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HARZARD AND THREAT ABATEMENT MEASURES PLANNING IN AHMADU BELLO STADIUM KADUNA

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Abstract

Global incidences of vulnerability of sport venues to hazards and threats is becoming worrisome and a source of concern to researchers and other stakeholder's. This study sought to plan abatement measure for Ahmadu Bello Stadium, Kaduna, Nigeria, by identifying the possible hazards and threats with a view to preventing it. The Method used for the study was explorative design of Literature and questionnaire survey. The review include; reported cases of stadium hazards, concept of hazard abatements and strategies for curbing stadium hazards. These information were used to develop a structural questionnaire. Subsequently employs disproportionately sampling technique to survey 200 respondents. The respondents comprises of: residents that are neighbouring the stadium, stadium officials and, stadium users. The survey attains 96% response rate. Additionally, the study develops a checklist to elicit information through personal observations. Data collated were analysed using excel to conduct descriptive statistics that includes frequencies and percentages. The result in accordance with the FIFA stadium safety and security regulation, revealed that Ahmadu Bello Stadium Kaduna, Nigeria, is susceptible to all kind of hazards and threat especially with the uncertainty of terrorist actions because of their fanaticism and willingness to die for their cause and fan behaviour. Therefore the study recommend safe growth audit strategy to decide in advance the way to deal with the situations, which may likely happen if not now certainly in near future.

KEYWORDS:
Hazard abatement, Measures of hazard abatement, planning for hazard

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Introduction

Actions to abate vulnerability of hazards and threats, form core and key outcome of a planning process (Godschalk & Berker, 1999). Hazard abatement and land-use planning share a future orientation both are concerned with anticipating tomorrow's needs, rather than responding to today's problems (Godschalk & Berker, 1999). Planning is nothing but thinking before the action takes place, which looks into the future and decide in advance the way to deal with the situations, before encountering it. It involves logical thinking and rational decision making process. Planning is a fundamental abatement function, which involves deciding beforehand, what is to be done, when is it to be done, how it is to be done and who is going to do it in an intellectual process by laying down objectives and develops various courses of action, which the goals can be achieved. Planning of Hazard abatement is an integrated process of "action comply with a cited standard or regulation to eliminate or reduce recognized threat(s) by organizing, coordinating and implementing measures that are necessary or expedient for prevention of danger or any form of threat through: capacity building; preparedness to deal with any disaster; prompt responses to disaster situation, evacuation; rescue and relief; rehabilitation and reconstruction occupational safety and health administration OSHA (United States Department of Labour, 1997), to effectuate change (Berke & Smith 2010), on clear and practicable coordinated goal to reduce impact of the hazard(s) (Kerke, Smith & Lyles, 2012).

Globally, sports arenas and events are susceptible to various threats and hazards of fans violence/stampedes, riots, hooliganism, incidences of fire, collapse of retrofit structures and terrorism activities (Fried, 2005; Lipton, 2005; Stacey, Lau & Walter, 2008). Keith (2018) reported that in Lima, Peru, 318 people were killed, 500 injured in a riots at National Stadium after Olympic qualifying match on the 24th of May, 1964. Similarly, in 1971 (Jan 2nd) in Glasgow, Scotland, 66 people were killed and 140 were injured when barriers in Ibrox Stadium collapse and fans were crushed. On the 13th of January, in Orkney, South Africa, 40 people were killed and 50 injured in triggered violence and stampede in a sporting arena. In Monrovia, Liberia, on the 23rd of April, at least 3 people were reported dead and others injured as thousands of fans forced their way into an overcrowded stadium. One person was killed and 40 injured on the 9th of September, 2018, in Antananarivo stadium Madagascar after a group of spectators became trapped between a closed entrance gate and an incoming crowd. On the 15th of March, 2014 in Abuja, Nigeria, 7 people were killed and dozens injured after thousands of panicked job-seekers were stampeded at the national stadium. In considering such catastrophic

