

# INTRODUCTION

According to Schmerts (1972), tertiary institutions should be designed to accommodate students in hostels within the school environment for effective and optimal of academic activities. These hostels should be comfortable and could be in the form of rooms, halls or apartments. Facilities like toilets, laundry, lounge, etc., are also provided for the convenience of students. The provision of these facilities is usually guided by set standards as well as the number of students expected to reside in the hostels (Ernst and Neufert, 1993).

The little attention paid by Nigerian government and authorities of institutions to housing has led to gross inadequacy in hostel facilities, resulting to overcrowding, over-utilization, deterioration of facilities and higher fire risks. It has increased the number of off-campus students who cannot find spaces in the available hostels. The effect of this situation on academic performance, health and social behaviour of students is negative and cannot be over emphasized (Onwuka, 1990).

## Fire Hazards Occurrence In Hostel Buildings

The current trend of frequent fire outbreak in hostels has become a major concern for all. There have been a lot of incidences of fire in hostels, where students lost their lives and properties. According to daily champion newspaper (2011), a fire incident occurrence destroyed one of the students' hostels in government girls' secondary school, rogogo, katsina state. The inferno was caused as a result of electrical fault. Another incident occurred in a hostel at Jos; Plateau State, Nigeria, and killed twenty three students as a result of obstruction from escape by burglary proofs. (Olaitan and Dairo, 2009). Fire in buildings poses serious challenges to fire fighters. The potential combinations of a large number of occupants, numerous ignition sources, high fuel loads and sleeping occupants create several issues that can be difficult to resolve. These issues need to be reconciled with the building codes, fire safety design and cost constraints of the project (Shao-Hoong, 2001).

Fire safety practices have suffered serious neglect among designers and users of buildings. This may be due to indifference and ignorance on the part of the building owner, the designer and/or the users. Flexibility of design of buildings provides greater opportunity to realize efficiencies and effectiveness in fire safety. It is necessary to think of how to avoid the problem than coping with it. This paper intends to identify the problems and attitudes associated with fires in buildings with the view to proffering solution.

## CAUSES OF FIRE

Fire occurrence in hostel buildings can be attributed to several factors. According to Hassan (1999) the factors are thus grouped under the following;

- **Accident**



Accident is said to result from an unplanned event which could lead to shock, injury, damage to life and property (Hassan, 1999). Fires which result from accidents are emergency or limitless cause of combustion; fire from this source could be due to faulty electrical equipment and wiring system, and fire spread from neighbouring properties.

- **Faulty Electrical Equipment and Wiring System**

Fault resulting from electrical equipment such as fan, air-conditioning system, lighting fixtures and power fixtures usually cause fire in hostel buildings if the occupants do not ensure all essential safety precaution in management of electrical equipment. At any event of faulty in wiring system, fire outbreaks become imminent.

- **Fire Spread**

Fire spreads from neighbouring buildings can affect another and result to outbreak in the building if not appropriately checked. Uncontrolled and careless burning of bushes or rubbish could cause fire outbreak when it is done indiscriminately.

- **Carelessness**

Recklessness, on the part of an occupant in a hostel building, not following the necessary safety precautions during the use of fire ignitable item may result to an outbreak. Fire from this source usually initiate at a point and spread around the building if not hastily controlled.

Fire from this source may arise through the following means:

- i. **Careless handling of combustible materials**

Careless usage of matches and lighters by students; they may drop it without making sure the light is no properly off could come in contact with fire combustible material especially during the dry season, this thus result to fire outbreak.

- ii. **Candle sticks**

Many students in hostel accommodation use candles as a replacement for electric lights in situation of power outage, mishandling of candle light, placing it on an rickety base, allowing the candles unquenched on its own or allowing candle to drop off at approximate combustible agent will cause fire outbreak.

- iii. **Careless Handling of Inflammable Liquid**

This is one of the most common causes of fire in hostel building, mishandling of kerosene, fuel; when this liquid come in contact with heat and ample oxygen will result fire in hostel building.

**Religious and Ethnic Crisis:** In recent times, Nigeria experienced series of religious and ethnic crisis like the Tiv – Jukun crisis (2002), religious crises in the north (2001, 2006), the Boko haram bombings in the north (2011). Many of these crisis often result in fire attacks on their opponent, thereby causing fire outbreak in buildings.



