SEASONAL INCESSANT FIRE OUTBREAKS IN ANAMBRA STATE; A CASE FOR CONCERN: TOWN PLANNERS VIEW

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ABSTRACT
Fire outbreaks are reported in cities across various parts of the world including states in Nigeria mostly between November and March of every year. Such fires or infernos are known to engulf markets, shops, homes, vehicles, among others; and despite efforts by public fire-fighting agencies, Federal and State Emergency Management Agencies and other stakeholders, much successes have not been recorded. Fire incidents, whether reported in the media or not, result from bush burning, faulty electrical connections, crass negligence, and carelessness, and often lead to disastrous loss of lives, livelihood, homes, and properties. Improper physical planning can aid the menace as seen in cities across Nigeria including Anambra State. Onitsha in Anambra State has recorded the worst fire outbreaks in Southeastern Nigeria in recent times. In a city with high population and building density; man-made disasters and urban fire outbreak remain major threats to Anambra State, Nigeria. However, the design of built Environment greatly affects its performance in providing livable spaces for its users. This paper proposed an approach to improve on curbing fire outbreaks in Anambra State through urban design. The study depended on interviews of residents and government officials to obtain background information on the occurrence and causes of fire accidents, policy provisions and regulations, and experiences with fire outbreaks and coping strategies, as well as an observations of some affected areas. A good environmental design can lower urban fire susceptibility, support mitigation efforts and increase disaster preparedness, and make a large difference in the response to an Emergency situation. Bearing in mind that awareness against urban fires must be raised as the physical environment is unit at a time, and a challenge in part(s) can affect the whole.

INTRODUCTION

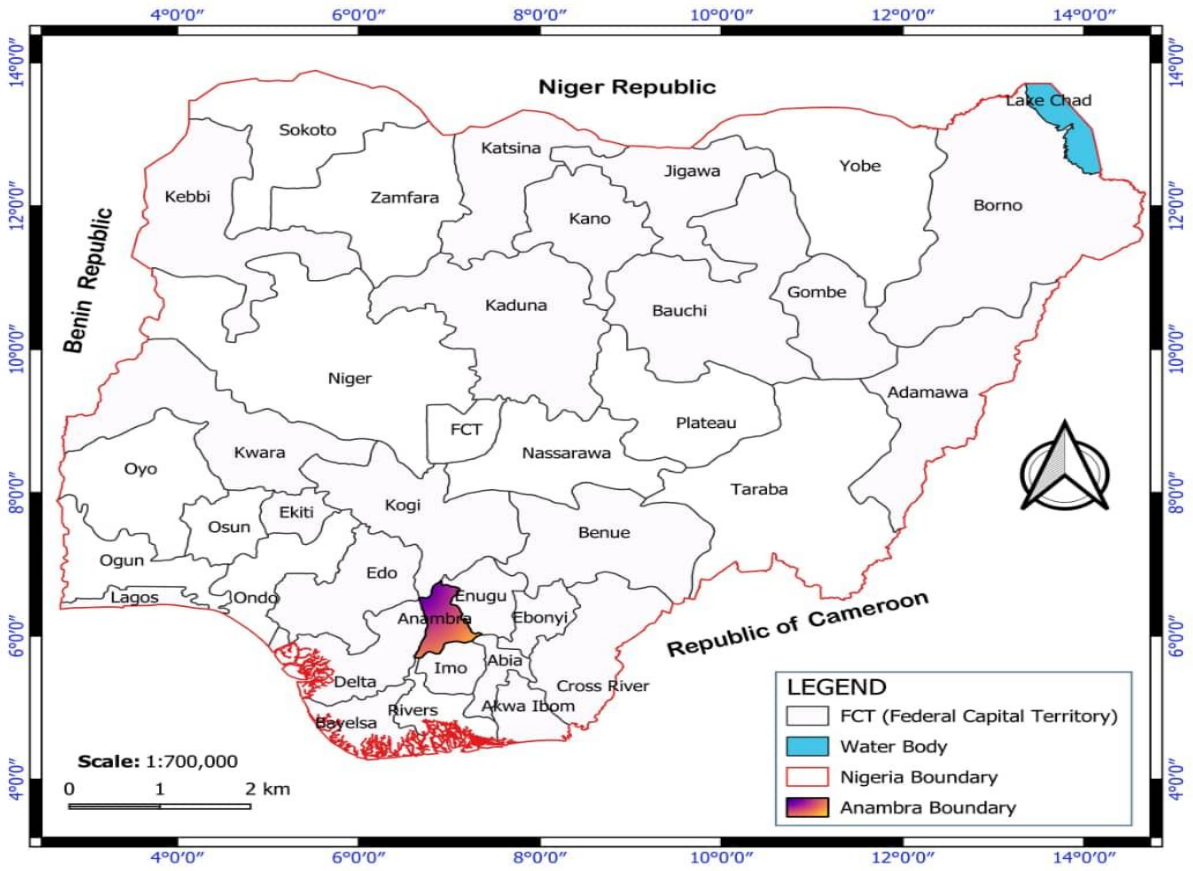
Fire outbreaks are global problem that are not only devastating but have left the victims in sorry state and have killed some. Across the world there are records of different incidences of fire outbreaks. According to the study by Nyongesa and Vacik (2019) in Kenya; fire records from 1980 to 2017 show that Mount Kenya Forest Reserve and National Park experienced about 210 wildfires. Fire is identified to be one of the major deforestations causes in Tanzania (Mgina and Wawa 2020). According to Oloke et al (2022), Fire outbreaks emanate from various sources though Vehicle/tanker accidents rank highest as source of urban fire. In recent times, fire outbreaks in Nigeria have been surprising, unplanned and often poorly coordinated (This day news, 3/7/2020). Consequently, the incidents have become so bad and compounded, that the impact of such disasters on affected persons are grave. Some states in Nigeria do not have effective and functional fire service stations and those that have are not evenly distributed across their territories (This day news, 3/7/2020). This no doubt has led to many unintended disasters. Typical example is the tanker fire at Ochanja Market, Onitsha, Anambra State in December 2021, that razed over 500 lock-up shops, an incident that caught the Anambra State fire service unprepared to intervene (This day news, 3/7/2020). That amount of damages were done easily because the shops were poorly planned and built coupled with poor performance from the State Fire Services. Immediately the fire connected to one it spread easily to the rest. It took the effort of firemen from Delta State Fire Service that were drafted to put out the fire. That was sad commentary. Equally appalling was a heroic video of a man with a bucket trying to extinguish huge blaze on the roof of a five-storey building in Balogun market, Lagos (This day news, 3/7/2020). This clearly depicts lack of

