International Journal of Innovative Research in Arts, Education and Technology | IJIRAET
p-ISSN: 2682-6216 | e-ISSN: 2682-5880
Volume 3, Number 1 February, 2025

Challenges of Safety in National DevelopmentHairdo

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Article DOI: 10.48028/iiprds/ijiraet.v3.i1.12

Abstract

Safety is essentially regarded as the protection of lives and property, as well as the safeguarding of assets within the confines of a specified domain. This entails the reduction of causality to the barest minimum in the face of activities or the result of no casualties in the operations involved without experiencing downtime. While safety is important in our everyday lives, the interface between the government of the day, relevant security agencies, and other stakeholders cannot be overemphasized, as this helps put in place the measures for effective management and smooth operations of all activities within the vicinity considered. This work is an analytical work on some incidents across Nigeria between November 2020 and August 2021.

Keywords*: Safety, National Development, Operations Management, Monitoring, Surveillance, Human Factors.*

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Background to the Study

Safety at various levels and stages of all activities is of great concern. This cannot be overemphasized, particularly with regards to national development. The absence of safety cannot lead to genuine growth and development in the community or system involved. This is very important in the operational management of all events or activities. While human factors are needed to ensure adequate monitoring and surveillance in operational management, this cannot take place without safety considerations. Thus, systems take into consideration the integrity management of their operations. This work shall discuss these fundamental segments of national development, taking into consideration market fire incidents in Nigeria within a duration.

Literature Review

OSH (2022), Safety is traditionally seen as accident prevention, i.e., avoiding unwanted events from occurring. Safety can also be seen as a basic value in the workplace. In the continuously changing working life and working environment, safety needs to be improved all the time. Reaching the desired safety level requires continuous work at both the management and operational levels. Balderson (2016), Safety is often defined as the inverse of risk: the lower the risk, the higher the safety. ASSE (2015), Safety = the control of recognized hazards to achieve an acceptable level of risk. ISO/IEC (2014), Safety = freedom from risk which is not tolerable. Safe = the state of being protected from recognized hazards that are likely to cause harm. Hollnagel (2014), Safety is the presence of capacities, capabilities, and competencies to ensure as many positive outcomes as possible.

Dekker (2014), safety is an outcome of top-down ethical responsibility. Leveson (2011), safety is a system property arising from interactions and controllable through the enforcement of constraints. Although Sinnott and Towler (2012), state that any organization has a legal and moral obligation to safeguard the health and welfare of its employees and the general public. Safety is also good business; the good management practices needed to ensure safe operation will also ensure efficient operation. Also, Walas (1990), states that safety factors should not be used to mask inadequate or careless design work. The design should be the best that can be made in the time economically justifiable, and the safety factors should be estimated from a careful consideration of all factors entering into the design and the possible future deviations from the design conditions.

In addition, Occupational Safety and Health explains that improving safety entails having a safety culture, which is created and nurtured mostly through unconscious socialization processes. It is often regarded as a social construction. Hence, safety culture should correspond to a set of beliefs, perceptions, and attitudes that reflect the importance that individuals in the organization attribute to safety, for themselves at the personal level, and for the safety of others. However, safety is not a stable value. It needs not only to be maintained but also to be improved all the time. Thus, the safety culture indicates how safety practices are actually being performed in a workplace, while the safety culture also refers to the ways in which an organization's informal aspects can influence occupational safety and health in a positive or negative way.

Ways of Improving Safety

i. Learning from accidents and near misses.
ii. Training for safe working methods.
iii. Measuring safety.
iv. Management's commitment to safety.
v. Workers' commitment to safety.
vi. Zero Accident Vision.

Dmytro (2024), A safety management system is a comprehensive and systematic approach to managing safety risks in the workplace. It includes all the necessary operational structures, accountabilities, policies, and procedures. The core safety management system's purpose is to manage and mitigate safety risks, ensure regulatory compliance, promote a safety culture, and protect the health and well-being of workers. However, its focus and implementation can differ between industries due to the unique risks and operational challenges they face. A few examples are outlined below:

i. In manufacturing, the safety management system addresses risks related to machinery operation, chemical handling, and ergonomics.
ii. In energy, including oil and gas, the safety management system addresses risks associated with drilling, production, and the transportation of hazardous materials.
iii. In construction, the safety management system focuses on preventing accidents related to heavy machinery, falls, and hazardous materials.
iv. In aviation, the safety management system is crucial for managing risks related to flight operations, maintenance, and ground handling.
v. In healthcare, the safety management system focuses on patient safety, infection control, and the safe handling of medical equipment and hazardous substances.

