BTTM 706-18
Safety and Security Management

UNIT 1	Introduction to safety and security management, meaning, definition, Safety management fundamentals, Organizational safety culture, Safety management systems, Concept of occupational accident, Types of workplace accidents, Common causes, Occupational Health and Safety Management systems (OHSMS), Measuring OHSMS Performance.
UNIT 2	Understanding Tourist Security and Travel Safety, its importance and impact on the tourism industry. Consumer awareness of travel advisories and their influence on behavior. Common problems & Challenges with hotel & tourism destinations security. Security issues at airports, railway stations, single woman travelers in India, Tourist Police & Its Role, and Role of Ministry of Govt. of India, UNWTO Guidelines/ Advises on Safety and Security, International Issues on Tourist Security, the role of insurance in the travel industry.
UNIT 3	Definition and Concept of Hazard **Risk**, Risk and Vulnerability Analysis, Risk: Concept and analysis, Risk Reduction, Vulnerability: Its concept and analysis, Strategic Development for Vulnerability Reduction Types and classification of Disasters **Natural** Earthquakes, Floods Cyclones and Cloud burst. Avalanches, Forest Fire and Tsunami. **Human induced** Nuclear, Chemical and Industrial Disasters Global warming;

	Biological Disasters; Epidemics
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Unit 1

Safety and Security Management

Security and safety challenges rank among the most pressing issues of modern times. Challenges such as, cyber-crime, terrorism, and environmental disasters impact the lives of millions across the globe. These issues also rank high on the agenda of politicians, international organizations and businesses. They also feature prominently in the public conscience and in governmental policies. In the current, interconnected world, security challenges are becoming increasingly complex. Facilitated by developments as globalization and the spread of networked and hyper-connected technologies, new safety and security challenges arise and impact local, national, regional and international levels, which dramatically increases their complexity and scale

A concept of safety is most often used to describe situations when acquired values are harmed by accidental flaws and mistakes. These can be technical errors, organizational failures, or forces of

nature. A simple example of a safety issue is enjoying a walk on a summer night and getting hit by lightening. This example demonstrates that safety is about protection from accidental harm. No human is causing you trouble, but the accident seriously harms your health and may even take your life.

The main difference between safety and security lies in the source of the threat. In case of security, acquired values are harmed by intentional actions undertaken by humans. It just comes down to a person or group of people taking deliberate actions thereby causing a security threat. Security is just about protection from intentional harm. An example for security issue is becoming a victim of an armed robbery. In this case your possessions, or maybe even your physical, or your mental health, are harmed, by intentional actions of a human being.

Safety is the condition of being protected from harm or other non-desirable outcomes, caused by non-intentional failure. Security is the condition of being protected from harm or other non-desirable outcomes caused by intentional human actions or human behavior.

In essence, both concepts are about potential or actual harm to acquired values. These values can be just about anything such as health, possessions, or cultural traditions. The main difference between safety and security lies in the nature of the threat, intentional versus non-intentional. It is important to stress that most contemporary security challenges entail both security and safety aspects. Take for example In June 2013, a mid-day cloudburst centered on the North Indian state of Uttrakhand caused devastating floods and landslides, becoming the country's worst natural disaster since the 2004 tsunami. The safety aspect might be obvious here. Non-intentional natural phenomena caused harm to the state and endangered public health. However, we cannot overlook the human factor. The security aspect here are the people. Such as technicians and representatives of government, undertaking crucial actions that partly contributed to the course of events. This example demonstrates that we need to focus on both safety and security aspects in order to fully grasp the disaster.

Meaning and Importance:

Safety refers to the accidents, stated differently. It also refers to the protection of workers from the dan-ger of accidents. Employee safety and security refers to the protection of workers from the dangers of industrial accidents.

An accident is an unplanned and uncontrolled event, which can be major or minor, partial or total. In any case a worker gets disabled, it can affect the productivity. So, an accident-free plant is expected from the employers.

According to Merriam-Webster, the primary definition of safety is "the condition of being free from harm or risk," which is essentially the same as the primary definition of security, which is "the quality or state of being free from danger." However, there is another definition for security; that is, "measures taken to guard against espionage or sabotage, crime, attack or escape," and this is generally the definition we are using when we refer to industrial security.

WORKPLACE SAFETY

Workplace safety is a process that seeks to eliminate or reduce risks of injury or illness to employees. The chief aim of workplace safety is to protect an organization's most valuable asset—its people. Workplace safety is achieved through a variety of methods, including policies, procedures and specific hazard control techniques.

Policies and procedures are devised and integrated into the organization's overall management and administrative processes. They usually involve specific job task procedures established for working with or around equipment, hazardous environments or other forms of high-hazard conditions. Safety procedures and policies include accountability requirements to ensure that prescribed practices are followed.

Safety professionals apply a well-recognized hierarchy of measures to eliminate or control specific workplace hazards. The measures are applied as part of an orderly decision-making process, as follows:

Substitution. Can the existing process, material or equipment be replaced with a less hazardous process, material or equipment?

Isolation. Can barriers or limits be placed between people and the hazard? This could be physical barriers, time separation or distance.

Ventilation. Can the potential hazardous airborne substances be ventilated through dilution or capture?

Administrative controls. Can the hazards be effectively mitigated through specialized operating practices? Examples include restricting access to certain high-hazard areas to authorized personnel only, adjusting work schedules or adopting preventive maintenance programs to address potential equipment breakdown.

Personal protective equipment. If the preceding methods are not sufficient or feasible, can personal protective equipment be provided (e.g., safety glasses, gloves, hard hats, hearing protection, safety footwear, respirators)?

WORKPLACE SECURITY

The chief aim of workplace security is to protect employees from internal and external security risks. Workplace security has gained much attention in the last several years due to an increase in workplace violence, the necessity of background investigations of prospective and current employees, Internet- and technology-based security needs, threats of terrorism, and increased legal liability to organizations for not taking reasonable measures to safeguard the workplace due to security threats.

Workplace security risks vary depending on an organization's business, its location and its hours of operation. A fundamental element of any workplace security initiative is a security risk assessment. Risks need to be properly identified to establish appropriate methods, either procedural or physical barriers or systems.

The scope of workplace security has continued to expand. Depending on the nature of the business and related security risks, organizations may need to address the following:

- Establishing a formal security function.
- Establishing computer, e-mail, and Internet policies and procedures.
- Including non-compete agreements and other types of clauses in employment contracts for the protection of proprietary information and intellectual property.
- Developing crisis management and contingency plans.
- Establishing theft and fraud prevention procedures.
- Developing workplace violence prevention procedures.
- Installing premises security systems.
- Developing restricted-access policies and key-control procedures.

