THINK INDIA JOURNAL

ISSN: 0971-1260

Vol-22-Issue-14-December-2019

Fire Safety Assessment of Government Colleges in the State of Manipur in India

Dr. Jangkholun Mate

Assistant Professor, Churachandpur College, Churachandpur, Manipur – 795128

Email: dr.j.mate@gmail.com

Abstract:

The purpose of the study included, (i) the level of preparedness of the government colleges of Manipur to counter fire calamities with regards to building structural design, electrification, building and electrical materials installed, (ii) the fire safety system or measures put in place in the government colleges of Manipur, (iii) the standard of management and maintenance of fire safety system in the government colleges of Manipur, (iv) the overall preparedness of the government colleges of the state to meet fire and life safety Provisions, To answer this issues, descriptive and analytical method of research was adopted. The universe of the study comprised of 359 Head of Departments (HODs) from 30 government College both general and professional colleges. The sample of the study included 108 HOD of various departments from different government college which was drawn randomly from the universe. Self-developed questionnaire was used as the tool for gathering pertinent data. Appropriate statistical techniques were used to analyse the categorised data and interpretation of the statistical indices were undertake. Main finding of the study (i) lacking on the part of the government colleges of preparedness toward fire safety. (ii) absence of fire safety system in all the government colleges. (iii) No proper management and maintenance of fire safety system. (iv) low overall preparedness of the government colleges of the state to manage the fire crisis.

KEYWORDS: Fire Safety, Government College, Fire Safety System, Fire Crisis, Management and Maintenance of Fire Safety.

1.1. BACKGROUND:

According to BBC News (May 26, 2019) reported that at least 20 people, most of them students attending private tuition classes, have died in a fire in India. Students were seen jumping and falling from the commercial building in the western city of Surat, Gujarat as black smoke billowed from windows. The fire is believed to have been started by an electrical fault in the air conditioning, At least 20 other people suffered serious injuries in the fire and were being treated in hospital in Gujarat. All of the dead were younger than 20, and many were trapped because the fire began near a staircase. The witnesses claimed that the fire brigade arrived at the spot 45 minutes late.

Mukesh Singh Sengar, NDTV (June 08, 2019), reported 3, Including Two Children, Dead after a fire broke out at a private school in Faridabad near Delhi. The fire started in a clothes warehouse under the school early this morning in Faridabad's Dubua Colony. The cause is not yet known. Like Surat, the firefighters were late in reaching the spot, locals

ISSN: 0971-1260

Vol-22-Issue-14-December-2019

alleged. The narrow lanes made the fire brigade's job difficult. The three people killed include a woman who taught at the school and two of her children. The school was closed for the summer vacation but the family were living inside. They were brought out with severe burns through the roof by neighbours but died at the hospital. Two people were also injured while trying to save them.

News18 (February 11, 2010), "12 school children killed in Arunachal hostel fire," at least 12 school children were charred to death and eight injured in a massive fire that broke out at a private hostel in Arunachal Pradesh. A police spokesperson said that the fire broke out around midnight at a hostel built with bamboo and hay at Palin in Kurung Kummpy district, 260 km north of state capital Itanagar. There were 62 students of a local branch of the Don Bosco chain of schools staying at the privately-run hostel. The fire was started accidentally as students were studying under candle light since there was no power supply.

Wikipedia (2004), Kumbakonam School fire, the 2004 Kumbakonam school fire accident happened in a school in Kumbakonam in the Thanjavur district of the Indian state of Tamil Nadu. A total of 94 students of the primary section of the Krishna English Medium School were burnt to death in their classroom as the thatched roof caught fire on 16 July 2004. The accident was one of the four largest fire accidents and the largest school accident in Tamil Nadu's history, as well as the second largest school fire in India in terms of casualties.

BBC News (18 September 2019), At least 27 people, many of them children, have been killed in a fire at a boarding school in a suburb of the Liberian capital Monrovia. The fire ws believed to have broken out in the early hours of the morning, when Koranic school students were sleeping in a building near their mosque. Police spokesman Moses Carter told Reuters news agency that the fire was caused by an electrical problem, but investigations are continuing. Eyewitness Pastor Emmanuel Herbert told the BBC that he woke up to sounds of the fire and raised the alarm. But he said he could not get into the building because there was only one entrance, which was blocked.