# IMPACT OF FIRE TO HEALTH AND SAFETY OF STUDENT IN THE HOSTEL BUILDING

## Pollution

The environmental impact of fires is well established, although it is not clear whether any detailed (quantified) studies have been carried out. Fires produce carbon dioxide (CO<sub>2</sub>) and other pollutants (H<sub>2</sub>S, NO<sub>x</sub>, SO<sub>2</sub>, etc). Fires hazards, for example in building, are a major source of CO<sub>2</sub> and other pollutants, and it is estimated that the smoke produced from burning PVC can be highly toxic and the presence of dioxins in fire residues has been long recognised. Some fire retardants (PCBs) have been identified as being significantly damaging to the environment. This risk needs to be assessed against the environmental damage from a fire. In addition, the damage caused to a building by a fire can result in the exposure or distribution of hazardous materials, notably asbestos or other toxic chemicals or agents.

## Quality of life

The need to protect against death or injury from fire might be expected to be as significant an issue – with regards to quality of life – as that of security. The physical and emotional injuries from fire may require long-term medical care, and can severely affect the victim's quality of life and that of their family. In addition to being traumatic, fire in a hostel building can destroy irreplaceable possessions as well as other material.

## THEORY OF FIRE SAFETY DESIGN

Effective fire safety in buildings goes beyond meeting codes. It requires a systematic and diligent approach on the part of the architect for fire prevention, protection and control in all the aspects of building design, construction and use (Malven, 1997). According to Ahiamba (1985), the rate of spread of fire depends on the fuel and available oxygen. Also it depends on the construction of the building. The rate of fire spread depends on the following:-

- **Combustibility**  
This is the rate at which a material burns. For example petrol has much higher combustibility than wood.
- **Flammability**  
Hydrocarbon gases are more flammable than hydrocarbon liquids. In the same way hydrocarbon liquid are more flammable than ordinary combustible. Example, cooking gas is more flammable than petrol or kerosene, and petrol is more flammable than wood.
- **Design and construction**  
A well designed and constructed building will help to reduce the rate of fire spread. For example a hostel building with a badly designed and constructed stairwell and no room compartmentalization will favour fire spread in the building from one floor to another.



- **Contents of building**

The material of furnishing (fuel) to a great extent determines the rate of fire spread. Timber furnishing and finish will favour fire spreading and its sustenance unlike steel which is considerably, the reverse.

## **CLASSES OF FIRE AND THEIR EXTINCTION**

Hassan (1999) classified fire into four classes:

- **Class A** is a type of fire involving burning materials e.g. wood, paper, textile and other combustible materials. Fire in this class are best extinguished by water agent in form of jet or spray, this blanket (fire blanket) can be used to cover the fire in an enclosure.
- **Class B** fire involves flammable substances e.g. petrol, kerosene, paint and other inflammable solvents. This class of fire is best extinguished with foam or dry powder, carbon dioxide (CO<sub>2</sub>).
- **Class C** is a type of fire involving combustible gases or liquefied petroleum gases in form of liquid or gas leak e.g. propane, butane, methane. This can be extinguished with foam, dry powder, and CO<sub>2</sub> water agent spray to the container.
- **Class D** is a type of fire involving metals e.g. calcium, potassium, aluminium e.t.c.
- Powdered granite, limestone, dry sand and dried powdered extinguisher are best used for this class of fire. Hassan (1999) further reiterates that electrical fire does not constitute a class of fire since any fire involving electricity may involve one of the classes of fire mentioned above.

## **PRINCIPLES OF FIRE SAFETY**

Every fire is somewhat unique. Still, design professionals can do a great deal to enhance their background in fire safety by knowing useful generalizations concerning the requirements of fire-safe buildings (Herbert, 1998). The fire safety principles are adopted primarily to protect life. Herbert (1998) summarized the principles as follows:

1. Management of fire safety;
2. Avoidance of outbreaks of fire;
3. Early detection of fire and early warning to staff and guests to facilitate an adequate response;
4. Compartmentalization of building and provision of escape routes, which are protected from fire and smoke;
5. Limitation of the development and spread of fire;
6. Containment of fire and smoke to the room where the fire originates;
7. Early suppression of fire, where this is feasible;
8. Effective evacuation procedures; and
9. Access and facilities for the fire service.



# **FIRE SAFETY MEASURES IN HOSTEL BUILDING**

Fire prevention measures are a key element in the fire safety management of hostels. This involves the identification and elimination of potential fire hazards both inside and outside the building.