Causes of Accidents:

There are three factors that contribute to accidents. These causes can be

1. Work-related causes,

2. Unsafe acts by the employees,

3. Chance occurrences

The work-related factors can be defective equipment, inadequate safety devices, poor housekeeping and absence of maintenance of machines, which can result in accidents.

Unsafe acts can be due to carelessness of the workers and use of unsafe procedures.

The other causes can be due to bad working conditions, very long hours of work, carelessness in handling materials and lack of training. All these accidents can increase the cost of production directly or indirectly. Therefore, the management should take enough care to reduce the accidents to the minimum.

Techniques for Improving Safety and Security of Employees:

1. Safety Programmes:

This deals with prevention of accidents, minimization of losses, and damages to the property and life of the employees. There are five principles for a safety pro-gramme.

a. Industrial accidents can take place due various reasons such as lack of good leadership, lack of motivation from the management and insufficient safety mechanisms. The root cause has to be traced out.

b. Identify the potential hazards and provide effective safety facilities.

c. The top management should have safety policies, which should be continuously monitored.

d. The accountability of the personnel should be determined for the safety performances.

e. Thorough training and education regarding the safety measures and devices.

2. Safety organization:

An organization can set up a safety committee and a safety director for deciding various safety programmes to be conducted in an organization. A safety programme must be developed to educate and train the employees to avoid mechanical as well as personal hazards.

3. Safety engineering:

The important function of safety engineering is to eliminate all the possible risks due to processes, handling of machines or equipment's. Safety equipment such as glasses, gas masks, and gloves should be provided free for protection.

4. Safety education and training:

Safety education for all levels of management and for every employee is a must. The main objective of safety education is two-fold: first, to develop safety consciousness among the personnel and second, to ensure safe performance by developing the skills of the employees. Training gives immediate knowledge that can help the employees under-stand the hidden hazards, the knowledge to prevent accidents, safe handling of materials, and good housekeeping.

5. Safety contests:

Some organizations encourage safety competitions among their departments to emphasize the importance of safety.

6. Disciplinary action:

An organization can take action against any employee in case they are found guilty of any violations. The safety programme and safety policy is based on the well-being of employees, and it stresses the fact that human resources are the most valuable assets, and their safety is the greatest responsibility.

Need for Safety:

There are certain benefits enjoyed by the organization as well as the employees when the plants become accident free. International Labour Organization (ILO) observes 28 April as the World Safety and Health Day just to give significance for safety at work.

Benefits to the Organization:

1. There is substantial savings in costs.

2. This can reduce the wastages to the minimum.

3. Safety can also ensure optimum utilization of resources.

4. All the above reasons can contribute to improvements in productivity.

5. Financial losses that accompany accidents can be avoided.

6. The employees are less worried about their safety, which can improve their efficiency.

7. The penalty for non-compliance of safety measures can be avoided.

Benefits to the Employee:

1. Increased earnings of a company improve the earnings of a worker.

2. This can boost up the morale of the employees.

3. The workers are less worried about their safety.

4. They are motivated to work better.

5. This can again improve their efficiency.

6. Employees in a safe plant can devote more time for improving the quality and quantity of their output.

7. They can spend less time in worrying about their well-being and safety.

FUNDAMENTALS OF SAFETY MANAGEMENT SYSTEM

Addressing-Hazards-in-the-Workplace

WHAT IS A SAFETY MANAGEMENT SYSTEM?

OSHA defines a safety management system as: "A decisive factor in reducing the extent and severity of work-related injuries and illnesses." A safety management system is essentially a planned process with a set of regulations and policies, which help mediate and successfully carry out certain activities within a workplace in a safe, productive manner. It provides a systemic approach to organizing and categorizing institutional structures to provide accountability for policy and procedure adherence.

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THE BASICS OF A -SAFETY MANAGEMENT SYSTEM (SMS)

The implementation of a safety management system enables organizations to control and effectively regulate the possibility of a safety risk within a working environment. It not only allows organizations to identify and predict a foreseeable injury, but also take the necessary precautions needed to avoid the risk of harm. Just like any other management protocol, a safety management system includes consistent and strategic planning, structural organization, guided directions, and open communication. Some of the basics of an SMS include, but are not limited to the following:

- Establishing the concept of safety
- Understanding the evolution of safety risks and required protocols
- Knowing and understanding the probable injury causative system failures
- Regulating the baseline employee performance to follow procedures to prevent risk of harm when deviating from the original requirements

- Assessment and understanding of the human performance and its effect on safety
- Managing system oversights to avoid errors or violations that occur because of noncompliance with the SMS regulations
- Laying the framework for establishing and promoting a safety culture within the organization to have all the members of an institution prioritize safety policies without compromising productivity
- Devising ways to balance both safety and workplace productivity for optimal organizational results
- Balancing the changes in regulatory policies and procedures over time and with the change in existing practicing system and equipment
- Managing hazard potential with respect to the changes in procedure and safety management practices
- Implementing effective and timely reporting processes to document accidents, incidents, or safety hazards
- Setting in motion thorough investigation protocols for accident management
- Having in place data collection procedures for the maintenance of a job-specific safety database for the effective and reliable analysis of the hazard or accident incidences
- Having data protection protocols to prevent the potential misuse of sensitive information
- Implementing analysis practices for quality assurance purposes as well as for the effective compliance with safety management systems
- Having in place strict performance indicators and monitoring to evaluate the probability of safety risks as well as the effective safety risk management

THE IMPORTANCE OF A SAFETY MANAGEMENT SYSTEM

Safety management systems are in place to provide strict criteria that aid organizations in achieving their objectives in a regulated, performance-based manner. These systems allow the effective implementation and management of safety protocols within an institution as well as within an industry, overall. Furthermore, safety management system compliance helps businesses fulfill their legal responsibilities as well as benefit financially. Some of the various ways in which SMS compliance benefits organizations are listed below:

- Helps provide safe and stable consumer support
- Helps reduce insurance premiums, due to the implementation of safety protocols
- Reduces the possibility of accidents/injuries
- Minimizes loss of life in hazardous working conditions
- Improves employee satisfaction and morale
- Enhances productivity with improved health of the employees
- Minimizes absenteeism
- Leads to a balanced interaction with the regulatory authorities