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incidences, it is very necessary to be constantly reminded that Ahmadu Bello Stadium Kaduna sporting arena is susceptible to such vulnerable hazards. Should such hazard occur, casualties will definitely be high (Stacey, Marciani & Cooper, 2008), that is why United Nations Disaster Relief Coordination (UNDRC, 1990) placed more emphasis on planning for the abatement measure of disaster rather than apportioning relief when the deed has been done. It is on this backdrop that this study sought planning for abatement measure in Ahmadu Bello Stadium Kaduna, Nigeria with a view to enlighten the highly populated urban football fans the dangers of hazards if it occurs

Literature Review

Concept of Hazard Abatement

Hazard abatement is any action taken before, during, or after a disaster to permanently eliminate or reduce the long-term risk to human life and property from man-made and natural hazards (Berke & Smith 2010). The intent of abatement measures is not to reduce only, but to ensure that lives and properties are not lost. Abatement of hazards related to unsafe conditions in connection with playground is a logical progression of inspection program (Anonymous, n. d). The intent of the inspection program is to identify safety in order to effect the necessary abatement measures. Irrespective of whatever hazard(s) identified, the basic guidelines by which abatement should take place include the following: Levels of risk to the public; degree of severity of the most likely accidental injuries; potential for liability; and requirements related to abatement (repair, refurbishment or replacement). Taylor (1990) reported that safety and crowd control are inter-dependent. This is on the background that, if crowd gets out of control safety is in jeopardy. Measures to control the crowd, must always have an impact on safety. Wider and deeper inquiry shows that overcrowding is only a feature amongst a number of causing danger or hazards in stadia. Old grounds, poor facilities, hooliganism, terrorism, excessive drinking and poor leadership among others are nonetheless also threats. Stadium hazards will continue to cause serious injuries and fatalities that is why Federation Internationale Football Association (FIFA) finds it unacceptable. As such, stadium safety and security is based on balance between design and management (FIFA, 2012). This is to abate the risks to which spectators, VIPs/VVIPs, players and/or officials or any other person may be exposed to, space to facilitate car parking, external and internal circulation and sufficient exits and entrances to the spectator areas. Location of stadium grounds in central city or town sites precludes this provision of space which implies the adoption of a gradual but progressive policy of disposing of grounds in densely developed areas and replacing the facility on the urban periphery as an abatement strategy in providing opportunity for safety and comfort.

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Strategies in Curbing Stadium Hazard

Stadium is crucial to be safe and secured environment

With appropriate access control measures through the use of accreditation. This is to ensure that restricted areas are kept secure and that only persons with valid permits will be allowed access. Similarly, a wall or fence to enclose the outer perimeter of the stadium to be at least 2.5 metres in height and shall not be easy to scale, penetrate, pull down or remove. Its purpose shall be to deter and delay any unauthorised intruder(s). Perimeter fences shall be protected by CCTV or security posts or a combination of the two. Access gates must be able to be opened or closed quickly without causing any danger or hazard. Turnstiles and checkpoint facilities may be incorporated within the inner perimeter. Emergency gates must be able to be opened quickly and easily towards the field of play. The emergency exit gates shall have one door and be at least two metres wide (FIFA, 2012)

Keeping Stadia Arena out of Crowded Areas

Purpose is to influence the *location* of such areas associated to hazard away from known hazard areas and toward safe growth locations. Through zoning and subdivisions regulations that can direct such development away from hazard areas through designation of location specific allowable land uses and standards for public safety (Godschalk and Berke, 1999).

Stadium Safe Growth Audit

This *is* a method used to analyse the impacts of the full slate of current policies, ordinances, and plans on stadium safety from hazard risks due to growth. The Audit gives the community a comprehensive but concise evaluation of the positive and negative effects of its existing growth guidance framework on future hazard vulnerability. It informs citizens and decision-makers about important safety issues and highlights needed changes in policy and planning instruments (Godschalk & Berke, 1999).

Retrofit Buildings Structure of the Stadium and Facilities at Risk

Needs to be redeveloped and protected against hazard risks. This is in form of older structure of the stadium built prior to building codes that contain higher safety standards, as in the case of communities within the area of stadium. For them to accommodate higher densities and intensities of future development, their existing structures and facilities should be strengthened or elevated (Godschalk and Berke, 1999).