preparedness by Federal and State Fire Services to manage the incidents of fire outbreaks in the country.

Uncontrolled fire remains one of the major causes of death and property damage in today's society (Poerbo, 1998; Schneid and Collins, 2001). Some of the well-known urban fires are the Chicago, Boston, and Baltimore fires that occurred in 1871, 1872, and 1904 respectively (Rosen, 1986). A fire outbreaks in a densely populated urban area can easily propagate to adjacent buildings one after another. Fire occurrences are responsible for extensive damage on the urban environment and the cause of numerous deaths (Himoto and Tanaka, 2008). There have been records of fire incidences across the globe, Nigeria and Anambra in particular. Most of these fire incidences have rendered good number of people homeless, destroy properties worth millions of naira, causes serious damages to life. On constant basis, it seems as if these incidences are defiling solutions. This is engineered by the fact that most towns in Anambra State are growing organically. This is as a result of lack of developmental scheme in most of the towns and those with schemes have been distorted for political reason or the other, thus creating serious Environmental challenges. Notwithstanding the damages and colossal loss recorded in the Environment whenever it occurs, no Town Planner (as one of the major actors of the Environment) has tried addressing this issue as it affects Anambra State. Town Planners view on disturbing issue like this is necessary because, they are saddled with the responsibility of ordering the use of land for maximum comfort and security. Meaning that their view will help in government formulation of policy as it affect the Environment and for academic research purposes. It will equally guide developers, the general public and individual in decision making process.

THE STUDY AREA

The study area of this research is Anambra State. It is located in the southeastern region of the Nigeria. It is situated on latitude 50321 and 60451N and Longitude 60431 and 70221 E respectively. Anambra State was created out of the former East-Central State in 1976 and consisted of the present day Anambra State, Enugu State and some part of Ebonyi State. However, the State saw its landmass and geographical territory reduced in August 1991 following the removal of Enugu State and Ebonyi State from it. It was this creation that gave birth to the Old and New Anambra State concept. Prior to 1991, the State has its Capital Territory and seat of government at Enugu, but in this era of post-Enugu-Ebonyi excise from the State, the State's Capital Territory and seat of government is delineated to Awka.



