazard.

6.0 Conclusion

In conclusion, it is noted that the problem of fire hazard within the residential neighbourhood in most cities in Nigeria are complicated by the pattern of existing urban structure result from undermined planning and uncontrolled development. The unplanned areas however experienced more incident of fire disaster due to congestion or high density of buildings. Since safety and security of urban environment encompasses a wide range of concern issues it is necessary for urban planners to implement planning standards and strengthen the effort towards effective development control for sustainable fire hazard reduction in the urban centers. The machinery for fighting fire should not be neglected by the authority. Both human and material resources must be properly channel to the protection of lives and property.

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