## **Fire Doors**

Fire doors are important part of fire defence system in hostels and should normally be kept closed. The occupants should be made aware of the vital role which such doors play, and of the importance of not propping or wedging them open. This message should be emphasised by appropriate "Fire Door-Keep Shut" signs displayed on each fire door. In situations where it is necessary for operational reasons to hold open such doors, this should be done with electro-magnetic devices linked to an automatic alarm system. Such doors should be closed at night.

## **Means of Egress**

A means of egress is the path available for a person to leave a building, structure, or space. This route must be unobstructed, and doors along this route cannot be subject to locking from the side that people will be leaving. For example, the rear exit door of a building could require use of a key to get in from the outside for security reasons, but the door must always be open able from the inside without a key so that people can get out in an emergency. This is especially important during situations that may involve evacuation by a large number of people at the same time and/or panic-type situations. A means of egress consists of three parts: exit access, exit, and exit discharge. Exit access is the path from any location within a building to an exit. An exit is typically a door leading to the outside, or in a multi-story building, an enclosed exit stairway. Exit discharge is the path from the exit to the public way.

In most buildings, the way in is also the way out. People generally will leave a building the same way they came in since that is the familiar route. However, that is not always possible good for occupants' safety. A fire could occur at any location in a building. The path used for entry into a space may be blocked. Provisions should be made to aid the evacuation of occupant from the building to safety usually in hostel buildings with more than one floor occupants are typically required to use the exit stairways which leads to a safe place.

Persons who cannot use stairways, an alternative mean of egress is to be provided in the design of the building; in cases of mobile impaired occupants. Although most tertiary institution in Niger state lack this design consideration in the initial plan, more so in regards to achieving a well-planned design which consider sustainability as paramount the hostel buildings lack in this aspect as defined. When fire occurs in building, large quantities of smoke and gases are produced. Smoke and hot gases may travel considerable distances within a building and will present a direct threat to life. Visibility also is considerably reduced, thereby affecting the viability of escape routes within and from the building. It is



essential that escape routes are available to enable the occupants to reach a place of safety and that they are adequate and capable of being safely and effectively used at all times (Herbert, 1998). Special consideration should be given to accommodating and providing for the safe evacuation of people with disabilities. This may include providing accommodation in appropriate parts of the building, arrangements for giving warning to persons with hearing disabilities and provision of assistance in an emergency to persons with special needs (Herbert, 1998). In addition, security arrangements should not be such as to impede the escape of persons from the building in the event of an outbreak of fire. Basically, alternative escape routes should be available so that a person confronted by fire can escape in a direction which is away from the fire. Each storey of the building should be provided with at least two escape routes, except in the case of small premises which under certain conditions may be served by a single escape stairway. This provision is based on the possibility that, in the event of an outbreak of fire, one of the escape routes may become unavailable for use.

Alternative escape routes from a storey should be remote from, and independent of each other (Herbert, 1999). In addition to a minimum of two escape routes from every storey, the floor layout and occupant capacity will also influence the number of escape routes required for any situation. It is necessary to restrict the distance to be travelled along an escape route. The limitations on travel distance will depend on whether escape is possible in one direction or in more than one direction. The number of escape routes will also be influenced by the capacity of those routes to evacuate each area, taking into account the possibility of an escape route being unavailable for use as a result of the fire. A single escape route from a storey is only acceptable where there is little likelihood of this route being unavailable for use and where an alternative escape route cannot practicably be provided.

## **Escape Corridors**

Corridors which form part of an escape route should be constructed with 30 minutes fire resisting elements (Herbert, 1998). Doors opening onto escape corridors, other than a door from a toilet or bathroom which is not used for the storage of combustible materials, and is separated from the remainder of the building by fire resisting construction, should be fire resisting and self-closing.

## **Travel Distance**

For the purposes of escape, the travel distances along an escape route from any point in a building should be restricted to an extent which is dependent on the availability of alternative escape routes. For this purpose, a distinction is made between:

1. Travel from any point from which escape can be made in one direction only (sometimes referred to as dead-end travel).
2. Travel from any point from which escape can be made in more than one direction, by way of alternative escape routes. (Herbert, 1998).



Fire requires specific conditions to occur through a source of ignition. These conditions are inadvertently present in all buildings, as the by-product of design choices (Patterson, 1993). Hence fire can start at any time in a building depending on what caused it.

A careful study of hostels, private and public, has revealed that not much has been done in the articulation of fire safety in the design of hostel buildings in Niger state. Most hostels have only one entrance and exit in them, while due to security reasons; the burglary proofs in some constitute impediments in cases of fire outbreaks. Compartmentalization in the design of buildings was not employed, to help in the containment of fire spread. Also the number of storeys of some hostels makes evacuation of people difficult during fire incidents. In addition, building materials used in the construction of most of the hostels studied, are not fire resisting enough, rather will aid cases of fire.

