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THE ROLE OF THE INSURANCE INDUSTRY IN MANAGING EMERGENCY RISKS IN REAL ESTATE INDUSTRY IN NIGERIA

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ABSTRACT

This study explores the role of the insurance industry in managing emergency risks associated with the real estate industry in Nigeria. It seems that inadequate awareness of the importance of modern insurance industry in an economy has negated this crucial risk transfer mechanism that can assist in stabilizing and promoting good living among Nigerians. Cases of fire and building collapse in causing deaths, bodily injuries and property losses abound and should be addressed. This paper, examines the role of Insurance industry in managing such emergency risks. The expertise of content study is adopted. The study concludes that the real estate industry in Nigeria is truly in a state of emergency and the insurance industry need to contribute her takes in preserving the patrimony of the nation. The study recommends among other things the introduction of Emergency Clause in fire insurance policies by insurers and also re-emphasizes the need for Architects and Real Estate Managers to take the issue of crowd management as a priority in building design.

Keywords: Disaster, Emergency Management, Emergency risk, Hazards, Real Estate, risk transfer

1.0 INTRODUCTION

Nigeria is experiencing rapid urbanization, with an estimated annual national population growth rate of just over 2% and an annual urban population growth rate of about 4%. The population is becoming more and more focused on the urban areas, towns and cities with just under 50% of the population living in urban areas — and this number will continue to grow. This is one of the factors responsible for the viability of the real estate industry. According to PricewaterhouseCoopers (PwC), Nigeria's real estate industry value is $13.65 Billion. This is a clear indication that Nigeria real estate industry is very viable. An industry with such a prospect is crucial to economic growth (Emiedafe, 2015).

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The real estate industry is the fifth-largest contributor to the Nigerian economy and a potential goldmine for investors; but as the Nigerian economy grew, the real estate industry's contribution to GDP dwindled. Experts have attributed this to the restrictions placed on the availability of foreign exchange that affected the construction industry, which is heavily import based, and the unstable economic climate which has affected the general willingness to invest in the country's real estate sector. The sector ended 2017 with a -5.92% contribution to the country's GDP; a significant drop from the -3.1% recorded in the 1st quarter (Dimeji-Ajayi, 2018)

Not minding the importance of the sector to address the obvious housing deficit in Nigeria, a number of emergency risks are intimidating factors retarding this enviable contribution of the sector. Cases of a collapsed building in different parts of Nigeria abound. The collapse of a building is a clear manifestation of emergency risk unpredicted, unexpected, unplanned fortuitous events. From 1974 – 2010 as a result of over 60 building collapse in Nigeria, 401 people have died and several more haven't been reported or accounted for (Emiedafe, 2015). The nation is not given to major natural disasters as evidenced in some other nations. This blessing seems to have induced culture of sheer negligence among Nigerians, which are manifest in rampant man-made infrastructural disasters.

The consequences of several extreme events such as natural disasters and terrorist attacks have raised further awareness of the importance of building design to factor in safety and security. Minimizing the impacts of emergencies is not limited to minimizing the damage to the physical structure of the buildings, the safety of building occupants is the most vital point. According to Kecklund, Andrée, Bengtson, Willander, and Sire (2012) safe building design need to consider requirements and the cognitive abilities of occupants as it relates to vision, sound, heat and hepatic sense because it is highly dependent on characteristics of the users and their interaction with the building. Even the occupants with special needs should be considered during building and evacuation (Koo, Kim, & Christensen, 2013).

Within this context, the management of building occupants, sheltering and evacuation during emergency events are important. It is important to consider the design process as a whole to ensure a safe and secure building that can control building access; prevent targeting occupants; integrates visual and audio notifications as well as enable efficient evacuation. The design approach covers the three main areas of building layout and circulation design which includes; means of ingress, circulation and means of regress (Koo et al., 2013).

"Risk is integral to everyday life. Consequently, everyone has their own, sometimes the anecdotal view of what risk is… of what risk management is and of their part in it" (CII Study Course 250:2001:1/2).