Develop Knowledgeable Community Leaders and Networks

Safe growth needs the knowledge and actions of all community stakeholders, including non-governmental institutions and social networks around stadium

arena. Governments alone cannot ensure safe growth. Thus a Safe Growth Audit needs to look at how community stakeholder share hazards knowledge about hazards and make decisions relative to growth. The goal is to ensure strong community networks and community leaders prepared to make safe decisions concerning growth both before and after disasters ((Godschalk & Berke 1999).

2.2.6 Monitor and Update Safe Growth Programs and Plans

Safe growth needs up-to-date programs and plans. Hazard and vulnerability estimates change as new information becomes available from up-dated analyses and as the result of disaster learning. Growth conditions also change, as new development trends emerge and new projections are made. Safe Growth Audits should be revised on a regular basis to ensure their continued validity (Godschalk and Berke, 1999)

Zoning Ordinances to Reflect New Building Code and Shoreline Protection Rules

This is one of the planner's most effective tools for limiting damage from hazards. This restrict development in hazardous areas to land uses that will not suffer extensive disaster losses and encourage growth in safe locations. This is achieved by specifying the location, type, amount, density, and characteristics of development permitted in mapped zoning districts. Where and how these development characteristics are applied affects both the physical and the social vulnerability of the jurisdiction. Incorporate hazard area classifications into standard zoning classification (Godschalk and Berke, 1999).

2.2.8 Protective Security Measures

This include resources and procedures designed to protect a facility against threats and to mitigate the consequences of an attack (Stacey, Marciani & Cooper, 2008). Protective measures are designed to promote strategy to effectively prevent, prepare, respond, and recover from terrorist attacks (National Strategy for Homeland Security, 2002). Security policies and procedures need to be reviewed and have requested help regarding access to timely security information, assistance in conducting vulnerability assessments, and the provision of training for emergency response planning (Baker et. al, 2007; Phillips, 2006). Develop community warning systems. Strengthen the role of the Local Emergency Planning Committee in the land development process. Integrate hazard mitigation into the capital improvement planning process so that public infrastructure does not lead to development in hazard areas. Integrate hazard mitigation into the community's planning enabling legislation.

Stadium Hazards

Federal Bureau of Intelligence (FBI) issued an alert in July, 2002 warning that football stadiums are possible terrorist attack site based on their motto of mass casualties and mass exposure of humiliation identified on five categories of threat motivations: political, religious, racial, environmental, and special interest. Their

various types of threats and hazards occurs in a stadium as: medical emergencies, fire outbreak, bomb threat/explosion, mechanical/structural failure, civil disturbance/ fans violence, hazardous materials release, terrorism, building evacuation, natural disasters/severe weather and others such as political tensions of team supporter level, racist or aggressive language banners or behaviour and pitch invasion. Others include, specific terrorist threats (Stacey, Marciani & Cooper, 2008), such as explosives, suicide bombers, arson, hostage taking, and active shooters, are major concern to sport stadiums and arenas (Estell, 2002; Kennedy, 2006; Lipton, 2005; National Strategy for Combating Terrorism, 2003; National Planning Scenarios, 2005; Philpot, 2007a).

Stampede according to Keith, (2018), this usually occur when stadium is filled to capacity with spectators throwing cans and plastic bottles onto the pitch. In calming the situation police will respond by firing into the crowded tear gas canisters. Creating panic and in trying to escape or run towards exits to get away from the noxious fumes from the stadium. People will be trampled and get injuries or even dies.

Noise from a stadium can be a major concern for local residents. Solutions for reducing the noise pollution of surrounding areas, particularly for venues located in the city centre or in residential areas, need to be identified at an early stage. Close liaison on noise control with the local authorities and the wider community is advisable, and the stadium design should aim to mitigate as far as possible the acoustic impact on the surrounding area.

Major lessons have been learned from the fire-related stadium disasters of the past. To avoid future tragedies, extensive active measures (e.g. extinguishers and sprinkler systems) and passive measures (e.g. fire vectorisation and fire doors) need to be correctly implemented, in close consultation with the local fire department.