Map of Nigeria Showing Anambra State (the study area).

The State derived its name from its river (Omambala River) which is a tributary of the famous River Niger and has Awka, Ontisha, Nnewi, Nkpor, Odekpe, Ogbunike and Ekwulobia as its biggest commercial and industrial cities following the residence of large markets within these respective areas. The State is bounded by Edo and Delta States to the West; Imo, Abia and Rivers States to the South; Kogi State to the North; and Enugu State to the East. Anambra State with an estimated population of 5,953,517 persons (National Population Commission 2020). The cities of Onitsha, Nnewi and Ekwulobia from pre-colonial era, remains an important centres of commerce in the State. This has led massive movement of people to the area from different parts of the country thereby creating unimaginable urbanization in the state,

Literature Review

Oloke *et al (*2021) examined the level of fire risk exposure in Ibadan and the adequacy of community fire safety measures. The study showed that the study area is highly vulnerable to all kind of environmental hazards prominent among which is fire hazards, yet, the communities are ill prepared to prevent or curtail the incidence in case it occurs. The study showed that most fire incidence that have occurred in the communities were caused by human actions, inaction or activities. The study therefore concludes by recommending that the State and Local Governments need to improve the level of community preparedness against fire outbreak by providing adequate community fire safety apparatus. Moreover, there is need to enlighten the residents on fire safety, prevention and management strategies which is believed to go a long way to assisting the communities build a strong and permanent firefighting mechanism in the study area. Efforts geared towards implementing the recommendations of the study go a long way to achieving laudable milestones in the areas of goals, i.e. making cities and human settlements inclusive, safe, resilient and sustainable.

Agbonkhese et al (2017) examined the incidence of fire outbreak in urban areas and the control approach in Gombe metropolis. Factors hindering fire management efforts were identified. Primary data was obtained with the aids of questionnaires administered on 250 residents of the study area. More information was further obtained via interviews, focus group discussions, direct observation and review of documents of the state fire service. A five-point likert scale was used to determine the least and most significant causal factor. Findings shows that negligence constitutes the most significant causal factor of fire incidence in the study area while electrical fault was the least. It was further revealed that majority of residential buildings in the study area lack functional fire extinguisher while those that have could not operate it. Inadequate firefighting gadgets, personnel and lack of access in highly inhabited areas of the metropolis during fire outbreak were highlighted. The study suggested amongst others, the effective and credible monitoring and surveillance system for the distribution of fuel in the country, public enlightenment on fire safety and precaution through print and electronic media, provision of community based fire-fighting gadgets as well as development of plans and strategies to prevent fire outbreaks.

Adekunle et al (2018) analyzed fire outbreaks in residences and municipal buildings in Lagos State, Nigeria. Data on fatal fire outbreaks in Lagos metropolis between 2009 and 2014 were obtained from the Lagos State Fire and Safety Services, National Emergency Management Agency, Nigeria Security and Civil Defense Corps and Ministry of the Environment, Health Monitoring Unit. Structure questionnaires were administered to 2000 residents of Lagos State between the ages of 18 and 79 years. Interviews were also conducted alongside the structured questionnaires. Basic descriptive tools engaged in the analysis of data for the research include frequency, percentages and mean while results of data analysis were presented in bar chart, tables and pie chart. Findings revealed amongst others that most fatal fires in homes often start in a bed,

sofa, other loose fittings or clothing in rooms that are rarely protected by smoke detectors. Also, fatalities are higher among males and elderly than females and younger people. The study further revealed that negligence and arson are the commonest causes of fire outbreak in homes and public buildings. The study recommended amongst others, enlightenment of users and occupiers of building on fire safety precautions, installation of automatic fire prevention gadgets at high risk areas in the building, preparedness and prompt response of fire brigade to incidence of fire outbreaks.