Parker (2024), the safety management system is a structured approach to safety risk management that systematically identifies, assesses, and controls risks. Having a system in place provides a framework for monitoring performance and creating a culture where safety is a shared responsibility. By integrating safety practices into every aspect of an organization's operations, the safety management system helps prevent accidents, injuries, and potential losses.

Benefits of using a Safety Management System

Some of the benefits of using a safety management system are outlined below:

i. Enhanced compliance
ii. Risk reduction
iii. Improved safety culture
iv. Operational efficiency

Incident report system (2024) A Safety Management System provides organizations with a framework to improve employee safety and health, reduce workplace risks, and create better, safer working conditions. The development and implementation of a comprehensive Safety Management System will support continual improvement and enable an organization to

develop and maintain a strong safety culture. Thus, the formal and organization-wide approach to managing safety risk and guaranteeing the efficacy of safety risk controls is known as a safety management system (SMS). It consists of processes, practices, and policies for managing safety risks.

Bamgbose (2022) states that national development is measured in terms of the qualitative advancement of the lives of the citizens of a country. National development is explained in terms of measurable growth, which results in an improved standard of living. It is usually a gradual and advanced improvement through progressive changes in the sociopolitical life of a nation. Hence, national development refers to the growth of a nation in terms of internal cohesion, integration, unity, economic well-being, mass participation in government, and educational growth.

Pritchett (2021) defines national development as a four-fold transformation of countries towards: (i) a more productive economy, (ii) a more responsive state, (iii) more capable administration, and (iv) a shared identity and equal treatment of citizens. Thus, this four-fold transformation of national development would lead to higher levels of human well-being. Also, it is empirically necessary for high wellbeing (no country with low levels of national development has high human wellbeing) and also empirically sufficient (no country with high national development has low levels of human wellbeing). While there are three measures of national development: productive economy, capable administration, and responsive state. In addition, how national development delivers on wellbeing varies, in three ways. This implies that one, economic growth is much more important for achieving wellbeing at low versus high levels of income. Also, two, economic growth matters more for "basic needs" than for other dimensions of wellbeing (like social inclusiveness or environmental quality). Equally important, three, state capability matters more for wellbeing outcomes that depend on public production than on private goods (and for some wellbeing indicators, like physical safety, for which growth doesn't matter at all).

Safety culture (2024), Operations management is in charge of everything that goes into making goods and delivering services. It manages resources like materials, machines, technology, and people, and produces the goods and services that people want in the market. It further defines operation management as, how resources are turned into goods and services in the most efficient way possible to fulfill the demand of consumers or clients. Though, it explains that the two foundations of operations management are supply chain management and logistics.

In addition, supply chain meets the customer's request and foster satisfaction. And Logistics long-term goal is to get the right thing to the right location at the right time. Where they are utilized to manage, coordinate and monitor the resources needed to move the products in a timely and cost-effective manner. Hence to this regard, activities such as Transportation, shipping and receiving, importing and exporting operations, warehousing, managing of inventory, purchasing, and customer service are all part of logistics. Miller (2024), Operations management is your solution. Thus, it entails planning, organizing, directing, and overseeing

business activities to deliver the best possible products and services to customers. Essentially, operations management is what gets a product from an idea to your doorstep. Thus, operations management is a strong operations foundation, that ensures:

i. On-time deliveries: Operations management streamlines production schedules to meet customer deadlines.
ii. Optimized resources: Efficient supply chain and inventory management means you always have what you need without unnecessary waste.
iii. Consistent quality: Good and reliable quality control processes guarantee your products or services always meet customer expectations.
iv. Seamless workflow: Operations management maximizes efficiency across departments.
v. Increased productivity: Get more done with the same resources through process improvements.

Gordon (2024), Explains that operations management concerns the management of business process for the efficient utilization of materials, equipment, technology, human resources, etc., within an organization While it emphasizes on efficient conversion of materials and labor into products and services so as to increase the firm's profits. Thus, the teams strive to strike a balance between the costs and revenues of the firm for earning the maximum net operating profit. In addition, it explains that the general objectives of operations management are:

i. Quality,
ii. Speed,
iii. Dependability,
iv. Flexibility, and
v. Cost.