This preamble synthesis the omnibus nature of risk and inevitability of risk management in all spheres of life. Risk management aims at eliminating and control the adverse effects of risks on assets, lives and social responsibility of entities exposed to risks. It entails the achievement of both pre-loss and post-loss objectives. Pre loss objectives enable us to prepare for the potential loss (ahead of time) in a more economical way, reduce anxiety and meeting any legal obligation. Post lose objective involve survival responsibilities (Okonkwo, 2019). One way of managing risk is by transfer. Insurance is a risk transfer mechanism and its scope

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covers risk exposed to estates especially in emergency situations. Interestingly insurance has developed highly sophisticated techniques for relieving the burden of most of the risk associated with modern life and economic activities. Insurance softens the impact of the economic consequences of random harmful events by pooling risk and averaging the cost of compensating losses (Irukwu, 1991).

The insurance industry that has the mandate of protecting the patrimony of the insurable assets of persons has an obvious role to play in managing the emergency risks associated with real estates in Nigeria. How has the industry mitigated emergency risks in real estate management in Nigeria?

2.0 CONCEPTUAL REVIEWS

2.1 What is real estate?

Real estate is property made up of land and the buildings on it, as well as the natural resources of the land including uncultivated flora and fauna, farmed crops and livestock, water, and any additional mineral deposits (Investopedia, 2019). The four categories of Real Estate are Residential, Commercial, Industrial and Land. Residential real estate includes undeveloped land, houses, condominiums, and townhouses. The structures may be single-family or multi-family dwellings and may be owner-occupied or rental properties. Commercial real estate includes non-residential structures such as office buildings, warehouses, and retail buildings. These buildings may be free-standing or in shopping malls. Industrial real estate includes factories, business parks, mines, and farms. These properties are usually larger in size and locations may include access to transportation hubs such as rail lines and harbours. Land includes vacant land, working farms, and ranches. The subcategories within vacant land include undeveloped, early development or reuse, subdivision and site assembly. In Nigeria, main issues affecting real estate industry include Land Registration Bureaucratic Process; High Costs of Property Development; Collapsing Buildings; Bribery and Corruption; Taxation; Devaluation of the Naira; Limited Source of Funding; Lack of Competent Builders/Contractors; Omo-Onile syndrome (indigenes demanding levy for the foundation of a building, fencing of land, erection of gate, lintel stage, roofing stage, plastering stage, they levy the builders and artisans, levies are also charged for every building material transported to the site) and Liquidity (Emiedafe, 2015).
2.2 What is emergency and emergency management?

An emergency is an actual threat to life and safety. Business Dictionary defined an emergency as sudden, unexpected, or impending situation that may cause injury, loss of life, damage to the property, and /or interference with the normal activities of a person or firm and which, therefore, requires immediate attention and remedial action. The Urban School of emergency management explained emergency as an unplanned event that can cause deaths or significant injuries to the public; or that can disrupt operations, cause physical or environmental damage, or threaten the financial standing of businesses and institutions. Hornby (2015) described emergency as sudden serious and dangerous event or situation which need immediate action to deal with it. Events that are emergency include earthquakes, terrorism, floods, landslide, erosions, building collapse, fire disasters, road accidents, civil disturbances, insurgencies, explosions, an outbreak of diseases, and loss of key suppliers.

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Emergencies can be classified into two: non-disaster emergencies, and Disaster emergencies. non-disaster emergencies are those that the local emergency services are not part of the affected population or group, and can function normally to management the emergencies. Disaster emergencies are those emergencies in which the local emergency services are themselves victims and cannot function effectively.

Emergencies are related to risks and hazards. Hazards are any potential threat to life and safety; conditions that increase the frequency of the unwanted events and/or the severity of the loss. For our purpose, regarding emergencies, four classes of hazard are obvious: natural hazards, technological hazards, biological hazards, and societal hazards. Risk can be described as the consequences of exposure to a hazard; the chance of loss.

Wiening (2002) described the risk as any threat to an opportunity of enjoying or benefiting from an adventure. Thus anything that can constrain or encumber an occupant from enjoying an estate is a risk. It follows that an emergency risk of an estate can best be described as a crisis situation that can affect either an estate, occupants or both.

Emergencies are also related to crises. Crises are traditionally perceived as exceptional situations (Roux-Dufort, 2007). The crisis situation is a threatening phenomenon, surprising because it is unplanned. The crisis is a situation which creates an abrupt change on one or more variable(s) or key(s) of the system. It is a triggering event, which is so significant that it changes the existing structure, routine operations or survival of the organization. It is a high threat, short decision time and an element of surprise and urgency.