Dirisu et al (2019) examined the performance assessment of the firefighting personal protective tunics in Nigeria. The study was prompted by the reports of substandard firefighting kits and dearth of research into materials used for firefighting tunics in developing countries, particularly in Nigeria. The loss of lives and property during fire outbreaks in the country have been attributed on different occasions to the use of inferior gear. Hence the need to examine the performance assessment for those kits available in Nigeria. This would also ensure the safety of lives of the firefighters and enable them deploys their skill to execute the task to the best of their ability. The study was set in Ota due to the level of industrialization and growing population. Ota has only one fire station where the sample was obtained. The apparatus used for the experiment include thermometer, copper calorimeter, Bunsen burner, 250ml beaker, thread, electric beam balance, wire gauze with ring and ring stand as well as automatic Lee‟s disc apparatus. The study revealed that the standard of tunic being used in Nigeria fire stations is below the acceptable general standard. It was therefore suggested that fire stations in Nigeria are to be equipped with standard of PPEs so as to adequately protect against loss of lives of the personnel.

Alao et al (2020) investigated fire safety and deterrence approach in office buildings in Nigeria. Extant literatures on this subject were reviewed to explain fire risk in office buildings. Physical

inspection was conducted on selected high and low-rise offices to ascertain the fire safety measures incorporated in the building. Interview was also conducted with professionals in the field of Architecture, Building Technology, Building or Estate Manager, Engineers and fire safety directors for their perspectives on fire safety practices in office buildings in Nigeria. Information on the location, spread and number of floors of office buildings in the north-central regions were obtained from the records of urban development control and planning department of each state. A checklist of both active and passive fire safety requirements for high-rise office buildings were compiled from the Nigeria National Building code (NNBC, 2006); National Fire Protection Association (NFPA, 2018) and National Fire Safety Code (NFSC, 2013). The fire safety requirements identified include muster points, exit stairs, fire access, distance to safety, emergency lightening, fire alarm, fire extinguisher, exit signage, fire men access and artificial lightening. Due to the multiplicity of the fire safety systems, a multi-attribute evaluation model was adopted in determining the fire safety performance of each building. Ordinal scales that demonstrate the grade levels X, Y and Z were used to classify the performance of each building. Analysis was basically in frequency and percentage and presented in tables and bar charts. Findings showed amongst others that 67% of buildings surveyed make adequate provisions for fire extinguisher only amongst other safety measures while above 67% are inadequately prepared in the aspect of the remaining fire safety measures. The study also revealed that 67% of the buildings lack place of safety and escape stairs. It further showed that the buildings lack critical fire safety systems. The study suggested that adequate provision of places of safety and firefighting equipment to aide quick intervention in case of emergency.

Wahab (2015) noted that in a built up environment, preventing fire accidents totally can be very costly or even unattainable. That makes it a very big task to engage in, most especially in

environment like Anambra state where planning is generally carried out in piecemeal. Nevertheless, Shokouhi et al (2019) stressed that over 75% of fire outbreaks are avoidable. Consequently, necessary measures to prevent the incidence of fire in the buildings and in the neighbourhoods must be betrothed to arrest the menace. Agreeing to Adebayo, (2018), the attitude and vulnerability of the residents, reduction of inflammatory tendencies of products, design/structural safety and quick response of the fire services are vital areas to consider for a city to be fully secured from fire. The rapidly increasing population of many urban and peri-urban settlements in developing countries which has led to an uncontrolled expansion of these neighbourhoods in terms of development of different kinds of properties necessitated the review of the level of exposure to fire disaster and an assessment of the resident's compliance with fire safety requirements in building development (Okeke 2022). Oloke (2021) stated that the issues of environmental risk, disaster, exposure and vulnerability of neighbourhoods have gained prominence in recent discourse among policy makers, stakeholders and the public. This has necessitated a discourse on disaster management and design approaches to curb disaster from occurring.

Disaster Management and Environmental Design

Disasters could be human-made which results from human errors and include industrial explosions or structure failure and Natural disasters resulting from physical phenomena and include earthquakes and drought etc. To manage Disaster means a process of efficiently preparing/planning for and responding to disaster. It comprises deliberately organizing resources to lessen the harm that disasters can cause. It can similarly be a methodical approach to handling the responsibilities of disaster prevention, preparedness, response and recovery. Disaster Management or Emergency Management is understood as a set of inter-connected activities to

reduce risk and describing post-disaster strategies towards recovery (Ali and Novogradec, 2008, Dahl, 2011, Khan et al., 2008, Navitas, 2013). The approach includes strategies and activities during the following stages of a disaster or an emergency situation:

Pre-disaster (mitigation and disaster preparedness) – though mitigation and preparedness look similar, mitigation relates to activities or measures in evading a disaster, or minimizing the damage it causes. Preparedness, on the other hand, contains all activities and measures in case a disaster strikes. That means taken appropriate steps when the fire disaster has not occurred. This is where none of the authors has addressed. Getting the problem of fire incidences solved before fire problems emanate is very necessary if we must get it right. Overlooking, this point makes the city to run a risky of being destroyed or devastated by fire.