Methodology

The research is delimited to Ahmadu Bello Stadium Kaduna and the neighbourhood 60-100km radius around the stadium. The stadium host local and international football matches and, other public and private gatherings. Kaduna is the State capital of Kaduna States and is located in the north central part of Nigeria. The stadium is located in northern part of Kaduna town, along constitution road. It covers an area 38,340 hectares and is surrounded by the following neighbourhood: Sardauna Crescent, Aro Chukwu, Abubakar Kigo, Old & New extension, Cameroun road, and Kabala Doki. The study reviewed literature to capture information on the concept of hazard abatement; cases of hazards, and strategies of curbing stadium hazards. These information were used to develop a structural questionnaire. Subsequently employs disproportionately sampling technique to survey 200 respondents. The respondents comprises of: residents that are neighbouring the stadium, stadium officials and, stadium users. The

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survey attains 96% response rate. Additionally, the study develops a checklist to elicit information through personal observations. Data collated were analysed using Excel to conduct descriptive statistics that includes frequencies and percentages.

Result and Discussion

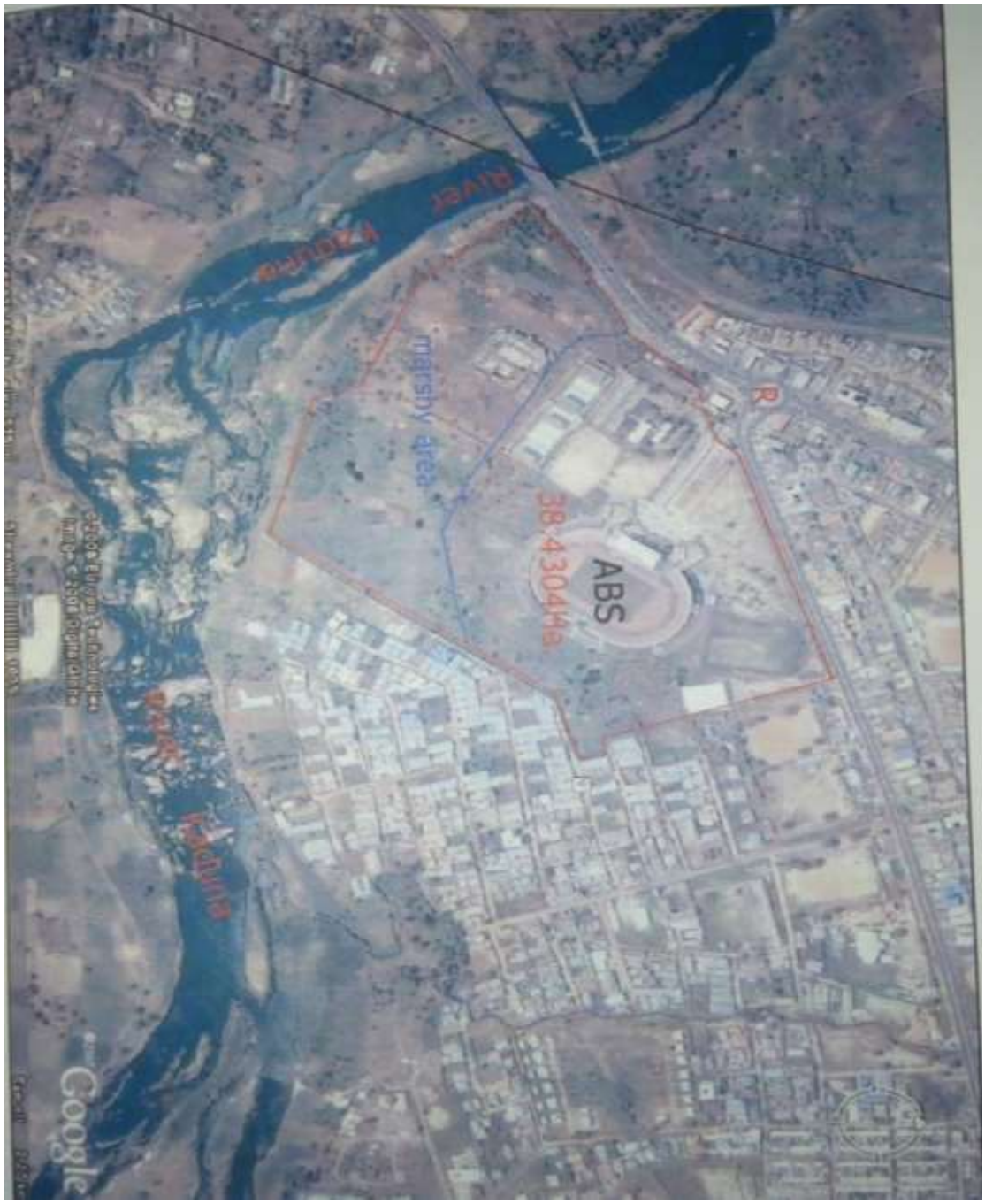


Figure 1: Google Earth Map of Ahmadu Bello Stadium Kaduna, Nigeria.

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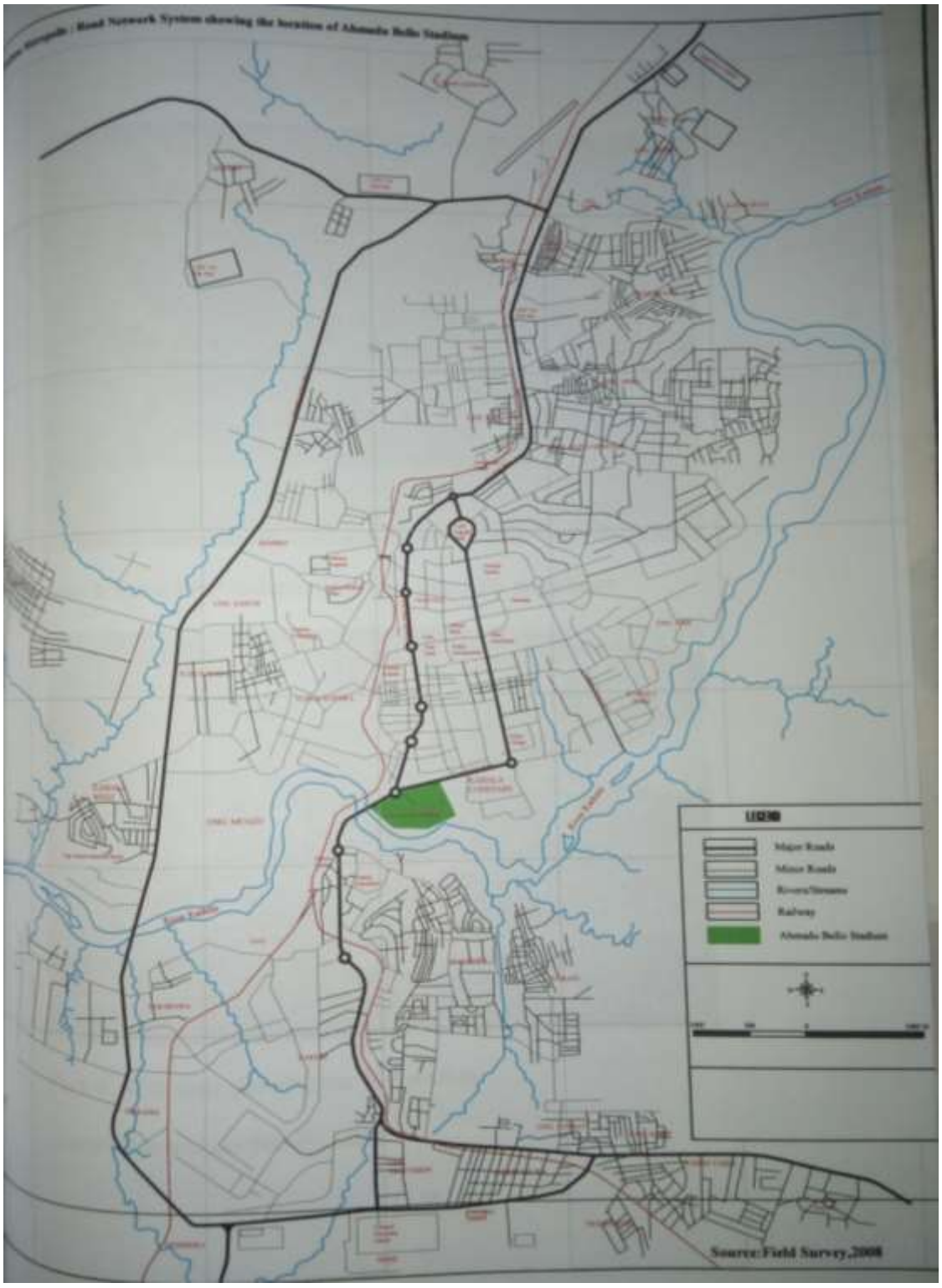