BISYS Educational Services (2011) defines a crisis as an inherently abnormal, unstable and complex situation that represents a threat to the strategic objectives, reputation or existence of an organization. Crises are not synonymous with incidents. There is a crisis when a system is confronted with an event, generally unexpected, of which the consequences develops in time with a dynamic which can be very fast, producing significant risks which exceed the pre-existing resources in terms of procedures of actions and actors.

Emergency management refers to designs and actions aimed at controlling the adverse consequences of emergency events on human life, society, assets and environments. The four phases of emergency management according to the Federal Emergency Management Agency (FEMA) include Mitigation (preventing future emergencies or minimizing their effects); Preparedness (preparing to handle an emergency); Response (responding safely to an emergency); and Recovery (recovering from an emergency; aimed at assisting the victims to normal living).

2.3 Major elements of a building and emergency risk of an estate

The major elements of buildings as contained in the National Bureau of Standard of US Department of Commerce are:

i. The foundation which supports and provide stability.
ii. The structure which supports all the imposed loads and transmit them to the foundation

iii. The exterior walls which may or may not be part of the primary structure.
iv. The interior partition which also may not be part of the primary structure.
v. The environmental control system including the heating, ventilation, air conditioning, lighting and acoustical system.
vi. The vertical transportation system including elevators, escalators and stairways.
vii. Communication which may include such subsystem as intercommunication, public address and close circuit television.

These design aspects need to be investigated and considered carefully with appropriate design information and guidelines to improve safety in the risk-prone environment. Considering and identifying hazard resistance methods for various natural and human-induced events should be an integral part of the design projects (Akadiri, Chinyio, & Olomolaiye, 2012).

Inadequate built environment design and crowd management can lead to loss of life and injury in public spaces (Langston, Masling & Asmar, 2006). However, it is not possible to define the boundaries in building design because it depends on the context and the purpose of the design (Hale, Kirwan & Kjellén, 2007). Human behaviour during building evacuation such as congestions, herding, panic, ignorance of guidance or variations in route and exit preferences based on the level of familiarity with the building challenges to design a fix guidance system for safe building design and they are effective issues to improve safety in buildings (Chu & Ye, 2012).

Some factor that causes loss to an estate may include fire, windstorm or tempest, Hail, Aircraft, Riot and civil commotion, explosion, vandalism, smoke, sprinkler leakage, sinkhole collapse and mine substance, volcanic action, breakage of glass, falling object, water leak or overflow, collapse, crime-theft, burglary or robbery, earth movement, flood, catastrophic perils such as war, maintenance perils such as wear and tear, marring and scratching, rust, gradual seepage of water, damage by insects, birds, rodents or other animals.

Similarly, the types of emergency risks that affect an estate may be classified as a natural disaster; technological crises; confrontation; malevolence; organizational misdeeds; workplace violence; rumours; and terrorist attacks/man-made disasters.

3.0 Insurance industry and emergency risk in the real estate industry

Insurance industry performs a risk management function in an economy. It does this by providing a scientific risk transfer mechanism for the insuring public. The regulators of the industry primes in the interest of the insuring public. This explained among others the provisions for insurance of building under construction and public buildings. In fact, the Insurance Act 2003 enacted for insurance of public buildings in section 64(1). The Act enacts that: "No person shall cause to be constructed any building of more than two floors without insuring with a registered insurer his liability in respect of construction risks caused by his negligence or the negligence of his servants, agents or consultants which may result in bodily injury or loss of life to or damage to property of any workman on the site or of any member of the Public". The insurance is against the hazards of collapse, fire, earthquake, storm and flood. Section 65(2) defines "Public building", to includes a tenement house, hostel, a building occupied by a tenant, lodger or licensee and any building to which members of the

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public have ingress and aggress for the purpose of obtaining educational or medical service, or for the purpose of recreation or transaction of business.

The insurance industry also promotes public attention to emergency risk management. The Insurance Act 2003, section 65(4) directs that 0.25 per cent of the net premium received by every direct insurer on policies issued under 65(1) shall be paid quarterly by every insurer into a Fire Services Maintenance Fund which shall be established, administered and disbursed by the Commission for the purpose of providing grant or equipment to institutions engaged in firefighting services.