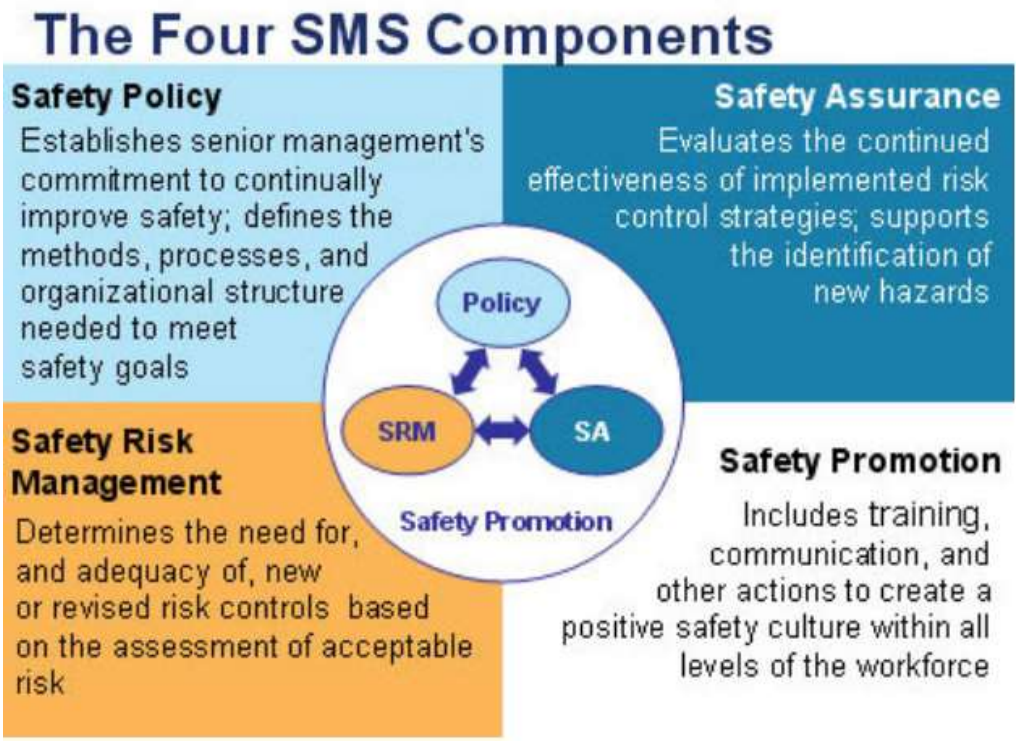
For employers and employees across all sectors and industries posing potential risks to human life in any way, it is highly recommended that they be sufficiently trained in safety management systems and protocols via a certified training program. A safety management system course, such as the OSHA standardized Process Safety Management course can help employees and employers

understand and keep up with the evolving occupational health and safety federal policies. It also allows them to familiarize themselves with the changes in the safety management systems.

The Four SMS Functional Components

The essential idea of any SMS — be it a product/service provider's SMS or the SMS of the regulator responsible for safety oversight — is to provide for a systematic approach to achieving acceptable levels of safety risk. SMS is comprised of four functional components, including an intangible, but always critical, aspect called safety culture.

- Safety Policy
- Safety Risk Management
- Safety Assurance
- Safety Promotion (Safety Culture)



The four components of a SMS are:

1. **Safety Policy —** Establishes senior management's commitment to continually improve safety; defines the methods, processes, and organizational structure needed to meet safety goals

- Establishes management commitment to safety performance through SMS
- Establishes clear safety objectives and commitment to manage to those objectives
- Defines methods, processes, and organizational structure needed to meet safety goals
- Establishes transparency in management of safety
  - Fully documented policy and processes
  - Employee reporting and resolution system
  - Accountability of management and employees
- Builds upon the processes and procedures that already exist
- Facilitates cross-organizational communication and cooperation

2. **Safety Risk Management (SRM)** — Determines the need for, and adequacy of, new or revised risk controls based on the assessment of acceptable risk

- A formal process within the SMS composed of:
  - Describing the system
  - Identifying the hazards
  - Assessing the risk
  - Analyzing the risk
  - Controlling the risk
- The SRM process may be embedded in the processes used to provide the product/service

3. **Safety Assurance (SA)** — Evaluates the continued effectiveness of implemented risk control strategies; supports the identification of new hazards

- SMS process management functions that systematically provide confidence that organizational outputs meet or exceed safety requirements
- AVS SMS has a dual safety assurance focus:
  - AVS organizations
  - Product/service providers
- Ensures compliance with SMS requirements and FAA orders, standards, policies, and directives
  - Information Acquisition
  - Audits and evaluations
  - Employee reporting
  - Data Analysis
  - System Assessment
- Provides insight and analysis regarding methods/opportunities for improving safety and minimizing risk
- Existing assurance functions will continue to evaluate and improve service

4. **Safety Promotion —** Includes training, communication, and other actions to create a positive safety culture within all levels of the workforce

- Safety promotion activities within the SMS framework include:
  - Providing SMS training
  - Advocating/strengthening a positive safety culture
  - System and safety communication and awareness
  - Matching competency requirements to system requirements
  - Disseminating safety lessons learned

- Everyone has a role in promoting safety

The Occupational Safety and Health Administration, frequently called OSHA for short, has a succinct definition for a workplace accident. It's an "unplanned event that results in personal injury or property damage." OSHA is a government body tasked with helping keep workplaces safe for its employees.

Herbert William Henrich, a founding father of sorts for the workplace safety movement, called workplace accidents "unplanned and uncontrolled events" resulting in personal injury

Whatever variation of the definition you prefer, workplace accidents can be painful and costly for both employers and employees.

Types of Workplace Accidents

Here are a few types of accidents most commonly reported in the workplace.

Overexertion: We do it all the time: pull a bookcase, carry heavy equipment or lift awkward boxes. Injuries from overexertion, such as sprains and strains, are the leading workplace accident.

Falling: Just like in our opening example, falling presents a significant risk in many work environments. It could be as simple as falling down stairs or tumbling off a roof.

Slips and trips: Have you ever seen the image of someone slipping on a banana peel? It's the same idea (probably minus the banana). Slips and trips can be the culprit behind things like muscle strains and other injuries.

Falling objects: Whether it's a heavy box of files or a piece of machinery at a construction site, falling objects present a particular risk of head injuries to workers.

Repetitive motion: It's a little less obvious, but repetitive motion injuries have an impact on many types of workers, from frequent computer users who struggle with carpal tunnel syndrome to auto mechanics who develop chronic back pain.

Workplace Accident Statistics

The most recent data on workplace accidents show that there were 882,730 occupational injuries and illnesses in 2017.

The Bureau of Labor Statistics (BLS) reported that of those cases:

- 11% involved overexertion in lifting or lowering.