The aim of this research is to identify and proffer an architectural design solution that can prevent ignition and spread of fire, and minimize damages in tertiary institution hostels in cases of fire outbreak.

In achieving this aim the following objectives will be pursued:

1. Identification of causes of fire in hostels
2. Identifying the effects of fire on health and safety of students in tertiary institution hostel buildings
3. Identification of best construction techniques proper for checking fire incidents.
4. Proffering solution for health and safety of student against fire outbreak.

## **RESEARCH METHODOLOGY**

The research is based on survey of fire safety measure in tertiary institution hostel buildings. The study thus, focuses on male hostels of public tertiary institution in Niger state. The targeted population were the student, porters, hostel securities, and hostel managers. The data for this study was collected from primary and secondary sources. The primary data was obtained using a well-structured questionnaire and observation schedule which were administered to students and the hostel management within the targeted population. Information were also collected through physical observation of five tertiary institution comprising of male hostels of the public tertiary institutions in Niger state namely; Federal University of Technology Minna male hostels, Ibrahim Badamasi Babangida University Lapai male hostel, Niger State Polytechnic Zungeru male hostel and Bida polytechnic male hostel. Observation schedule was used to check for fire safety precaution in the hostels; this formed a greater part of the research. According to Allen (1973) affirmation that if data cannot be obtained then there is no basis for conducting research.

The secondary data adopted in the study was obtained through literature review from relevant textbooks, journals, lecture notes, and online libraries. The secondary data was utilised to establish criteria and theories against which the primary data was measured. This study relied on structured survey of fire safety measures realised in the hostel buildings in the study area. 950 questionnaires were disseminated, 840 were returned but only 837 which



represent 88.1% were viable for analysis. Descriptive statistics were used for questions asked which have stringed variable; frequency and percentage table were used in presenting the data, while data with numerical variable were analysed using mean scores. Statistical package for social science (SPSS) software was used for analysis of the questionnaires. The viable questionnaire were coded in statistical package for social science data editor of which the descriptive statistics, mean score and ranking were performed on the obtained data. The result thus, were displayed in the production viewer, this were used in discussion of results from the various group of questions asked.

## DATA PRESENTATION AND RESULT DISCUSSION

Table 2: population target in the study area

Category	Frequency	Percentage
Students	810	96.8
Porters	7	0.84
Hostel security	11	1.31
Hostel managers	9	1.08
Total	837	100%

Source: field work (2015)

Table 1 shows the population target in the study area, 810 which represent 96.8% of the respondents are students staying within the hostel buildings, 1.31% of the respondent are securities positioned at the hostel buildings while 7 and 9 representing 0.84% and 1.08% respectively of the respondents are porters and hostel managers.

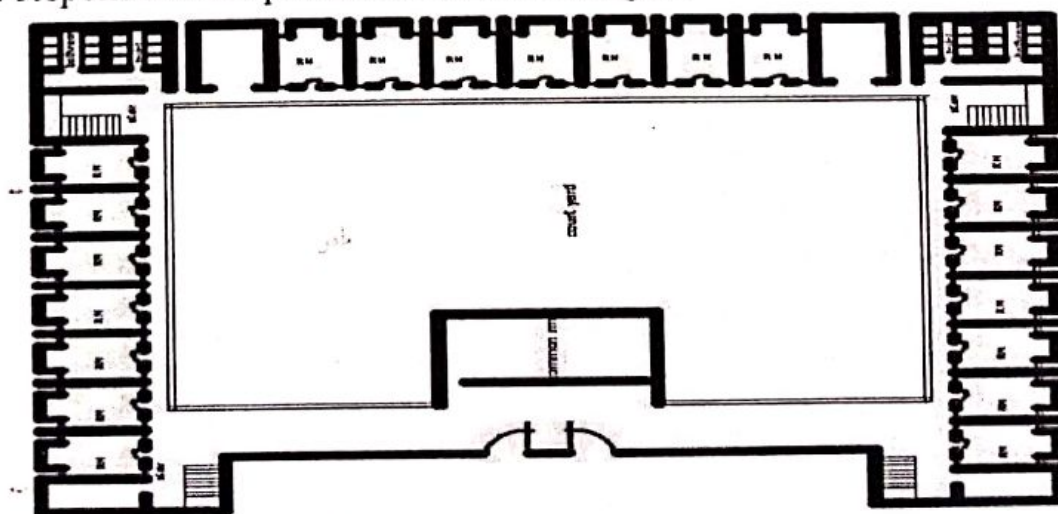


Plate 1: Ground Floor Plan of Male Hostel F.U.T Minna Gidan Kwano Campus.