1.2. Previous Studies

Hassanain, M. A. et al. (2017) study had revealed that fire safety attributes were found to be available, though many require restoration as per the requirements of current fire safety codes and standards. It was also noted that older buildings lacked more fire safety attributes. Old/existing buildings that are assessed based on current standards may lead to a conclusion that the facility is ''substandard" or of ''low quality" in its safety performance.

Marin, L. S. et al. (2019), in their study, found out that the safety climate scores for college students enrolled in chemistry laboratories resulted in values from 2.51 to 2.98 on a scale of 1–4, with 2.5 indicating the scale midpoint and 1 indicating the lowest perception of safety. The employee's perceptions on fire safety were high. This study showed the management commitment to safety lowest.

Chixiang Ma, et al. (2012) study revealed that in addition to the readers, the library staffs were surveyed more than 80% accepted fire-protection training possessing safety

ISSN: 0971-1260

Vol-22-Issue-14-December-2019

awareness. Automatic sprinkler system is equipped in the library. The library is equipped with new temperature-smoke detector which can do rapid response. equipped with large amount of books, crowds of people, 1st, 3rd and 4th reading room were the key regions of fire-prevention and safety evacuation; The results indicated that the fire-protection system in 4thReading-Room could meet requirement of safety evacuation; By the analysis of performance-based fire-protection and safety evacuation design of the college library, it was inferred that the fire-protection safety systems could meet the demand.

Li, M., et al. (2018) study concluded that exit of the third floor is the most dangerous area for safe evacuation. Its congestion time accounts for 94.3% of the required safe evacuation time. The speed of safe evacuation is significantly reduced because of the congestion. The main reason is the large population density and the use of shared stairs. Congestion is the main problem of safe evacuation.

Fennelly, L. J., & Perry, M. A. (2017) after extinguishers have been installed, a regular annual program of inspection and maintenance must be established. A good policy is for safety/security personnel to check all devices visually once a month and to have the extinguisher service company inspect them at least annually twice a year. Smoke alarms should be tested and cleaned periodically.

Meng, D., et al. (2016) study revealed that colleges are devoted to improve the ability of preventing and dealing with the fire risks in various ways. However, many objective reasons for accidents of campus fire are still exist. College students' awareness of the fire is still in the primary stage.

2. OBJECTIVES OF THE INVESTIGATION

2.1. To investigate the fire safety of the infrastructural components of the government colleges of Manipur in terms of building structural design, electrification, building and electrical materials used.

2.2. To study the fire safety system put in place in the government colleges of Manipur

2.3. To investigate the management and maintenance of fire safety system in the government colleges of Manipur.

3. RESEARCH QUESTIONS

3.1. What was the level of preparedness of the government colleges of Manipur to counter fire calamities with regards to building structural design, electrification, building and electrical materials installed?

3.2. What was the fire safety system or measures put in place in the government colleges of Manipur? Or what was the level of fire safety measures of the government college?

3.3. What was the standard of management and maintenance of fire safety system in the government colleges of Manipur?

ISSN: 0971-1260

Vol-22-Issue-14-December-2019

3.4. What is the overall preparedness of the government colleges of the state to meet fire and life safety Provisions?

4. DESIGN AND METHODOLOGY OF THE STUDY.

4.1. Method of the Study

Descriptive and analytical method was adopted in the present study as they were found to be most suitable.

4.2. Universe of the Study

The universe of the study comprised of 359 Head of Departments (HODs) from 30 government college both general and professional colleges (Source: College Statistics 2015-16 & official web of Directorate of Higher Education, Manipur).