SynergenOG (2024), Operations management is the administration of business practices to create the highest level of efficiency possible within an organization. It is concerned with converting materials and labor into goods and services as efficiently as possible to maximize the profit of an organization. Safety is not a part of operations management but is a central core that governs the entire operation. Prokop (2022), Operations management involves the application of purposefully designed processes or systems in order to better understand or improve specific business activities. The activity that tends to be the most prominent in operations management is the production process (i.e., turning inputs into outputs). This is because successful production serving today's marketplace takes place when there is a production plan or system in place.

In addition, Conger (2024) states that there are many problems and challenges in operations management. While the essential ones are:

1. Labor shortages
2. Logistics delays
3. Long lead times
4. Equipment downtime

5. Inventory management
6. Space shortages
7. Safety management
8. Ineffective communication
9. Quality control

Conger further went on to explain the essential elements of operations management as follows:

i. Planning. Operations management requires constant forecasting, planning, and adjustment to optimize processes based on conditions.
ii. Process. The production of goods requires clear, strong, repeatable processes.
iii. Efficiency. To create optimal efficiency, managers must troubleshoot bottlenecks, inadequate resources, and downtimes.
iv. Cost control. Production is a major part of a company's cost structure. It requires wise management.
v. Quality. Quality control is necessary to maintain product quality, customer satisfaction, and the company's reputation.
vi. Continuous improvement. To remain competitive, businesses need continuous processes with innovation.
vii. Technology. A solid technological foundation will improve processes, enable innovation, and support growth.

World Health Organization (2024), Surveillance is defined under the IHR as the systematic ongoing collection, collation, and analysis of data for public health purposes and the timely dissemination of public health information for action. Annex 1 of the IHR outlines core capacities required for surveillance at local/primary, subnational, and national public health response levels, including detection, reporting, notification, verification, and collaboration activities. While collaborative surveillance is defined as "the systematic strengthening of capacity and collaboration among diverse stakeholders, both within and beyond the health sector, with the ultimate goal of enhancing public health intelligence and improving evidence for decision-making." This concept promotes the strengthening of routine surveillance capacities (including public health and laboratory surveillance) and health systems monitoring, and collaboration between and beyond these systems to collectively support diverse surveillance objectives.

York (2015) states that natural surveillance includes the placement of windows and open areas with clear lines of sight. Grounds and parking areas are prime locations to provide clear lines of sight to prevent potential assaults by reducing hiding places or shielding illegal or unwanted behaviors. Perry (2013) notes that the increased presence of human observers, which territoriality brings, can lead to higher levels of natural surveillance in all areas of residential space. However, the simple presence of increased numbers of potential observers is not enough because natural surveillance, to be effective, must include an action component.

Riso (2024), The terms 'monitoring' and 'surveillance' are often conflated, understood to mean the same thing, and used interchangeably. Although they involve similar management practices, there are some differences. Employee monitoring has a more benign connotation, and it is generally confined to work-related activities. Going beyond that, surveillance practices can take the form of intrusive and pervasive monitoring, tracking a broad range of (work- and non-work-related) information (including personal characteristics) and invading the private sphere of individuals. 'Surveillance' also implies that workers may not be aware that they are being monitored. In the public discourse, surveillance is associated with more dystopian characteristics and evokes a contemporary digital panopticon, where individuals – within or outside the workplace – are on the receiving end of asymmetrical, invisible, and constant surveillance.

Croner-I (2024), Safety monitoring is a proactive strategy aimed at preventing accidents and occupational ill health by identifying deficiencies in safety standards, whether management procedures, work practices, systems of work, compliance with legal requirements, or emergency and personal protection arrangements. Safety monitoring can be performed in many ways, including inspections, audits, and surveys.

Health & Safety Authority (2023), Human Factors is a scientific discipline that takes account of human abilities and limitations – it is about understanding such capabilities and limitations and designing the system of work with that in mind. The Human Factors approach not only reduces operational risk from human error, but it also improves overall health and safety performance. It promotes workforce effectiveness through understanding inter-related workplace factors and helps to optimize decision-making and a positive health and safety culture, bringing performance and business benefits. Fennell (2017) states, "Human factors are the application of scientific knowledge about facilities and equipment, management systems, and people to improve their interaction in the workplace."

In addition, there are eight fundamental components of an effective human factors approach:

1. Workplace design deals with workplace setup and the design of the equipment with the consideration for how the people will interact with the equipment.
2. Equipment design assesses the effectiveness of the tools, control panels and displays.
3. Work environment explores how humans are impacted by noise, lighting, vibration, temperature and exposures.
4. Physical activities deal with the capabilities of the human body.
5. Job design helps us understand the impacts of work schedules, fatigue and workload, nformation transfer.
6. Personal factors deal with the individual capabilities of people as it relates to stress, fitness and other factors unique to the individual.
7. Human error helps us understand why we make mistakes and why we may interpret information incorrectly as we interact with the equipment and attempt to follow the procedures provided.