Figure 1 Land Use Map of the Study Area
Sources: KASUPDA

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Table 1: Characteristics of Respondents

Variables	Respondents	Valid Responses		Percentage
Residents within 60-100 meters		50	47	94%
Stadium officials		50	48	96%
Stadium users	Basketballers		7	7.3 %
	Athletes		21	21.9 %
	Spectators		31	32.3 %
	Footballers		37	38.5 %
Total		**100**	**96**	**100 %**
Gender	Male		134	70.2 %
	Female		57	29.8 %
Total		**200**	**191**	**100 %**
Respondents qualifications	Degree		30	15.7 %
	HND		18	9.4 %
	NCE/ND		35	18.3%
	SSCE		27	14.1 %
	Primary cert.		42	22.1 %
	None literate		39	20.4 %
Total		**200**	**191**	**100 %**
Age	18 – 28yrs		51	26.7%
	29 – 38yrs		37	19.4 %
	39 – 48yrs		43	22.5 %
	49 – 58yrs		27	14.1 %
	59yrs & above		33	17.3 %
Total			**191**	**100**

Source: Authors, 2019

Table 1 characteristics of the respondents. The result revealed that 94% respondents are residents neighboring Ahmadu Bello Stadium Kaduna. Ninety six percent (96%) are stadium officials and the stadium users, 38.5% are footballers, 32.3% spectators, 21.9% athletes and 7.3% basketballers. On gender, 70.2%

respondents are male and 29.8% female, this is an indication that sports activities are mostly male dominated activities. The respondents' educational qualifications vary as follow; primary school certificate holders are 22.1%, degree holders 15.7%, HND holders 9.4%, NCE/ND holders 18.3%, Senior Secondary Certificate Education holders 14.1% and none literate 20.4%. By implication it is an indication that 79.6% majoring of the respondents are literate to have understood the content of the study and responded appropriately. Similarly, Age of the respondents vary but all respondent are not less than 18yrs by implication there are all adults categorized as follows 18-28yrs 26.7% , 29-38yrs 19.4%, range between 39-48yrs 22.5%, range between 49-58yrs 14.1% and are 59yrs and above 17.3% .

Table 2: Perceptions of Possible Hazard in Ahmadu Bello Stadium Kaduna, Nigeria

Hazards	**Respondents and Percentage Response**					
	Resident's	**%**	**Officials**	**%**	**Users**	**%**
Riots	7	14.9	5	10.4	18	18.8
Fighting	8	17.0	12	25.0	26	27.1
Stampedes	7	14.8	11	22.8	19	19.8
Hooliganism	6	12.8	8	16.7	15	15.6
Vehicular accidents	6	12.8	4	8.3	9	9.4
Fire- outbreak	5	10.6	1	2.1	2	2.1
Bomb explosion	2	4.3	2	4.2	3	3.1
Kidnapping	1	2.1	3	6.3	1	1.0
Thunderstorm	3	6.4	2	4.2	2	2.1
Flooding	2	4.3	0	0	1	1.0
Total	**47**	**100**	**48**	**100**	**96**	**100**