- 64% of bone fractures were from accidents in the service industries.
- 62% of slips, trips, and falls were on the same level.
- 20% of slips, trips, and falls were from a worker falling between two or more levels.
- 15% of all nonfatal workplace injuries were from workers being struck by equipment or objects while on the job.
- 35% of cases across all industries resulted from sprains, strains, and tears.

The BLS also reported that, across all industries, more than 25% of all injuries were caused by slips, trips, and falls.

From 2014 to 2017, 8,004 such incidents occurred in Indian workplaces killing 6,368 employees. Most such incidents took place in Delhi, Maharashtra and Rajasthan.

10 of the most common workplace accidents and injuries

There are hundreds of thousands of accidents – many of them serious – in workplaces every year. That's why it's so important for every small business owner to take the proper precautions.

Of course, even the best prepared among us can still fall victim to accidents at work. But to be forewarned is to be forearmed, so here are ten of the most common accidents and injuries in the workplace;

1. Slips, trips and falls

Whatever your particular work setting is – whether you work in a shop, a factory or an office – you're likely to encounter slippery surfaces at some point, so it's not a totally remote possibility that you might come a cropper on one.

Another big risk for many is falling while working at height; falls from ladders are most common, but falls from scaffolding and other platforms can also be dangerous.

2. Muscle strains

Strained muscles are another commonplace work-related injury, as anyone who regularly lifts heavy items at work will probably know already. Back and neck strains, in particular, are all too frequently sustained while working.

These injuries can be avoided easily – some basic training on proper lifting techniques can make a big difference.

3. Being hit by falling objects

Plenty of workers find themselves on the receiving end of falling objects – and what's more, this isn't just a problem in warehouse-type environments. Objects which fall from shelves or out of cupboards can cause some nasty injuries, particularly if the individual who ends up feeling the full force doesn't see it coming.

Providing adequate storage cages and reminding employees of how to store items safely can go a long way to reducing this risk.

4. Repetitive strain injury

RSI is another problem that's become increasingly commonplace at work over the years, though even now some employers don't seem to take it entirely seriously.

It's not just a problem for those of us who regularly use keyboards in our work, either – in fact, it can result from any repetitive motion of the joints. The cumulative impact of RSI can be severe in some cases, so it makes sense to take precautions.

Employers can help prevent RSI by encouraging and reminding workers to take appropriate breaks. Likewise, ergonomic equipment, like hand trucks can help to alleviate the strain.

5. Crashes and collisions

Accidents resulting in crash or impact injuries are also quite frequent at work. Whether they involve cars, Lorries or even smaller vehicles such as forklift trucks, they can have seriously nasty consequences.

It's therefore up to employers to ensure that seatbelts and other safety precautions are both in place and in use where appropriate.

6. Cuts and lacerations

All sorts of office implements can end up leaving their user nursing a painful cut. From power saws to paper trimmers, it's easy to do yourself a mischief at work. The most common causes of these lacerations include poor training, inadequate safety procedures and failing to wear the proper protection.

Bosses can help prevent such accidents by providing adequate safety equipment and putting the right procedures (including training) in place.

7. Inhaling toxic fumes

While most of us don't work with hazardous chemicals, those of us who do may be at risk of skin or eye reactions as well as potentially more serious injuries when exposed to them without protection.

Protective equipment such as safety goggles is indispensable in these situations, so employers must be sure to provide workers with the gear they need to avoid dangerous exposure.

8. Exposure to loud noise

You might think that industrial deafness is a thing of the past and went out with all those old heavy industries, but that's not the case – not least because many industrial workers continue to be exposed to loud noises while at work.

Industrial deafness can also result in major compensation payouts further along the line, so it's very much in employers' interest to nip this particular problem in the bud. Safety measures such as ear protection can do much to prevent it.

9. Walking into objects

It's probably safe to say we've all done this at some point. Maybe you're chatting absent-mindedly or maybe you're feeling a little under the weather, when you suddenly find yourself on the sharp end of a door, table, wall or cabinet. Needless to say, these injuries can sting a bit.

Luckily, many such accidents can be avoided by reminding employees to be vigilant and putting unnecessary hazards out of the way where people won't walk into them.

10. Fights at work

These aren't quite as rare as we might like to think. Simmering workplace tensions can bubble under for months or even years before spilling over into physical confrontation, or alternatively one workmate can take another's opinion on last weekend's football the wrong way.

Fights in the workplace can, unsurprisingly, result in nasty injuries. Effective procedures for dealing with employee grievances can help reduce the risk of them coming to blows, though.

Round-up

Although there's no shortage of ways people can injure themselves at work, as we've already noted there are various things employers can do to prevent their employees from coming to any avoidable harm.

Good training, clear signage and access to the necessary safety equipment can all be a big help. Regular risk assessments are also a very good idea. You can't always legislate for sheer absent-mindedness, but you can at least avoid a lot of unnecessary mishaps.

The Best Ways to Prevent Workplace Accidents

The best way to avoid workplace accidents is through a strategic safety plan. With proactive measures in place, you and your employees can create a culture of safety and a targeted accident prevention program.

Consider the following tips to bolster your safety efforts:

1. Promote safety awareness and education with regular safety briefings and employee safety training.
2. Install proper lighting to create a well-lit and visible jobsite that makes it easier for your staff to see potential risks and avoid them.
3. Communicate safety hazards with adequate signage that clearly identifies hazardous areas and potential risks like obstacles, spills, toxic materials, or other hazards.
4. Contain spills quickly when they happen, and remember to always have cleanup equipment readily accessible in your workplace.

5. Routinely check for safety hazards, like spills or obstacles.
6. Install proper ventilation to prevent toxic chemicals or other foreign particles from being inhaled by your employees.
7. Enforce proper attire that's necessary for accident prevention, like hard hats or slip-resistant shoes.

What is an OHSMS?

A management system is a proactive process in which an organized set of components enable an organization to accomplish a set of goals. An OHSMS is a framework that allows an organization to consistently identify and control its health and safety risks, reduce the potential for incidents, help achieve compliance with health and safety legislation and continually improve its performance.

What are the advantages?

Advantages include a safer workplace, improved employee morale, reduced costs, stakeholder confidence, and more.

Most successful OHSMSs are based on a common set of key elements. These include: management leadership, employee participation, hazard identification, hazard prevention and control, education and training, and program evaluation and improvement.

OHSMS Origins and Current Guidelines

The idea of a health and safety management system or program is not a new concept. OSHA published safety and health program management guidelines in 1989 .The Occupational Health and Safety Assessment Series (OHSAS) 18001 is a well-known British standard that was developed in 1999 by more than a dozen international bureaus and certification bodies. Since 1999, the International Labor Office (ILO), numerous countries, and other organizations have developed OHSMS guidelines.