Australian Radiation Protection and Nuclear Safety Agency (2024), Human factors is the science of people at work. It is primarily concerned with understanding human capabilities and then applying this knowledge to the design of equipment, tools, systems, and processes of work. Human factors can use input from many disciplines (e.g., designers, engineers, psychologists, managers) and is considered a mix of engineering and psychology. The field of human factors can be seen to have four main goals: enhancing safety, reducing and managing errors, enhancing comfort, and increasing productivity. Human factors are important because it helps make work more efficient, effective, and safe. Organizations that address human factors will ensure the machines and equipment are easy and safe to use for their workers.

Material and Methods

This research took into consideration the incidents that affected lives and properties. Hence, to do the review the statistically software was used to analyze the data collected. For the duration under review, it was observed that some unsafe incidents took place without adequate mechanism to curtail and moderate some activities. Hence, this led to escalation of some of these fire incidents. Though, it is the frequency of the incident occurrence that is of great concern as this not only involves assets, but also had human factor and operational management lapses. Subsequently, these events were in some instances unavoidable and though not adequately managed such as the instances of bush fire, cigarette fire, saw-dust fire and dump site fire incidents. Some instances were avoidable such as the electrical surges. Which had the technical challenge as well as human factor. The incident of angry mob fire was identified using monitoring mechanism via crisis management mechanism. While the surveillance system is yet to identify some causes of some other incidents. Operational management and Interphase were used to identify the generator explosion incident. The Interphase management on Asset management system was technically used to identify the explosive accelerant incident. Though, the composition of the explosive involved is still under investigation.

Results and Discussion

Table 1: Showing market fire incidents among in Nigeria between November 2020 and August 2021

S/N	States Including FCT	Frequency of Fire Incident
1	Oyo	20
2	Lagos	15
3	FCT	3
4	Sokoto	2
5	Osun	2
6	Rivers	2
7	Bauchi	2
8	Anambra	2
9	Katsina	2
10	Jigawa	1
11	Yobe	1
12	Zamfara	1
13	Delta	1
14	Kwara	1
15	Edo	1
16	Benue	1
Total		**57**

Table 2: Showing the summary of frequency of market fire incidents in Nigeria between November 2020 and August 2021.

```
. sum frequencyoffireincident

    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
frequencyo~t |         17    6.705882    14.03017         1         57
```

Table 3: Showing the summary of frequency of market fire incidents with calculated data, details in Nigeria between November 2020 and August 2021.

```
. sum frequencyoffireincident,detail

                Frequency of Fire Incident
-------------------------------------------------------------
      Percentiles      Smallest
 1%           1              1
 5%           1              1
10%           1              1       Obs                  17
25%           1              1       Sum of Wgt.          17

50%           2                      Mean           6.705882
                     Largest         Std. Dev.      14.03017
75%           2              3
90%          20             15       Variance       196.8456
95%          57             20       Skewness       2.989625
99%          57             57       Kurtosis       11.04517
```

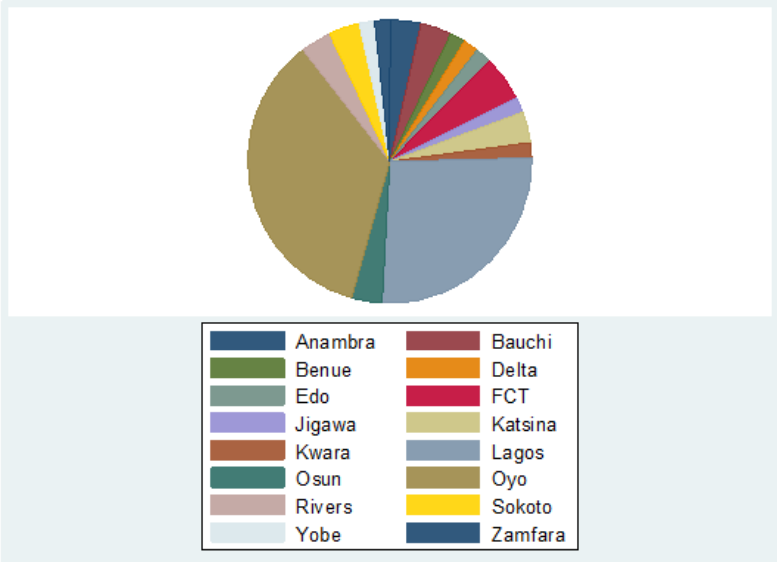

Figure 1: Showing pie chart of frequency of market fire incidents with calculated data, details in Nigeria between November 2020 and August 2021.