During a disaster (response) – this has to do with measures taken during the course of a disaster, or directly after it strikes. The actions here are meant at plummeting casualties and prevent further damages. This has to be instantaneous and pungent to relief the survivors of impacts of the fire disaster. This needs smart accuracy to achieve result or be counted as part of the victims.

Post-disaster (recovery) – once a disaster has seized to occur, efforts to repair the damages and restore the environment to its pre-disaster state can take place. This stage is also known as the 'bounce back 'stage. Before now many damages must have been done with a lot of casualties depending on the scale of the disaster. Getting result here is usually very expensive as repairs most often usually take more or close to what was used to build.

The activities contained in the stages above are inter-connected to form a cycle because involvements from each stage develop contribution to prepare for further disasters. Documented response involvements will provide valuable input for better mitigation and preparedness which in turn will result in better response.

Methodology

We adopted a case study strategy to examine fire risk in Anambra State because this issue is contemporary and evolving and requires a rich information case. We undertook a variety of both qualitative and quantitative approaches:

Focus group discussions and stakeholders' meetings at the beginning of the study to construct an overview of issues related to fire hazards and risk at different levels and to identify data availability. Those involved are General Manager Anambra State Physical Planning Board, Director/Fire Chief, Anambra State Command, selected Town Union Heads, some Market leaders, selected Executive Secretaries of Anambra State Physical Planning Board, Managing Director Awka Capital Territory Development Authority, Director Ministry of Lands, Survey and Town Planning Anambra State.

Open-ended questionnaire to provide information about ownership and tenure, experiences with fire outbreaks, emotional, social and economic impacts suffered and measures taken by the family to prevent or cope with fire outbreaks.

Literature review to unearth important concepts, including views across the globe, to guide the study and confirm evidence from other sources.

Measurements of physical aspects such as functional spaces in houses and widths of streets and passages, which support our analysis of space use and recommendations for improving road access, designs and arrangement of many land uses. Observations on the extent of house extensions blocking access roads, government attitudes to planning, participants measure to fire risk and community awareness. This was adopted and reviewed from (Sekizawa 2005).

Anambra State is prone to other natural disasters such as floods and erosion but the rate fire is wreaking havoc in the State is disheartening (Okwu-Delunzu et al 2017). The structural processes that accelerate urbanization expose the city to man-made disasters such as urban fires. The Anambra State Fire Service (ASFS) has recorded over 700 cases of fire incidences between 2016 and 2021, claiming 33 lives, injuring 18 people, and damaging properties worth hundreds of millions of naira. From the recorded incidences, the fire outbreaks are seasonal; ravaging mostly in harmattan season (between December and February) yearly (ASFS, 2022).

SUMMARY OF FIRE STATISTICS IN ANAMBRA STATE (JANUARY 2016 – DECEMBER 2021)

		2016	2017	2018	2019	2020	2021	**Total**	DEATHS	INJURY
1	JAN	35	28	35	21	32	18	**169**	2	2
3	FEB	5	30	9	14	40	14	**112**	3	2,1
	MAR	3	3	10	10	12	4	**42**	0	0
4	APR	2	3	5	6	8	10	**34**	0	2
5	MAY	14	5	8	1	10	5	**43**	0	1,2
6	JUN	8	2	7	4	5	4	**30**	0	0
7	JUL	6	1	4	8	12	6	**37**	0	0
8	AUG	6	2	1	10	6	5	**30**	5	1
9	SEP	6	-	1	2	1	11	**21**	0	0
10	OCT	4	4	1	4	3	5	**21**	6	0
11	NOV	8	1	5	11	8	8	**41**	2	1
12	DEC	20	13	24	32	7	24	**120**	15	5,1
	TOTAL	**117**	**92**	**110**	**123**	**144**	**114**	**700**		
	DEATHS		5		11	2	15		**33**	
	INJURY	8	1	2	1	1	5			**18**

Source: (Anambra State Fire Service 2022)