The American National Standards Institute (ANSI) developed a U.S. consensus standard on OHSMS with the American Industrial Hygiene Association (AIHA) in 2005 entitled ANSI/AIHA

Z10. Canada developed guidelines in 2006 entitled CSA Z1000. Australia and New Zealand have several OHSMS standards and guidelines as well.

ISO 45001, Occupational health and safety management systems. However, a key difference between the OHSAS 18001 and the ISO 45001 is the stronger focus on the "context" of an organization, as well as a stronger role for top management and leadership. The new context forces organizations to focus not only on their internal employees, but also their contractors and suppliers and how their work might affect the surrounding community. ISO 45001 requires health and safety aspects to be part of an overall management system and no longer just an added extra. This standard will be easily integrated with the current well known certifications (ISO 9001 for quality and ISO 14001 for environmental management).

An Occupational Health and Safety Management System (OHSMS) is a fundamental part of an organisation's risk management strategy. Implementing an OHSMS enables an organisation to:

- Protect its workforce and others under its control
- Comply with legal requirements
- Facilitate continual improvement

ISO 45001 is the new international standard for an OHSMS. While it is similar to OHSAS 18001, the new ISO 45001 standard adopts the Annex SL top-level framework of all new and revised ISO management system standards.

ISO 45001 can be aligned with other management systems standards, such as ISO 9001:2015 and ISO 14001:2015. ISO 45001 was published in March 2018.

Below are key requirements and differences from OHSAS 18001.

ISO 45001 STANDARD – KEY AREAS AND ORGANISATION CONTEXT

ISO 45001 places a strong focus on an organisation's context. It requires the organisation to consider what stakeholders expect from it in terms of occupational health and safety management. The organisation must determine which interested parties are relevant to its OHSMS and also determine the relevant requirements of those interested parties.

The intent of ISO 45001 is to provide an organisation with a high-level understanding of the important issues that can affect it either positively or negatively and how it manages its occupational health and safety responsibilities towards its workers.

Issues of interest are those that affect the organisation's ability to achieve its intended outcomes. These include the objectives it has set for its OHSMS, such as meeting its OHS policy commitments.

OHS LEADERSHIP

Top management must now demonstrate its involvement and engagement with the OHSMS through direct participation, taking OHS performance into account in strategic planning.

Top management must also contribute to the effectiveness of the OHSMS by playing an active role in directing, supporting and communicating with workers, and promoting and leading organisational OHSMS culture.

This new standard clearly defines the requirements for top management responsibility and accountability regarding occupational health and safety management. This is to ensure that ultimate responsibility cannot be delegated to health and safety or other managers within an organisation.

PARTICIPATION AND CONSULTATION

The standard requires the organisation's top management to encourage consultation with, and participation from workers and their representatives, as these are key factors in OHS Management.

Consultation implies two-way communication – dialogue and exchanges – and involves the timely provision of the information that workers and their representatives require before the organisation can make a decision.

The OHS management system depends on worker participation, which enables workers to contribute to decision making regarding OHS performance and provide feedback on proposed changes.

The organisation must encourage workers at all levels to report hazardous situations, so that preventive measures can be put in place and corrective action taken. Workers must also be able to report and suggest areas of improvement without fearing dismissal, disciplinary action or similar reprisals.

RISK-BASED APPROACH TO THE OHSMS

Closely aligned with the focus on organisational context is the requirement to adopt a risk-based approach when developing and implementing an OHSMS. An organisation must identify the risks and opportunities that it must address to ensure that the OHSMS can achieve its intended outcomes.

These risks and opportunities include those relevant to, or determined by its organisational context. The organisation must plan actions that address these risks and opportunities, implement them into its OHSMS processes and evaluate the effectiveness of these actions.

OUTSOURCING

The standard requires an organisation to ensure that outsourced processes affecting its OHSMS are defined and controlled. When outsourced products and/or services supplied are under the control of the organisation, supplier and contractor risk must be managed effectively.

DOCUMENTED INFORMATION

The term "documented information" is used instead of "documents and records", which was present in OHSAS 18001. Evidence from processed information not held in a formal document system, such as electronic information held on smart phones and tablets, is now accepted.

MIGRATING FROM OHSAS 18001 TO ISO 45001

If your organisation currently holds accredited OHSAS 18001 certification, you have three years from the formal publication of the new standard (published in March 2018) in which to migrate to the new ISO 45001 standard.

Unit 2

UNDERSTANDING TOURIST SECURITY, ITS IMPORTANCE AND IMPACT ON TOURISM INDUSTRY

The word safety and security are used together but it has literary differences too. Safety has been defined as a condition in which a person is being protected from harm caused by unintentional failure while security is defined as a condition in which a person is being protected from harms caused due to intentional human behavior or actions. Safety and security is the major concern among all the living creature of this universe. It is also described by Maslow through his Need and Hierarchy Theory. The safety and security does not confined to life only but it also emphasizes on job, health and environment.

As we know tourism is a recreational activity in which a tourist leaves his/her home to a distant place because of leisure and pleasure or fulfill different motives. For him safety and security is a major challenge. At this (new and unfamiliar) place he/she has to stay somewhere so that he/she can feel safe. Thus, some short of means of shelter is required to keep himself/herself safe from unforeseen circumstances. One of the prime component of tourism industry is tourists who contribute into the local economy by their spending. They also bring revenue to the governments by invisible trade. Once the image of a destination get deteriorated due to misbehave, cheating and theft or any hostile behavior shown by the locals may have serious consequences over the tourist inflow and probably it may hamper economics of tourism over the place. That‟s why many countries have concentrated on tourist safety and security. In India, also, the government has talked about seven “S” out which “SURAKSHA” is one of the essential components. The Ministry of Tourism, Government of India is destined to offer safety and security to solo travelers, female travelers and every national and international travelers.

Importance of Tourist Security: The destination is being represented by the tourist. The overall satisfaction is being felt by the traveler generates more tourists to the destination, the attributes of the destination brings more satisfied tourists and hence, the destination get converted into a brand.

More tourist facilities are increased and supply pattern is being changed. The dependency of the locals on tourism is also increased gradually. More tourist inflow will generate more employment opportunity and the flow of income is maintained. But it all are based on tourist inflow and better services. The safety and security is one of the components that bring satisfaction to the travelers. So a dissatisfied traveler will stop many to visit a place which is not compatible (tourist friendly) to travelers. The destination with negative image (often confronted with agitation, crime, curfew, community clashes etc.) will hardly attract tourist from remote places. So, a tourist centric destination is important not for individual tourists but for every stakeholders who is reaping benefit from it i.e. government, locals etc.