4.3. Sample of the Study

Sample of the study was drawn randomly by using stratified sampling technique and also selectively by using purposive sampling technique as shown in Table 1 below;

Table 1: The sample of the study were consisted of following

Sl. No.	Types of college	No. of College	No. of HODs/Head of the college	Sample
1	College with multi-departments*	26	4 each	104
2	College without multi-department**	4	1 each	4
			Total	108

* Sample was randomly drawn by using Stratified sampling technique.
** Sample was drawn by using purposive sampling technique.

4.4. Study Tool

The researcher had developed an online questionnaire consisting of 27 items in 3 components of fire safety system as shown in the Table 2 below;

Table 2: Components of fire safety system

Sl. No.	Component	Nos. of Items
1.	Building and electrical materials	12
2.	Fire safety system or measures	8
3.	Management and maintenance of fire safety system	7
	Total	27

4.5. Analysis:

After Data entry in MS-Excel, the entered data were given statistically treatment and the total scores, Mean, Standard Deviation, and score percentage for each items were

ISSN: 0971-1260

Vol-22-Issue-14-December-2019

computed. Further, the Gross Total Scores, Mean, Standard Deviation, and Score Percentage for each component of the fire safety system were computed. Thereafter, the values were interpreted and inferences were drawn.

5. RESULTS OF THE STUDY:

The following are the results of the study according to the sequence of questions:

5.1. Results of the first question: *What was the level of preparedness of the government colleges of Manipur to counter fire disaster with regards to building structural design, building and electrical materials installed?*

To answer this question, M, SD, Percentages and Total scores of items about the preparedness of the government colleges of Manipur to counter fire disaster in respect to building structural design, building and electric materials, etc., was computed, the result is shown in Table 3.

Table 3: Showing M, SD, Scores, Percentage and Degree of preparedness of government colleges

Item No.	Statement	M	SD	Score	%	Level of Fire Safety
i.	All classroom doors are fire exit doors	0.11	0.57	12	2.22	Very Low
ii.	The width of all the classrooms doors are minimum 3ft width or above.	4.81	0.95	520	96.30	Very High
iii.	All classrooms with the capacity of 100 students and above have two doors	1.36	1.07	56	10.37	Very Low
iv.	Auditorium/Indoor Stadium/Multipurpose Hall/Library have minimum 4 doors or above.	2.64	1.39	204	37.78	Low
v.	The doors of Auditorium/Indoor Stadium/Multipurpose Hall have minimum 2 doors with minimum 6 ft. width or above.	2.80	1.08	243	45.00	Moderate
vi.	Library have minimum 2 doors.	1.30	0.90	32	5.93	Very Low
vii.	The doors of the Library are minimum 6 ft. width or above.	1.22	0.63	16	2.96	Very Low
viii.	The corridors are minimum 6ft. width or above	4.21	0.92	431	79.81	High
ix.	The college building materials used were non-combustible.	0.28	0.53	0	0	Nil
x.	The college building assemblies were fire-resistive.	0.28	0.53	0	0	Nil
xi.	The college building walls were made up of fire resistant materials.	0.35	0.62	0	0	Nil
xii.	The electrical wires, appliances, etc.	1.63	0.9	54	10	Very Low

ISSN: 0971-1260

Vol-22-Issue-14-December-2019

	installed in the college buildings are made up of fire resistant materials		9			
	Total	14.57	5.79	1568	24.29	Low

Analysis of the above Table showed a low level of preparedness of the government colleges of Manipur to counter fire disaster in respect to building structural design, building and electric materials, etc., which has come at a Total Score of (1568) out of 6480, Mean of (14.57), Standard Deviation of (5.79) and Percentage of (24.29). The researcher found out that there was total lacking on the part of the government colleges of preparedness toward fire and life safety.

5.2. Results of the second question: *What was the fire safety system or measures put in place in the government colleges of Manipur? Or what was the level of fire safety measures of the government college?*

To answer this question, M, SD, Score, Percentages and level of fire safety system or measures put in place in the government colleges of Manipur was computed, the result is shown in Table 4.