Source: Author, 2019

Table 2 the perception of possible hazard in Ahmadu Bello Stadium Kaduna, Nigeria, the result revealed that residents' perception on rioting is 14.9%, officials 10.4% and users 18.8%. Similarly on the possibility of fighting residents' perception is 17.0%, officials 25.0% and users 27.1%. On the possibility of stampedes residents responded 14.8%, officials 22.8% and 19.8%. Hooliganism resident responded 12.8%, officials 16.7% and users 15.6%. On vehicular accidents residents 12.8%, officials 8.3% and users 9.4%. Possibility of fire outbreak residents 10.6%, officials 4.2% and users 3.1%. Possibility of terrorism threat of bomb explosion, residents' response 4.3%, officials 4.2% and users 3.1%. Kidnapping resident response 2.1%, officials 6.3% and

users 1.0%. Thunderstorm residents the possibility is 6.4%, officials 4.2% and users 2.1%. Threat of flooding the residents 4.2%.

Table 3 Emergency Hazard Abatement Measures & Devices in Ahmadu Bello Stadium Kaduna Nigeria

EHAD	Location in the Stadium	QTY
Police post	Popular site South outside the stadium	1
Clinic	Inside the administrative building	1
Weather forecast board	In front of the ABS main entrance	1
Wind Vane	Inside the ABS	1
Fire Extinguishers	Media centre, communications unit, clinic, press gallery & gym	12
Emergency Exits	Distributed within the main bowl	6
Fire Alarm	None functioning	0
Private Security Outfit	At the entrance of the stadium	1
Closed Circuit Cameras	None functioning	0
Control Fencing Equipment	Functioning	
Metal Detectors	Available and functioning	12
First Aid Stations	None functioning	0
Smoke Detector	All over the stadium	15
Anti-bomb squad unit	None existing	0

Source: Authors, 2019

Table 3 identified emergency hazard abatement measures and devices in Ahmadu Bello Stadium Kaduna Nigeria. The finding revealed that there is a police post plate 1 located at the popular entrance gate outside the stadium, however, the study found out that the out post is in short of personals and professional police officers to be able to man the stadium in the case of hazard and threats. Similarly the stadium have clinic inside the administrative building but unfortunately it lacks well-functioning good infrastructure and equipment to cater for many persons in case hazard occurs. Generally Ahmadu bello stadium kaduna Nigeria apart from it centrality and strategic location in hosting different events that always accommodate heavy crowd it lack functioning equipment as stipulated by FIFA, (2012) stadium safety and security regulation and as such the stadium by implication is susceptible to all kind of hazards and threat especially with the uncertainty of terrorist actions and fan behaviour, it is possible to say that ahmadu

bello stadium kaduna Nigeria is not a risk-free environment as a sports venues. It is therefore a matter of how one prepares, responds, and recovers to mitigate the consequences of emergencies as stated by (Schwab, Eschelbach, & Brower, 2007).



Plate 1 Police out Post Ahmadu Bello Stadium Kaduna, Nigeria



Plate 2 Sports Weather Display Board



Plate 3 Entrance of Ahmadu Bello Stadium Kaduna Nigeria



Plate 4: VIP Section of Ahmadu Bello Stadium Kaduna,Nigeria



P**late 5: Ahmadu Bello Stadium Kaduna Nigeria Spectator's Popular Site**

Conclusion and Recommendation

In accordance with the FIFA (2012) standard of stadium safety and security regulation, Ahmadu Bello Stadium Kaduna, Nigeria, by implication is susceptible to all kind of hazards and threat especially with the uncertainty of terrorist actions because of their fanaticism and willingness to die for their cause (Kennedy, 2006), and fan behaviour. Hurst, Zoubek, and Pratsinakis (n.d.) in (Stacey, Marciani & Cooper, 2008), reported that regardless of the analysis that will be conducted after an incident, "the fundamental question will always be whether or not reasonable steps were taken to protect against an incident in light of the availability of FIFA, (2012) stadium safety and security regulation for hazards and threats. As such cases of sport arenas vulnerability to hazards and threats that always resulting to significant damages to property and loss of lives should constantly be remained off to plan and prepare for it to safe the surrounding communities, spectators, officials, and players. Therefore the study recommended the Stadium Safe Growth Audit strategy.

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