Impact on Tourism Industry: For the prosperity of any nation it is utmost required that government should create a favorable environment for tourists to visit. If the governments are considering tourism as a cash cow, they should provide amenities at least of that extent. The slackness in maintaining law and order at destinations may affect tourist inflow. The reputation of the destination will also be affected which may prevent the tourists to visit and revisit. Tourism is a business and in any business investment is required, similarly, tourism development attracts a lot of investments from various stakeholders and imagine if the tourists are not willing to visit what will be the consequences? As we know all touristic activities are meant for solace and peace of mind and any miss-happening will bring all his time and money spoilt. Therefore, the governments are putting a lot of efforts to branding a destination crime free and tourist friendly. In this regard a lot of capacity building programmes and awareness programmes have been launched to signify the importance of tourist safety and security in the prospects of economy.

CONSUMER AWARENESS OF TRAVEL ADVISORIES AND THEIR INFLUENCE ON BEHAVIOR

To define an advisory, it can be said that it is a piece of information, bulletin or an announcement that is used to advise and warn people regarding potential hazards. This advisory plays an important role in making aware the tourist regarding their holiday plan and destination, types of preparation required and in fact it is the standard operating procedure (SOP) which is badly required. It can be checked well in advance before finalizing a booking and also during leaving for destination because there is a huge time gap when some books a holiday package and actual journey starts.

These advisories are helpful to tourists in many folds but the question is whether tourists use certain sources to access these advisories, how much they rely on these sources and in the last do they really act as per the SOP mentioned in the advisory. The answer to these questions are different because on cannot estimate the number of the tourists.

The content of the travel advisory varies from country to country and destination to destination. But most of the common information are related with travel safety and security, health, entry and exit procedure and documents required, local laws and culture, weather and climatic conditions.

Travel advisory also share certain dos and don‟ts. It also highlights the emergency contact details for instant help during crisis situation. We should not forget that COVID 19 emerged as a crisis throughout globe and every country released advisory on travelling. Airlines also came forward with their advisories along with SOP, hotel industry opted their own SOP, and special guidelines were launched for tourist, tourism and destinations.

Sources of Travel Advisory: There are many sources of travel advisories but the significance lies in the fact that which are the reliable and authentic sources.

Statutory Bodies: The advisory in India in always being circulated through the government bodies like Ministry of Home Affairs, Ministry of Environment or Ministry of Tourism when it comes to deal with tourism. All the information are shared through their official websites and links. These are the most reliable sources of information.

Social Media: There are certain sources which are linked all together and spread travel advisory. These platforms are called as social media platforms. These are volunteering services and information may be reliable or unrealistic. Twitter, Facebook, LinkedIn, etc are counted in this form of source of travel advisory.

Traditional Media: Traditional media like radio and television also shares advisories but it is not possible that every time people are careful to read or listen advisories. It is also considered as a reliable source of sharing advisories.

Web Portals of Airlines, Hotels, Travel Agents and other officials dealing with the tourism: The official websites of the tourism stakeholders also helpful in offering essential information on tourism and related activities in their respective countries and areas. It also supports travelers in deciding their holiday packages.

COMMON PROBLEMS & CHALLENGES WITH HOTEL AND TOURISM DESTINATIONS SECURITY

Safety and security is utmost required over destination. The loss of life and theft of belongings of tourists along with protecting the ambience of destination is a prime concern. Any destination free from crimes is always a temptation for travelers. Though tourism is a recreational activity in which people travel because of some diverse motivation which we can say is not a cumbersome job. The people spend a quality time with hassle free job over the destinations. They seek a good hotel to stay and relax. If their stay and holidaying is full of misery and be spent with terror, what to describe it. Tourist and destinations are always targeted as a soft target for all types of crimes. Be it prostitution, drug puddling, late nights rave parties, gambling, looting, misbehave,molestation with the foreign tourists, cheating and theft are a common practice that have been observed during tourist season over destinations. It has become a common practice because there is no interference of the government organizations? If any case of crime is being reported the government fulfills the decorum of the task and report of such happenings never being shared in public domain. Let‟s discuss some of the common problems of safety and security of the destinations:

1. Terrorism in the form of lone wolves: There are certain individuals who are radicalized and are ready to sacrifice themselves for the unknown noble cause. This type of terrorism is caused due to identifying

2. Responsibility of Media: Many times it has been seen that media breed hysteria. A small incident is been narrated with such a twist that it becomes a blow out of proportion. The media gives an impression that the particular place is not safe place for visitors and thus tourism get affected.

3. Cyber Crimes: We are residing in such a world where things are just one click away. The plastic money is with us and it is being used for all types of payment made to airlines, hotels, shopping, food etc. For this purpose a computer set up is required which keeps an eye over all the billing process. The most of the fraudulent cases has been reported over the destinations are related to cybercrime in which all the personal e data are stolen and re used through morphed exercises.

4. Quality of food stuffs: The ingredients used by the hotels and restaurants are another treat to life because being a tourist we do not know the quality of the food stuff which are being used for food and beverages services. There is no such mechanism to check the quality of the poultry products, milk products and fruits and vegetables and even the preparation standards. Genetically Modified (GM) foods are highly demanded products but it is not good for health while Chinese salt (MSG) is a cancer causing substance which is often used in restaurants for preparation of Chinese dishes.

5. Lack of tourist police services over destinations: At many of places we do not find tourist police who is there to help tourists during crisis. Though tourism is an industry that supports GDP for many countries but it has been left unattended. A sense of security over destinations may lead to more satisfaction to the tourists. The helpline numbers provided by the governments may work for a particular time slot and sometimes there is none to pick the calls or if even picked up, the response team reaches the spot when everything is almost over.

6. Over Taxation: The tourism has been considered as a cash cow and it is the reason why the governments are imposing so much taxes particularly on tourism related services. It is their faith that tourists are richer and they are here to spend some money and travelers are not their vote bank. It hardly matters for such politicians to increase taxes. But the increased taxes will kill tourism and it will hamper the growth of economy. The local employment whose income is based on tourism flow only will be affected badly. There will be loss in the revenue as well.

The guests are always welcomed by hotels because it depicts Guest is God. The accommodation facility has been granted to everyone who is intending to stay and capable to pay. But there are also threat of security in the hotels as well. The details are given below:

1. **Unauthorized Visitors:** During season time the accommodation units are filled with guests and it is very difficult to identify who is authorized person and who is unauthorized. The hotels must have certain mechanism to check unauthorized person in the hotel premise.