Source: Field Work 2015





Plate 2: Corridors of Male Hostel F.U.T Minna Gidan Kwano Campus.  
Source: field work 2015



Plate 5: Corridor of Male Hostel Bedroom Of Male Hostel Niger State Polytechnic Zungeru.  
Source: Field Work (2015)



Plate 3: emergency stairs way of Male Hostel F.U.T Minna Gidan Kwano Campus  
Source: field work (2015)

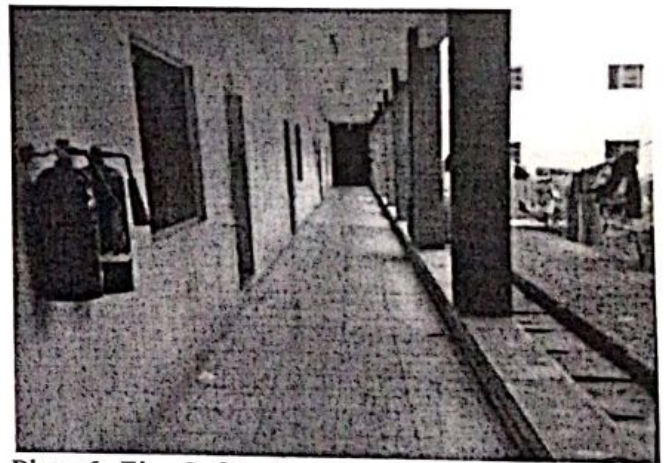


Plate 6: Fire Safety Equipment At Corridor Of Male Hostel Ibrahim Badamasi Babangida University.  
Source: Field Work (2015)



Plate 4: Bedroom of Male Hostel Niger State Polytechnic Zungeru  
Source: Field Work (2015)

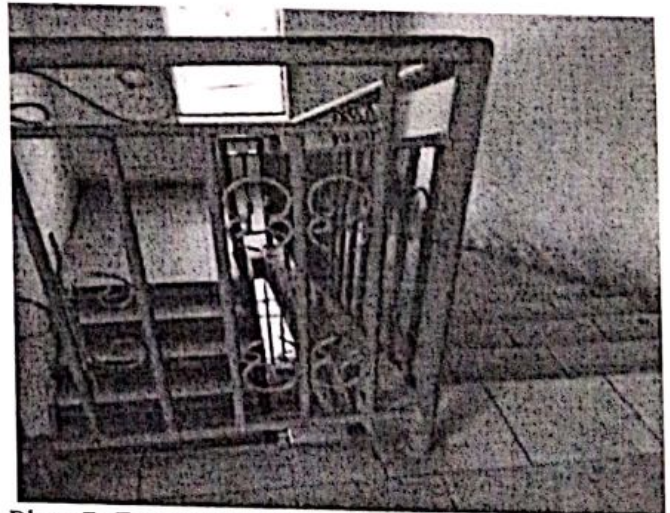


Plate 7: Emergency Stairway of Male Hostel Badamasi Babangida University  
Source: Field Work (2015)





Plate 8: Entrance of Male Hostel Federal Polytechnic  
Source: Field Work (2015)



Plate 9: Corridor of Male Hostel Federal Polytechnic Bida  
Source: Fieldwork (2015).



Category	Frequency	Percentage
Bungalow	1	20
1-2 floors	-	-
3-4 floors	4	80
Above 4 floors	-	-
Total	5	100%

Table 2: type of hostel building  
Source: field work (2015)

Table 2 shows that 80% of the hostel buildings fall within 3-4 floors, while hostel building such as bungalow and 1-2 floors are 20% and 0% respectively.

Category	Frequency	Percentage
1-2 years	368	43.9
3-4 years	427	51.0
Above 4 years	42	5.0
Total	837	100%

Table 3: frequency of years of occupancy in hostels  
Source: field work (2015)

The average number of year occupants had stayed in the hostel is presented in table 3, 427 and 368 respondents which represent 51% and 43.9% of the respondent had stayed within the hostel between 3 to 4 years and 1-2 years respectively while 42 respondent representing 5% of the respondents had stayed in the hostel above 4 years. This however, implies that the data is reliable for analysis.