Insurance services are inevitable to human habitation. Estates, building or properties which are exposed to risks including emergency risks need insurance protection. Most often the risk of the building are fortuitous and occur as an emergency. Insurance is a risk transfer mechanism cannot undermine the risk management processes in its operation. For any risk to be accepted for the insurance cover it will most often conform to some standard criteria. Such criteria will be a marriage between risk management processes and the recommended standard within an acceptable boundary prescribe by insurance. Thus insurance must set an acceptable standard in its practice in order to effectively manage risk. Insurance tends to manage risk from three broad perspectives namely: pre-loss function, underwriting functions and post-loss services.

3.1 Pre-loss Function:

Risk management function is very broad. According to Weining (2003), risk management function can be discharged in both large and small organizations. The small organizations in this context include individuals and families. Thus risk management function in real estate can cover both large estates or smaller family abode provided they are willing to conform to features of standard risk. In larger organization that has an insurance department, specific risk functions are performed by that unit. The scope of their function can be categorized into:

i. Risk management policies/process
ii. Risk management manuals, and
iii. Risk management information system

An insurer registered to accept property businesses like every other authorized insurers has laydown risk management policies, at least posed to implement the provisions of the Insurance Act 2003. The insurer is expected to act as risk adviser to the insured, and assist him in developing a risk management manual which assists in the proper management of the emergency risk exposed to the estate. One such area of inclusion is on crowd management during emergencies.

In crowded public spaces, people are highly affected by one another's behaviour. Moreover, the behaviour of people during emergencies differ from that under normal conditions because new and unique situations arise in case of an emergency where previous actions and interactions will no longer work with other people and the physical environment (Kuligowski, 2013; Provitolo, Dubos-Paillard, & Muller, 2011). Crowd management, as a systematic approach to control the behaviour of large groups of people for safety and

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security, helps in the planning, organization, guidance and evaluation activities considering crowd dynamics.

3.2 Underwriting Function:

Underwriting which is the process of assessing a risk proposal for insurance cover is an important function of the insurer. The building estate risks especially as it concerns emergency risks, the underwriting functions are in two stages: designing relevant fire policy and selecting relevant clauses. In designing the terms and conditions of insurance relevant to an estate, it is the responsibility of the insured to specify the peril(s) to be covered under an insurance policy. Nevertheless, the underwriter packaged the relevant policy under which the perils are covered. It is obvious that different brand names are used to package the Estate Insurance cover. Such name may include Fire policy, Home Owner Policy, and House Holder policy. Some underwriters choose a multiline policy or package policies.

BISYS Educational Services (2009) states that an estate, building or property can choose any of the three forms of policies: Basic form; Broad form; and Special form. The perils covered under each of the forms are shown in table 1, and Table 2 shows the classifications of the perils in Nigeria.

Another very important act in the underwriting function is selecting relevant insurance clause for the policy. The insurance policy serves as an agreement between both parties (the insured and the insurer). The clauses serve as the applicable conditions for the policies. Akintayo (2004) observed that a standard/special perils policy is exposed to about forty-two (42) clauses. It is the duty of the underwriter to identify the relevant clauses that will reveal the purpose and intent of the policy and input the same to the policy.

The insurer knowing the ominous task following the crystallization of the insured peril(s) proposes for consequential loss policy to the insureds more importantly if the estate is a public building. The consequential loss policy may serve as a rider to the fire policy and elevate the burden of loss associated with the occurrence. The consequential loss policy does among other things the under listed five things.

i. It makes good the net profit which would have been earned but for the damage caused by the fire/ special peril.
ii. It pays such fixed charges as interest, rents, and rates which are payable even though the business has been interrupted.
iii. It bears any reasonable expenses which will hasten the resumption of normal business and minimize loss of net profit.
iv. It pays the wages of some key staff.
v. It pays the fees of the auditor employed to prepare any claim under the policy.