2. **Theft:** The theft is a common problem which can be seen in almost every hotel. The belongingness of the guest and luggage are often picked up by someone who seems to be the hotel

employee but when it is enquired, it seems a spurious person who entered the hotel by pretending himself as an employee. Sometimes guests are also held responsible for carrying out theft in the hotel. The picking up of towels, soaps, ashtrays, hair driers,

T.V and AC remote are some of the common items which have been recovered from guests during checking out.

3. **Theft from Parking Area:** Parking area is most vulnerable to theft because once the vehicle is parked, it seems a guest is relaxed. By keeping all his belongingness in the car, he/she leaves for hotel. It is the high time when thieves are super active and break the glass of the car to pick up the valuable articles like laptop.

4. Disorderly Conduct: When a rock star, super star or cine star stays in a hotel, the public behaves rudely asthey want to get the glimpse of their favorite star. The crowd management is a big challenge because public can be rowdy and create ruckus. The potential damage to hotel property, people and vehicles cannot be ignored.

SECURITY ISSUES AT AIRPORTS, RAILWAY STATIONS, SINGLE WOMEN TRAVELLERS IN INDIA

The airports have been considered as very sensitive places that may harm many individuals together. After 9/11, all the countries reviewed their security management at airports and made strategies to overcome any awkward situation. The passengers at airports significantly represent a richer section of the society who has been categorized as IP, VIP and VVIP. They travel by air because they want to reach their destination on time. The security issues at airports does not concentrate on the passengers only but it also highlights baggage, cargo, fence checks, inspecting retail sections, enforcing checkpoints along with formulating and executing emergency plans relating to natural disaster, fire and civil threat. However, there are no such full proof system that may ensure 100% safety and security at the airport. There are certain issues which needs to be discussed.

1. Every airport has its uniqueness in terms of serving passengers. The security companies and personnel are trained as per the training manuals provided by the government agencies. However, it is highly suggested that the security personnel must be selected and identified to carry out special duties at airports. The special training and certification courses will enhance their qualification and practical exposure.

2. Automation is required at every airport because many a times we come to know that a dummy passenger entered the airport through a cancelled ticket. The security personnel are not aware whether the holder of the ticket is a genuine passenger. They check the print copy of the ticket and a valid identity proof but there is no such mechanism to trace the passengers entering airport premises with dummy tickets.

3. Safety of runways from wild animals are another concern because open area is always a fascination for wild animals who come out of their holes to run and prey. It affects the safe landing of the air crafts.

4. Clear Open sky for aircrafts is also required because bird hitting is a common phenomenon. The aircrafts are damaged and complains of engine failure often happen due to the bird hitting exercise. Many flights are cancelled due to engine failure and passengers are left stranded with no option.

5. Flights are also unavailable due to fog. The meteorological services at majority of airports get failed during dense fog in winters. The flights are remain cancelled or delayed due to operational reasons. Even sometimes the passengers are grounded to some other airports and from there they are sent to their final destination with some other alternate arrangements.

6. Airports are now a hub of beggars, homeless people, drug abuse and mentally ill people who loiter heather and thither in the airport campus without any reason. The movement of such people should be completely banned in the premises of the airport.

7. The public side of the airports are highly vulnerable when it comes to terror attack which may be confronted in the form of active shooting, baggage filled with explosives, ramming of vehicles into the airport area, weaponized drones etc.

8. The outrage scenes created in the flights by drunkard persons, sexual abuses and misbehave with the flight attendants and co passengers are another issue of safety and security.

9. Potential safety and security threats caused due to airport employee who is indulged in supporting and assisting terrorist. The person can get involved in smuggling drugs, weapons, money laundering etc. Recently, a flight attendant was caught with carrying foreign currencies illegally and that were kept in food pouches, supposed to be served to the passengers with freshness during journey. The direct access to the aircraft might have motivated miscreants to indulge into this type of crime.

Security issues at Railway Station: Railways are the backbone of Indian passengers because millions of people travel from one place to another. The railways stations are most vulnerable in safety and security because of number of persons available at a time. The safety and security at the railway station is divided into the following parts:

1. Safety and security of Passengers and their belongingness
2. Safety and security of Railway Assets
3. Safety and security of Trains
4. Safety and security of Employees

The major challenges which a railway station may face fall under the category of terrorism, fire, abandoned luggage, entry to restricted area, evacuation process during any emergency situation without much harm. Railway stations are also home to differently abled people, beggars, orphans, widows, young and small children, unauthorized persons and nobody is there to bother. The antisocial elements also become active during night time and always waiting for their preys. The thieves are always waiting for a suitable time to pick the belongingness or pocket of passengers

who is standing in a que for ticket, enjoying tea in the cafeteria or busy in chit chat with their friends and relatives. The other group of the miscreants are there to wait for the trains to be into the sheds where they can exercise their motives of theft and other illegal activities.

Security issues relating to female solo travelers in India: It has been a debatable topic whether India is safe for female solo travelers. There is a mix response against it. Those who have seen India with in its proximity, have different opinion. However, the common issues which is confronted by majority of the female solo travelers are discussed below:

1. Eve teasing, sexual assaults and attacks: Many of the female travelers have shared their experience of sexual assaults and attacks at destination places, trains and public transport. The individual or group of persons are often indulged into this type of activities.

2. Heat, dust and noise: This is a common issue of every destination. The poorly designed destinations are full of dust and noise and above all the prevailing climatic conditions of the Indian subcontinent is also responsible for creating nuisance to the travelers.

3. Staring, groping and stalking: The solo female travelers are always a prey for anti –social elements. Such elements always keep an eye over such female solo traveler/s (soft target) who can easily be victim. The need of the hour is to protect such travelers from miscreants through certain strict rules and regulations.

4. Getting Sick and feeling lonely: The major challenge with solo traveler is to take care of herself during any emergency situation. If she is ill, sick or met out with any awkward situation, who should be there to take care for her.

5. Friendliness behavior as a part of culture: The solo female traveler, if shows her friendly behavior towards a person, it should not be understood as a symbol of something but it should always be welcomed as a healthy.

However, there is no hard and fast rule to curb safety and security issues pertaining to solo female travelers in India but it the sole responsibility of the concern herself how she is reacting/ tackling any awkward situation. The emergency contact numbers and women helpline numbers are always displayed at eye catching points in the cities, the local police station is also marked. It is also advised to such travelers that they should take extra precaution while traveling to destinations. Even general advisories are also issued by the governments time to time. Late night movements in case of pick up and drop from airports railway station, use of late night public transport and parties are always discouraged especially for solo travelers.