Category	Frequency	Percentage
1-4	140	16.7
5-8	627	74.9
8 and above	70	8.3
Total	837	100%

Table 4: frequency of occupants per room in hostels  
Source: field work (2015)



Table 4 shows that 627 of the respondents which represent 74.9% of the total response confirm that, maximum occupancy rate ranges between 5-8 persons in each hostel room while 16.7% and 8.3% represents 1-4 and above 8 persons per room respectively which implies that the number of occupancy in each room result to influx of the hostel building above the capacity it is being built to serve.

Category	Frequency	Percentage
BELOW TERTIARY EDUCATION	8	0.9
PRE-DEGREE	81	9.7
OND	123	14.7
HND	190	22.7
B.TECH	430	51.3
M.TECH	5	0.60
PHD	-	-
<b>Total</b>	<b>837</b>	<b>100%</b>

Table 5: type of academic study of the occupants  
Source: field work (2015)

Table 5 presents the study type of the respondents in the hostels, 51.3% of the respondents are at bachelor degree level, 22.7% and 14.7% of the respondent are at HND and OND level while 9.7% and 0.6% of the respondents are at pre-degree and master's degree level.

Category	Frequency	Percentage
Yes	88	10.5
No	749	89.5
<b>Total</b>	<b>837</b>	<b>100%</b>

Table 6: witness of fire incident  
Source: field work (2015)

As represented in table 6 above, 749 of the respondents which represent 89.5% of the response have never witnessed any fire incidence while 88 respondents representing 10.5% of the response had witnessed a fire incident.



Category	Frequency	Percentage
Major	27	3.2
Minor	810	96.8
Total	837	100%

Table 6: nature of fire occurrence  
Source: field work (2015)

As presented in table 6, 810 of the respondents representing 96.8% response confirms that only minor fire incident had occurred in the hostel building which basically involves a particular room or section in the hostel building, while the major incidents are confirmed by 3.2% of the response.

#### Fire Safety Measures, Functionality and Awareness Occupants

Category	Number	Sum	Mean	Rank
Portable Fire Extinguisher	9	49	5.4	2
Fire Alarm	7	27	3.9	4
Fire Exits	7	20	2.9	5
Emergency Lighting	5	11	2.2	6
Flame Detector	-	-	-	-
Smoke Detector	-	-	-	-
Fire Safety Sign	4	56	14	1
Heat Detector	-	-	-	-
Fire Hose Reel	-	-	-	-
Fire Bucket	9	45	5	3
Dry Riser	-	-	-	-
Fusible Hydrant	-	-	-	-
Wet Riser	-	-	-	-
Dry Riser	-	-	-	-
Halon Gas System	-	-	-	-
Sprinkler System	-	-	-	-
<b>Total</b>	<b>41</b>	<b>155</b>	<b>33.4</b>	<b>-</b>

Table 7: functional safety equipment  
Source: field work (2015)



Category	Number	Sum	Mean	Rank
Destruction Of Properties	9	49	5.4	1
Structural Defect	9	27	3.0	2
Injury	8	20	2.5	3
Death	5	11	2.2	4
Total	31	107	13.1	-

Table 8: damages caused by fire  
Source: field work (2015)

Table 8 shows the mean score of respondents' response to the degree of damages caused by fire incident. Destruction of properties rank the highest while structural defect ranks second respectively. However, injury and death ranks lowest.

Category	Frequency	Percentage
Yes	83	9.9
No	754	90.0
Total	837	100%

Table 9: Awareness of safety practises  
Source: field work (2015)

As shown in table 9, 754 respondents which represent 90% of the response are not aware of the fire safety practice, while 83 respondents representing 9.9% are aware of fire safety measures. Thus this shows that a lot of occupant may be at risk when a fire incidence occurs. Furthermore table 10 shows also the awareness of occupant to safety equipment provided in the hostel building, 54.5% of the responses from the respondent are aware while the other 45.5% of the response from the respondent are not aware of the equipment provided.

Category	Frequency	Percentage
Yes	456	54.5
No	381	45.5
Total	837	100%

Table 10: fire safety measures and awareness of safety equipment in the hostel buildings  
Source: field work (2015)



Category	Number	Sum	Mean	Rank
Size Of Building	3	40	13.3	2
Complexity Of Building	7	205	29.2	3
Type Of Building	8	134	16.8	4
Financial Capability Of Building Management	5	458	91.6	1
Total	23	837	150.9	

Table 11: factors affecting incorporation of fire safety devices in hostel buildings  
Source: field work (2015)

There are certain factors that affect the Integration of fire safety devices which is presented in table 11 above, financial capability of the building management ranks high in the mean score while building type ranks the lowest. This thus shows how the presence of fire safety devices in hostel building is being influenced. Furthermore presence of safety measure influences are analyzed in table 12, the mean score of the factors shows that ignorance of building professional ranks the highest. This is because more attention is paid on provision of accommodation while safety is neglected.