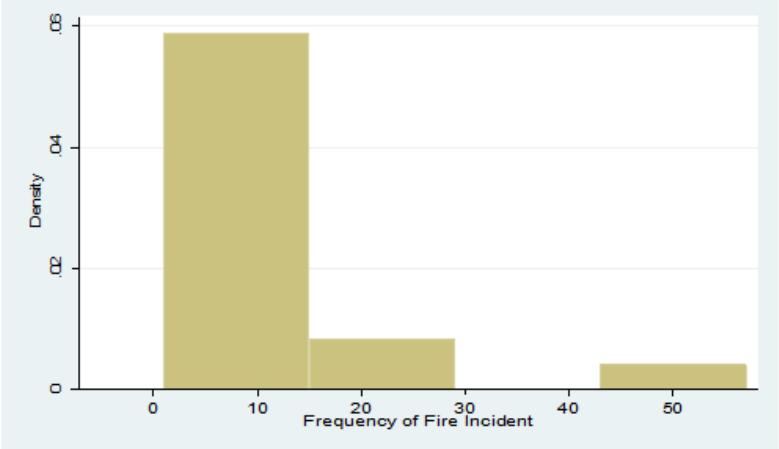

Figure 2: Showing histogram of frequency of market fire incidents with calculated data, details in Nigeria between November 2020 and August 2021.

Table 4: Showing the frequency of market fire incidents and cause of market fire incidents in Nigeria between November 2020 and August 2021.

S/N	Frequency of Fire Incidents	Cause of Fire Incidents
1	1	Angry Mob fire
2	1	Cigarette Fire
3	30	Unknown
4	15	Electrical Surge
5	1	Burnt Tyre
6	1	Bush fire
7	1	Saw Dust Burning
8	5	Dump site fire
9	1	Explosives/accelerants
10	1	Generator explosion

Table 5: Showing months' market fire incidents took place and the frequency of the incidents in Nigeria between November 2020 and August 2021.

S/N	Months	Frequency
1	November	3
2	December	6
3	January	9
4	February	11
5	March	13
6	April	6
7	May	4
8	June	3
9	July	1
10	August	1

Table 6: Showing States of market fire incidents, cause of incidents and frequency of market fire incidents in Nigeria between November 2020 and August 2021.

S/N	States including FCT	Cause of Incidents	Frequency of Incidents
1	Oyo	Angry Mob fire	1
2	Oyo	Cigarette Fire	1
3	Oyo	Electrical Surge	8
4	Oyo	Dump site fire	3
5	Oyo	Bush fire	1
6	Oyo	Unknown	4
7	Oyo	Burnt Tyre	1
8	Oyo	Saw Dust Burning	1
9	Lagos	Unknown	11
10	Lagos	Electrical Surge	3
11	Lagos	Explosives/accelerants	1
12	FCT	Unknown	1
13	FCT	Electrical Surge	1
14	FCT	Generator explosion	1
15	Sokoto	Unknown	2
16	Osun	Unknown	1
17	Osun	Electrical Surge	1
18	Rivers	Unknown	2
19	Bauchi	Unknown	1
20	Bauchi	Electrical Surge	1
21	Anambra	Unknown	2
22	Katsina	Unknown	2
23	Jigawa	Dumpsite fire	1
24	Yobe	Unknown	1
25	Zamfara	Electrical Surge	1
26	Delta	Unknown	1
27	Kwara	Dumpsite fire	1
28	Edo	Unknown	1
29	Benue	Unknown	1

From the tables, figures and data above, it shows that between 2020 and 2021 a total of fifty-seven (57) market fire incidents took place across Nigeria. While over thirty (30) market incidents causes are unknown. This was followed by fifteen (15) incidents of electrical surges. Though, unpreventable dump fire incidents witnessed five (5) incidents. The other incidents were because of explosive accelerants, generator explosion, burnt tyre, bush fire, saw dust burning, angry mob burning and cigarette fire respectively. On the monthly basis analysis, this shows that March 2021 had the most incidents with thirteen (13). This was followed by February 2021 with eleven (11) incidents. Though January 2021 had nine (9) incidents. While December 2020 and April 2021 had six (6) incidents. Although May 2021 had four (4) incidents. November 2020 and June 2021 had three (3) incidents. Finally, July and August 2021 had one (1) incident each.