Table 1: Table showing the perils under each form of Basic Policy

PERIL	CLASSIFICATION		
	Basic	Broad	Special

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Fire	√	√	
Lighting	√	√	
Explosion	√	√	
Windstorm or hail	√	√	
Smoke	√	√	
Aircraft or vehicle	√	√	
Riot or civil commotion	√	√	
Vandalism	√	√	
Sprinkler	√	√	
Leakage	√	√	
Sinkhole collapse	√	√	
Volcanic action	√	√	
Falling object		√	
Weight of snow		√	
Ice sheet		√	
Water damage		√	
Additional coverage		√	
Property in transit (cover extension)		√	
Water, liquids		√	√
Powder, molten material		√	√
Collapse		√	√
Glass-coverage extension		√	√

Source: BISYS Educational Service Material 2009

Table 2: Risk covered under standard policy & special perils

PERIL	**CLASSIFICATION**	
	Standard Policy	Special Peril
Fire	√	√
Lighting	√	√
Explosion	√	√
Storm		
Flood		√
Bust pipes and overflowing of water		√
Water		√
Impact by vehicles		√
Malicious damage		√
Earthquake damage		√
Aircraft damage		√
Bush fire		√
Explosion		√
Tornado and cyclone		√

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Riot and strike	√

Source: Akintayo (2009). Fundamentals of Insurance Claims. Lagos Nigeria: CSS Press Ltd.

3.3 Post Risk Function:

When the loss occurs, as they sometimes do, the insurer has prominent roles to perform. This awareness determines the scope of responsibilities which the insurer will prepare to accept. In preparation for the post-loss function, the insurer performs the claim handling function.

Claim settlement is the actual manifestation of the role of insurance to the emergency risk associated with building estate. Claim settlement is a very vital issue that may cause dispute between the insurers and their policyholders. To avoid dispute or dissatisfaction the insurer must structure its claims unit to be able to accommodate claims and make payment promptly. Of course, an important factor that distinguishes a good insurance company is its claim settlement services. The common claims procedure include:

i. The insurer should be notified by the insured of the loss situation.
ii. Particulars and proof of loss should be provided by the insured.
iii. The insurer should conduct a thorough investigation to affirm the loss situation and to its conformity with contract form.
iv. Most importantly payment of claims should be made without delay.

The insurance Act 2003 enacted on how the money insured on the burnt building should apply. The relevant provisions states:

Section 66.-(1) Where a house or other building insured against loss by fire is damaged or destroyed by fire and there is no reasonable ground to suspect that the owner, occupier or another person who insured the house or other building is guilty of fraud in respect of the insurance, or of willfully causing the fire, the insurer who is liable to make good the loss may, on the request of any person entitled or interested in the insured house or building cause the insurance money payable to be paid out and expended as set out in subsection (2) of this section.

(2) The insurance money payable under subsection (1) of this section shall be paid out and expended towards rebuilding, reinstating or repairing of the house or other building so burnt down, damaged or destroyed by fire, unless-

(a) the party or parties claiming such insurance money shall within 60 days after the claim is agreed, give security to the satisfaction of the insurer that the insurance money shall be paid out and expended as stated herein; or

(b) the insurance money is, at the time, settled and disposed of and among all the parties entitled as the insurer may determine with the approval of the Court on the application of the insurer or any of the interested parties.

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(3) Notwithstanding the provisions of subsection (1) of this section, the insurer shall have the right to elect whether to reinstate the house or building damaged or destroyed by fire or to pay the insured for the loss suffered but not exceeding the insured sum.

4.0 CONCLUSION AND RECOMMENDATIONS

Insurance role in the emergency risk of an estate encompasses pre-risk, underwriting and post risk functions. The Pre risk function of policy formulation, risk manual and risk management information system. Underwriting function includes recommending relevant policies and clauses. The post risk function entails prompt claim settlement to ensure rehabilitation of the estate occupants if insured events took place.

Generally, the risk management function in connection to the insurance industry encompasses incident reporting and claims management; renewals/data collection; premium allocation and calculation; asset management; policy management; contract vendor management; enterprise risk management; risk financing; and insurer rating.

This study hereby recommends that: insurers should introduce a clause call emergency exist clause in the fire insurance policies. This clause will among other things recommend that adequate emergency exit be put in place as prescribed by the estate/town planning authority. Where such compliance is made, a discount should be offered to such insured. Examples of exiting clauses that can be similar to the anticipated emergency clause include Fire bridge clause; Fire extinguishing appliance clause; and Municipal plans scrutiny clause.

This study recommends that a proper crowd management design should be added to public building designs and made a condition precedent and a prerequisite for risk acceptance.
Estate managers and architects should take the issue of the emergency situation more seriously and ensure that some other proactive measures like a sprinkler fire alarm, emergency exit among others are taken into consideration in building designs.

Given that the poorly coordinating stances of the estate industry in Nigeria promotes exorbitant rents inducing poor property development and high rate of building collapse, the Federal Government should make a white paper on a comprehensive blueprint on estate development addressing also housing deficits in Nigeria.