Category	Number	Sum	Mean	Rank
Initial cost	7	250	35.7	1
Ignorance of the building professionals	9	498	55.3	3
Attitude of end users	3	22	7.3	4
Maintenance cost	3	67	22.3	2
Total	22	837	120.6	

Table 12: factors affecting incorporation of safety in hostel buildings  
Source: field work (2015)

Category	Availability	Protectors
Emergency doors	11	6
Doors	298	0
Window	596	596

Table 13: presence of window and door protectors in the hostel buildings  
Source: field work (2015)

As presented in table 13 most of the emergency doors were locked with keys and door protector for security purpose of which in return pose a risk in case of fire incident, while most of the windows are also secured with window protector. But the door at the entrances to the hostel and rooms do not have protect therefore they do not hinder escape from room and main entrance.



Category	Availability	functionality	Remark
Portable Fire Extinguisher	12	5	Most are expired and not replaced
Fire Alarm	7	3	Most are not active
Fire Exits	11	5	Most are located at close to an open drainage while other are locked
Emergency Lighting	11	0	Mostly natural lighting from court yard
Flame Detector	-	-	-
Smoke Detector	-	-	-
Fire Safety Sign	4	3	Most are not visible enough
Heat Detector	-	-	-
Fire Hose Reel	-	-	-
Fire Buckèt	9	2	Most are still functional
Dry Riser	-	-	-
Fusible Hydrant	-	-	-
Wet Riser	-	-	-
Dry Riser	-	-	-
Halon Gas System	-	-	-
Sprinkler System	-	-	-
<b>Total</b>	<b>49</b>	<b>16</b>	-

Table 14: presence of fire safety measures in hostel buildings  
Source: field work (2015)

In other provide sufficient and safe egress from a building, with a minimum of effort and delay, and to present a minimum of obstruction in an exit path. Herbert (1998) stated that an external escape route is acceptable as an alternative means of escape only where:

1. A suitable alternative internal protected escape stairway cannot be practicably provided;
  2. The height to the floor of the top storey does not exceed 10 m above ground level.
- Table 14 shows that fire exit mostly locked with chains while emergency lighting are mostly natural lighting from court-yard but the electrical fitting for emergency light



are non-functional. This implies that most safety measure attention is paid to provision of a security by locking the means of egress and protecting it with lock door protectors. But few hostel building in Niger state provided emergency lighting usually with the use of court-yard and atrium of which can be considered not effective enough most especially at night.

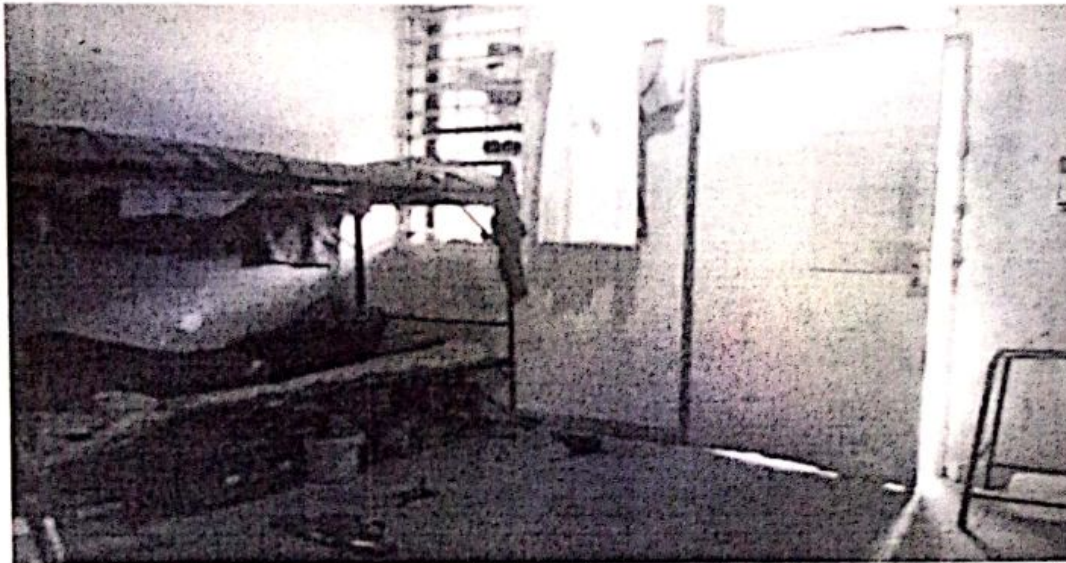


Plate 8: Bedroom Arrangement Of The Male Hostel F.U.T Minna Gidan Kwano Campus.  
Source: Field Work (2015)