In addition, on the state basis Oyo had the most with twenty (20) incidents. Lagos State had fifteen (15) incidents. FCT had three (3) incidents. While Sokoto, Osun, Rivers, Anambra, Bauchi, Katsina had two (2) incidents each. Jigawa, Yobe, Delta, Edo, Benue, Zamfara and Kwara had one (1) respectively. The summary of the incidents showed that there is a mean of 6.70 market fire incidents between November 2020 and August 2021. Which is approximately at least seven (7) market fire incident in ten (10) months.

Conclusion

As stated earlier, this work is an analytical work on some incidents across Nigeria between November 2020 and August 2021. Reviewing the incidents, from our literature taken into considerations the asset integrity management and human factor explanation. Some fundamental ideas and initiatives were overlooked in the area of operations management. Absence of safety management system by relevant stakeholders. Concerns and implementation on safety monitoring was weak and not adequate. Both the Health and Safety Authority as well as the Australian Radiation Protection and Nuclear Safety Agency view on human factors were not taken into consideration by stakeholders. There was presence of weak or no collaborative support system on surveillance and monitoring of incidents.

Though, there are some incidents like the bush fire, dump fire, burnt tyre and saw dust burning that could be controlled and contained by the appropriate authority and concerned persons. Although, relevant Government agencies or individuals can provide an alternative to such activities. Such as the establishment of a functional waste recycling and management plant within the city. In situations, where this is not possible other waste disposal alternatives can be utilized. The incident of electrical surge was clearly a technical issue. These incidents were more frequent than necessary and shows a lapse in operational activity of some stakeholders. Also, the incident of generator explosion should be reviewed to ascertain whether it was from the generator product manufacturer or the generator fuel or gasoline composition. To avoid a repeat of such occurrence in the future. The human factor should be taken serious in all events and activities. Hence, the incident of angry mob fire should be reviewed and assessed to determine whether it was jungle justice or transferred aggression. This is where the collaborative synergy between surveillance and monitoring stakeholders should interphase to have adequate capacity development. To avoid a repeat of such incident in the future.

In addition, both the relevant Federal agencies and State authorities should investigate further the explosive accelerants as this might be subsequently be replaced by incidents of arsonist. More importantly, relevant stakeholders and authorities should have the safety, surveillance and monitoring structure and system in place to avoid constant repeat of unknown market fire incidents in Nigeria. This will help to resolve some of the socio-economic challenges that our country - Nigeria is facing presently. Which will lead to economic growth and as a result national development and more importantly reduce crimes, terrorism and unemployment in our country – Nigeria.

Recommendations

Based on the events and activities that led to the build–up of this incident, the following are my recommendations. They are:

1. Conger 's emphasis on the essential problems and challenges in operations management as well as essential elements of operations management should be factored in the management of goods and service generally.
2. Coopting SynergenOG's views on operations management and its effect on the safety of the system.
3. Collaborative approach and capacity development should be encouraged in surveillance and monitoring activities at all levels for effective operations management and safety of lives and properties.
4. Encouragement of national growth and development through various initiatives and Programmes to avoid a repeat of unsafe incidents or acts.
5. Safety professionals need to step up and take the lead in human factors.
6. Compilation of a comprehensive asset integrity management system for life-cycle operation of all assets to maximize productivity and output and reduce unsafe incidents in all assets operations.
7. Psychological safety should fit into our human factors model for a conducive working environment or operational system.
8. Pritchett measures of national development should be reviewed by critical stakeholders and adequate mechanism put in place at various levels with a view for for its functionality.
9. Constant and continuous review of national development data, plan and activities by critical stakeholders and industry experts to foster national growth and development.
10. Miller's and Gordon's operations management approach should be reviewed and realigned in the area of surveillance, monitoring and asset management to enhance output and productivity.

Acknowledgement

This is a dedication to all my relatives, in-laws, clients, well-wishers who were victims of market fire incidents or similar incidents. Prevention and avoidance of a repeat of the same or similar experience. Praying for God to protect, heal and help all traders no matter what they are passing through. For the repose of the dead victims and all other traders who passed away. Remembering their families and businesses, praying for their economic recovery and human development. Most importantly, I am relying and trusting God Almighty through Our Lord

and Savior Jesus Christ for the complete physiotherapy recovery and healing of my sick widow mother – Mrs. R.N.M. Opata. Get well, My dearest Mom. While thanking all who are involved in her recovery and healing.

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