REFERENCES

Akadiri, P. O., Chinyio, E. A. & Olomolaiye, P. O. (2012). Design of a sustainable building: A conceptual framework for implementing sustainability in the building sector. *Buildings* 2, 126—152.

Akintayo, L. A. (2004). *Introduction to General Insurance Underwriting*. Lagos Nigeria: CSS Press Ltd.

Akintayo, L.A. (2009). *Fundamentals of Insurance Claims*. Lagos Nigeria: CSS press Ltd.

BISYS Educational Services (2009 Lecture Materials). Property and Casualty principles. BISYS Edu. Services Atlanta USA.

Volume: 03, Issue: 02 "March - April 2020"
ISSN 2582-0176

BISYS Educational Service (2009 Lecture Materials). Commercial Property Coverage BISYS Edu. Services Atlanta USA.

Business dictionary (nid). **http://www.businessdictionary.com/definition/emergency.html**

CII Nigeria (2001). *Risk Management (Study Course 250).* Lagos: Chartered Insurance Institute Publishing Division.

Chu, J., Yeh, C.Y. (2012). Emergency evacuation guidance design for complex building geometries. *Infrastructure System, 18*, 288—296.

Dimeji-Ajayi, D. (2018). Real Estate Market Report 2018. https://www.propertypro.ng/blog/realestate-market-report-2018/

EHA (nd). *Concepts in Emergency Management.* The basis of EHA Training Programmes in WPRO.

Emiedafe, W. (2015). Top 10 Issues Affecting Nigeria Real Estate Industry. *http://sapientvendors.com.ng/10-issues-affecting-nigeria-real-estate-industry/*

FEMA (nd). *https://training.fema.gov/emiweb/downloads/is10_unit3.doc*

Fiiwe, J. L. (2000). *Risk and Insurance for Beginners*. Bari: Trumpet Press & publishers.

Florida Department of Revenue (2002). *The Florida Appraisal Guidelines*

Hale, A., Kirwan, B. & Kjellén, U. (2007). Safe by design: Where are we now? *Saf. Sci. 45*, 305—327.

Hornby (2007). *Oxford Advanced English Dictionary*. London: Oxford Press.

Investopedia (nd). *https://www.investopedia.com/terms/r/realestate.asp*

Irukwu, J.O. (1991). Risk Management in Developing Countries. Lagos: Bima Publications Bima Africa Ltd.

Kecklund, L., Andrée, K., Bengtson, S., Willander, S. & Sire, E. (2012). How do people with disabilities consider fire safety and evacuation possibilities in historical buildings?—A Swedish case study. *Fire Technol. 48*, 27—41.

Koo, J., Kim, Y., Kim, B., & Christensen, K. (2013). A comparative study of evacuation strategies for people with disabilities in high-rise building evacuation. *Exp. Syst. Appi., 40*, 408-417.

Kuligowski, E. D. (2003). The Evaluation of a Performance-Based Design Process for a Hotel Building: The Comparison of Two Egress Models. *Master Thesis*, Department of Fire Protection Engineering, Faculty of the Graduate School of the University of Maryland, College Park, MD, USA, December 2003.

Volume: 03, Issue: 02 “March - April 2020”

ISSN 2582-0176

Kuligowski, E. (2013). Predicting human behavior during fires. *Fire Technol. 49*, 101—120.

Langston, P. A., Masling, R., & Asmar, B. N. (2006). Crowd dynamics discrete element multi-circle model. *Saf. Sci. 44*, 395—417.

Okonkwo, V. I. (2019). *Lecture Material on Advanced Risk Management*. Enugu: Department of Insurance and Risk Management; ESUT.

Provitolo, D., Dubos-Paillard, E. & Muller, J. P. (2011). Emergent Human Behaviour during a Disaster: Thematic Versus Complex Systems Approaches. *In Proceedings of EPNACS 2011 within ECCS'I I Emergent Properties in Natural and Artificial Complex Systems*, Vienna, Austria, 15 September 2011; pp. 47—57.

US. Department of Commerce (2005). Design and Construction of Building Exits, National Burean of Standard. USA

Wiening, E. A. (2003). *Foundations of Risk Management Insurance*. Pennsylvania USA: American Institute for Chartered Property Casualty Underwriting.