Table 4: Showing M, SD, Score, Percentages and level of fire safety system or measures put in place in the government colleges

Item No.	Statement	M	SD	Score	%	Level of Fire Safety
i.	Fire alarm/notification system installed	0.00	0.00	0.00	0.00	Nil
ii.	Smoke detector/fire detection system installed in all the building including classrooms, halls and library.	0.00	0.00	0.00	0.00	Nil
iii.	Portable fire extinguisher put in place in all the building including classrooms, halls and library.	0.15	0.76	16	2.96	Nil
iv.	Automatic sprinklers installed in all the building including classrooms, halls and library.	0.00	0.00	0.00	0.00	Nil
v.	Hose reel/standpipe installed in all the building including classrooms, halls and library.	0.00	0.00	0.00	0.00	Nil
vi.	Emergency escape lighting (installed in all the building including classrooms, halls and library.	0.00	0.00	0.00	0.00	Nil
vii.	Smoke management system installed in all the building including classrooms, halls and library.	0.00	0.00	0.00	0.00	Nil
viii.	Smoke management system installed in all the building including classrooms, halls and library.	0.00	0.00	0.00	0.00	Nil

ISSN: 0971-1260

Vol-22-Issue-14-December-2019

ix.	Exit signs installed in all the building including classrooms, halls and library.	0.19	0.78	20	3.70	Very Low
	Total	0.30	1.52	32	0.74	Very Low

Analysis of the above Table showed the level of fire safety system put in place in the government colleges of Manipur which has come at a Total Score of (32) out of 4320, Mean of (0.30), Standard Deviation of (1.59) and Percentage of (0.74). The researcher found out that there was total almost absence of fire safety system in all the government colleges.

5.3. Results of the third question: *What was the standard of management and maintenance of fire safety system in the government colleges of Manipur?*

To answer this question, M, SD, Score, Percentages and standard of management and maintenance of fire safety system in the government colleges of Manipur was computed, the result is shown in Table 5.

Table 5: Showing M, SD, Percentage standard of management and maintenance of fire safety system in the government colleges of Manipur

Item No.	Statement	M	SD	Score	%	Level of Fire Safety
i.	The college have proper fire safety plans	0.11	0.57	12	2.22	Very Low
ii.	The college have proper fire evacuation/emergency plan	0.00	0.00	0	0.00	Nil
iii.	The college authority conducts fire safety inspections of fire safety equipment's', systems, and functions on a regularly basis.	0.00	0.00	0	0.00	Nil
iv.	The college have fire wardens.	0.00	0.00	0	0.00	Nil
v.	The college organizes fire drills regularly.	0.00	0.00	0	0.00	Nil
vi.	The college conducts programs and campaigns to raise awareness about fire safety.	0.00	0.00	0	0.00	Nil
vii.	The college conducts programs and campaigns to raise awareness about fire safety.	0.00	0.00	0	0.00	Nil
viii.	The college authority adopts necessary measures to maintenance the exit route.	0.00	0.00	0	0.00	Nil
	Total	0.33	1.55	36	0.95	Very Low

Analysis of the above Table showed the level of standard of management and maintenance of fire safety system in the government colleges of Manipur which has come at a Total Score of (36) out of 3780, Mean of (0.33), Standard Deviation of (1.55) and

ISSN: 0971-1260

Vol-22-Issue-14-December-2019

Percentage of (0.95). The researcher found out that the standard of management and maintenance of fire safety system in the government colleges of Manipur almost nil.

5.4. Results of the fourth question: *What was the overall preparedness of the government colleges of the state to meet fire and life safety Provisions?*

To answer this question, M, SD, Percentages and Total scores of the overall preparedness of the government colleges of the state to meet fire and life safety Provisions was computed, the result is shown in Table 6.