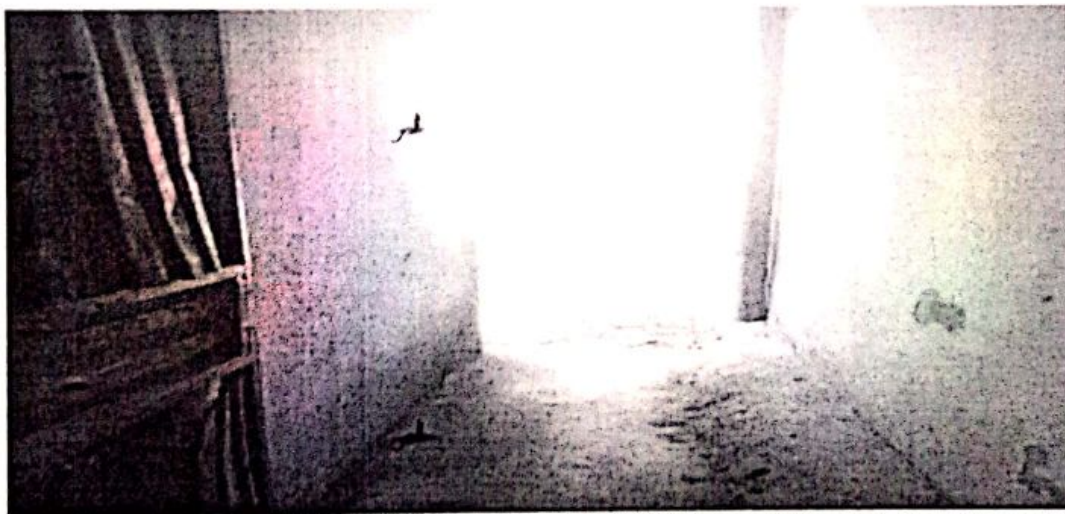


Plate 9: Emergency Exit Of The Male Hostel F.U.T Minna Gidan Kwano Campus.  
Source: Field Work (2015)

The width of escape stairways will depend on the number of persons likely to use them but should not generally be less than 800 mm (Herbert, 1998). A stairway according to Herbert (1998) may be acceptable as an escape stairway where:

1. It is a protected stairway and leads directly to a place of safety at ground floor level;
2. The width of the stairway and dimensions of steps are adequate for the purposes of escape;
3. The stairway is of sound construction and is capable of affording safe passage for the users of the building;
4. The pitch of the stairway does not exceed 38 degrees and is constant throughout its length and the number of treads in a flight is not more than 16 or less than 3.



## CONCLUSION AND RECOMMENDATION

Fire is an extremely destructive force that can devastate the environment, people, property and buildings, and its effects can continue for years after the event. There is little doubt that we all need to do everything we can to prevent fire and protect human life and properties. Legislation goes some way to preventing fire and protecting us from the effects. However the use of approved products and design techniques that have been certified and recognised to solve this fire safety issue not only give confidence of safety but also are sustainable in a long run. The current Regulatory Reform (Fire Safety) Order should require planners to make sure that a rigorous risk assessment has been conducted to ensure the safety of the occupants and users of hostel buildings. The use of building materials which are sustainable with respect to fire resistant capacity should be encouraged at the initial stage of a hostel building design, critical fire safety measures also taken into consideration can significantly ease this process. In providing a safer and more fire-free environment will on a long run achieve a safer environment.

Recommendations for safety against fire in the hostel building include;

- Hostel building management of every institution should ensure that the student accommodations within the school are all equipped with the necessary active and passive fire safety equipment for the safety of the students which is paramount. Furthermore, the equipment should be regularly checked to ensure good functional condition.
- Student should be orientated on how to prevent fire from occurring and on what to do in cases of fire incident.
- Government organisation should constantly ensure to supervise hostel buildings during planning, ensuring that they meet up to the fire safety requirements and code.

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