Seasonal fire outbreak is a problem in Nigeria and it has led to loss of lives and destruction of properties (Nigerian Fire Service, 2016). Throughout the country they are number of recorded fire incidences but that of Anambra State is disturbing giving that the State is commercial hub with concentration of buildings in the State and the outcomes have been disturbing and had failed several attempts of the government. According to the records of Anambra State Fire Service, as shown in the table above, fire outbreaks in Anambra State is frequently occurring across the State

seasonally. Giving consideration to these fire outbreaks in Anambra State Nigeria, and many attempts in the past that have had little or no results, it is therefore important to try a different approach that can proffer solutions to seasonal fire outbreaks in Anambra State Nigeria. Thus, the need for an approach to curb fire outbreaks in Anambra State through Urban design.

DISCUSSION OF RESULTS

The basic intent of urban design is creating places (Carnnona and Tiesdell 2007). With numerous contributing factors, Thwiates et al (2007) believe that a successful urban place is much more a miracle than a goal. Environmental quality is the basic goal of urban design. It is also major deciding factor of the success of urban design (Cai and Wang 2009). Public safety is the major factor in determining environmental quality. An urban environment may not be considered a successfully designed space if it cannot guarantee its users safety despite being aesthetically pleasing. Therefore they are three opportunities in which environmental design can normatively and creatively intervene in the disaster risk management vis-a-vis fire incidences in urban area.

Mitigation: As noted by many scholars that since fire usually propagates into convection, combustion and thermal radiation (Himoto and Tanaka 2008, Ramli 2010, Schroll 2006) the design of environment should allow some distance between structures or have a fire-resistant structures erected between them. Proper spacing of shops within blocs with regulated setbacks must be maintained. Having routes for vehicles on special duties is necessary. Alternatively, opening up all access roads (road verge) on all the major roads in the State. All development must be within approved layouts to enable planning scheme guide them. Conduit wiring with good quality materials and must be done by experts. On-street trading should be stopped forthwith. There should be sound policy allotting timing for heavy trucks movement within the state.

Preparedness: Having clearly designed escape routes, informative signage will be very helpful for residents of dense urban settings like Onitsha, Nnewi, Awka and Ekwulobia. Fire hydrates posts should be available throughout vulnerable areas such as markets, hotels, event centers etc. to ensure fire availability and fire engine reach. Treated (none-oxygen) boreholes to be situated at strategic positions with overhead tanks well positioned at different places.

Response: Improve routes on which people and vehicle circulate. Paths and lanes should be physically able to accommodate the width, length and maneuverability of fire fighting vehicles. Government should partner with private sectors on fire disaster control. The cost of quenching the fire will be on whoever causes the fire outbreaks.

Narrow alleys and dense built up area characterize the Anambra environment. Most of the towns and cities do not have access road and the ones that have are not good access roads. A fire outbreak can cause extensive damage, in short amount of time (Sufianto and Green 2012) spatial plans and strategic management documents exist as non-structural instrument of mitigation thus already covering urban safety aspects (Cai and Wang 2009).

Slant of the proposal

The proposed design approach uses a design atmosphere to describe the interaction between environmental design components and safety-based urban design principles. They should be free traffic corridors for essential duties out of the multiple corridors. This will help in fast-tracking emergency management units.

Private sector should be allowed to handle or partner with the government on the management of fire services. This no doubt will bring competition on the sector thus efficiency and effectiveness of the sector. They should be penalties on the defaulters.

Fire hydrates posts should be available throughout vulnerable areas such as markets, hotels, event centers etc. This will help to discourage fire availability and fire engine reach in case of outbreak. Treated boreholes at strategic positions with overhead tanks well positioned at different places.

Conclusion

Firefighting incidences in Anambra State have been astonishing, unplanned and often poorly coordinated so much that it could be so bad and often compounded the impact of disasters on persons affected. Some states in Nigeria do not have effective and functional fire service stations and those that have are not evenly distributed across their territories. The proposed design setting serves as an environmental appraisal tool for urban designers and decision makers. Good environmental design can improve resilience by intervening in all stages of an emergency situation. It can support mitigation efforts, while simultaneously increasing disaster preparedness. Environmental design can also make a difference in responding to an emergency situation. A complete renewal of the existing built environment, is possible but the associated costs of doing so have made it impossible due to numerous man insatiable quest to better his life. Consciousness in contradiction of urban fires must continue to be indorsed as the physical environment is formed or altered one component at a time.

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