Table 6: Showing M, SD, Score, Percentage the overall preparedness of the government colleges of the state to meet fire and life safety Provisions

Item No.	Statement	M	SD	Score	%	Level of Fire Safety
i.	Level of preparedness of the government colleges of Manipur to counter fire disaster with regards to building structural design, building and electrical materials installed	14.57	5.79	1568	24.29	Very Low
ii.	Fire safety system or measures put in place in the government colleges of Manipur	0.30	1.52	32	0.74	Very Low
iii.	Standard of management and maintenance of fire safety system	0.33	1.55	36	0.95	Very Low
	Total	0.79	1.46	1636	11.22	Very Low

Analysis of the above Table showed the level of overall preparedness of the government colleges of the state to meet fire and life safety provisions, which has come at a Total Score of (1636) out of 14580, Mean of (0.79), Standard Deviation of (1.46) and Percentage of (11.22). Thus, the study found out a very low overall preparedness of the government colleges of the state to manage the fire crisis.

6. DISCUSSION

The study concluded that there exist under preparedness of the government colleges of Manipur to mitigate the fire crisis. Thus, huge majority of the government colleges in the state are critically exposed to the fire devastation. Therefore, it is a high time that the government colleges and the state government come up with fire safety guidelines and provisions, so that when such crisis occur life and properties are preserved.

REFERENCES

[1] Chixiang, M., et al. (2012). Analysis of Performance-based Fire Safety Evacuation in A College Library. *Procedia Engineering*, 43, 399–406. http://doi:10.1016/j.proeng.2012.08.069

ISSN: 0971-1260

Vol-22-Issue-14-December-2019

[2] Fennelly, L. J., & Perry, M. A. (2017). Fire Protection, Emergency Management, and Safety. *Physical Security: 150 Things You Should Know*, 115–157. http://doi:10.1016/b978-0-12-809487-7.00004-8

[3] Hassanain, M. A., et al. (2017). A ranking system for fire safety performance of student housing facilities. *Safety Science*, 92, 116–127. http://doi:10.1016/j.ssci.2016.10.002

[4] Li, M., Zhu, et al. (2018). Research on Fire Safety Evacuation in a University Library in Nanjing. *Procedia Engineering*, 211, 372–378. [online]. Use the DOI:10.1016/j.proeng.2017.12.025

[5] Maluk, C., et al. (2017). The potential of integrating fire safety in modern building design. *Fire Safety Journal*, 88, 104–112. http://doi::10.1016/j.firesaf.2016.12.006

[6] Marin, L. S., et al., Chemistry laboratory safety climate survey (Class): A tool for measuring students' perceptions of safety, (2019). Journal Chemical Health Safety, 1871-5532. http://doi:10.1016/j.jchas.2019.01.001

[7] Meng, D., et al. (2016). Survey and Countermeasure Discussion of College Students' Campus Fire Safety. *Procedia Engineering*, 135, 25–28. http://doi:10.1016/j.proeng.2016.01.074

[8] BBC News, India tuition centre fire kills 20 in Gujarat state, 25 May 2019, Retrieved from https://www.bbc.com/news/world-asia-48395247

[9] BBC News, Liberia school fire leaves many children dead near Monrovia in Paynesville, Liberia, 18th September, 2019, Retrieved from: https://www.bbc.com/news/world-africa-49743937

[10] IndiaToday, Surat fire: Several teenagers among 21 dead, coaching centre owner arrested, May 25, 2019. Retrieved from https://www.indiatoday.in/india/story/surat-fire-accident-news-coaching-centre-gujarat-1534340-2019-05-25

[11] International Code Council Inc., 2018 International Fire Code, Published on 31st August, 2017, [online] Retrieved from: https://codes.iccsafe.org/content/IFC2018/CHAPTER-9-FIRE-PROTECTION-AND-LIFE-SAFETY-SYSTEMS

[12] Mukesh Singh Sengar, NDTV, 3, Including Two Children, Dead in Fire at School in Faridabad near Delhi, June 08, 2019, Retrieved from: https://www.ndtv.com/india-news/three-including-two-children-dead-in-fire-at-school-in-faridabad-near-delhi-2050021

[13] News18, 12 school children killed in Arunachal hostel fire, February 11, 2010, Retrieved from: https://www.news18.com/news/india/bosco-death-don-bosco-fire-333352.html

[14] Wikipedia, 2004 Kumbakonam School fire, Retrieved from: https://en.wikipedia.org/wiki/2004_Kumbakonam_School_fire