TOURIST POLICE AND ITS ROLE / TOURIST FACILITATION AND SECURITY ORGANIZATION (TFSO)

In the previous contents we have seen how important a tourist is for a country. To provide safety and security to the tourists is top priority for nations whose economy is fully depending on tourism. In India also the advocacy started for establishing certain organizations/institutions who can be helpful in offering safeguard to international and domestic tourists at various destinations. To

maintain law and order and to provide safety and security to the tourists is the task of states. Some of the states have already deployed tourist police at prime destinations from their existing police personnel. But due to certain limitations and constrains it was not a wise decision to pull personnel from main corpus. Therefore, the concept called "Tourist Facilitation and Security Organization" was launched by Government of India to fulfill the purpose of providing safety and security to the tourists at destinations, counsel tourists for their safe visit to destinations and to help them in their seamless movement within the state. The added advantage is that the personnel employed are well trained and capable to facilitate and guide tourists in many ways. To encourage states and union territories against establishing Tourist Facilitation and Security Organization (TFSO) the central government is offering partial financial assistance (seed money) for the initial years.

Funding: For the initial three years from the date of establishment, the central government will bear fifty percent of the expenditure incurred on this project. The remaining fifty percent (matching share) will be borne by the respective state governments and union territories. For the next three years, the Government of India will bear 25 % share while remaining 75% will be met by the concerned state/ union territories.

Pilot Project: Initially three states Uttar Pradesh, Rajasthan and Andhra Pradesh were identified for implementing this project. It was decided that certain individual destination/ circuit will identified from these concerned states. To check the effectiveness of the pilot project, Kushinagar and Shravasti from Uttar Pradesh, Jaipur from Rajasthan and Golconda Fort from Andhra Pradesh were chosen.

Deployment of TFSO Personnel: Initially, they were deployed at tourist places assigned with the responsibility to escort the tourist group with in the destination or circuit. They were also deployed at railway station, bus stands and airports or at any place where there deployment is required.

Role and responsibility of TFSO Personnel: The major role and responsibility of TFSO are:

a. To maintain safety and security at the destination and report the crime if any against tourists to the local administration/ nearest police station.

b. To provide necessary information to the tourists for their smooth movement at the destination.

c. To make aware tourists about the do‟s and don‟ts of the place, also about the activities of touts and undesirable elements. It will also include the reporting of such cases to the higher authority in curbing the situation.

d. To report any emergency situation related to tourists to higher authorities.

e. To assist in loss and found activities along with managing traffic and crowd.

f. To check unscrupulous practices like gambling, alcohol consumption, drug trafficking or illegal selling of liquors.

g. To ensure cleanliness of the destination by advising the tourists to throw their litters at designated places.

Tourist Police: In some of the states where TFSO personnel are not working, it is the tourist police who is taking care of tourist destinations and tourists. In general term,a police is a civil force that is responsible for detecting and preventing crime and to maintain law and order. Similarly, a tourist police constitute the similar task but specifically for tourist and tourism. If we turn the history of tourist police in India, it is the Goa state who formulated and executed the concept of tourist police somewhere in 1990. It not only ensured safety and security of the tourists in and around Goa but also helps tourism department in implementing the provisions of Goa Registration of Tourist Trade Act 1982. As per NDTV report, currently tourist police is active in 16 states and carrying out the following duties and responsibilities:

a. To control crime and maintaining law and order over the destinations.

b. To obtain and collect information relating to the person/s indulged in crime/s over the destination and vigilant over such culprits.

c. To ensure that all the crimes reported and registered with the support of tourists.

d. To curb the movement of the unauthorized persons, beggars, hawkers, touts at the destination.

e. To ensure hassle free movement of the tourists at the destination.

f. To provide emotional support to the tourists during any mishap like cheating, theft etc.

g. To share information related to locations, facilities, transport system, authorized shops and shopkeepers, medical emergency prevailing over the destination.

h. To assist tourist in identifying right type of accommodation, transportation and other services.

i. To intervene in the events like pick pocketing, eve teasing, molestation, drug trafficking and consumption.

j. To sensitize tourists regarding local ethos, rules and regulations, do‟s and don‟ts, law and order, special permits and security conditions at destination.

k. To inform tourist about the procedure of foreign currency exchange and direct such tourist to approach right banks and counters for the same.

l. To act as a liaison with FRRO during immigration situation at entry and exit points.

m. To restrict the entry of unauthorized/ unlicensed tourist guides at the attractions and destinations.

Tourist Police Station: It refers to any kiosk, place or post designated by the state government to offer policing services to the tourist at the destination. This tourist police post will work under the supervision of SP/SSP. This police station will be established either in permanent shape or moveable set up of fiber or glass furnished with a tables, chairs, small wardrobe and toilet facility. The establishment should be eye catching with a mixture of dark colors, clearly visible from a distance. The name of the tourist police station along with logo should be displayed, the slogan

Incredible India should also be engraved to make aware the tourist about the brand of India tourism.

Deployment of Tourist Police: The provision of deploying tourist police includes major tourist attractions that includes monuments falling under world heritage sites, entry and exit points like railway station, airports and bus terminals. Along with this, the police can be deputed to major religious shrines, shopping areas, entertainment areas where tourists interacts with touts, hawkers and shopkeepers. The deployment will ensure the hassle free movement of the tourists at these places and it will also build the sense of confidence among them.

It may be concluded that tourism is a leisure activity and it should not be hampered because of any unscrupulous practice. To check such practices and to maintain law and order over destination is a prime factor if we really want to promote tourism and talk about customer satisfaction. The tourist police can be a helpful hand in curbing negativity over destinations.

ROLE OF MINISTRY OF TOURISM, GOVT. OF INDIA / UNWTO GUIDELINES / ADVISES ON SAFETY AND SECURITY

Ministry of Tourism, Government of India is an apex body that deals with tourism in India. It talks about policy, planning, development and promotion of tourism. It also makes collaboration with various stakeholders, state tourism boards and other central institutes for the smooth running of tourism industry in India. The ministry also acts as a regulatory body in framing policies related to boosting tourism in India like Visa on Arrival, infrastructure development, safety and security issues, tourism education and man power etc.

The Ministry of Tourism, Government of India was set up in the year 1967 and Dr. Karan Singh was appointed as a maiden minister. Since then MOT is progressing neaps and bounds, The MOT, GOI has been charged with the responsibility to do a number of tasks that fall under the following category:

1. Policy Formulation that includes all types of policies pertaining to Tourism Development, Incentives, man power development, promotion and marketing of India as a destination, and above all attracting FDI for this sector.

2. Planning and Development of Destinations through the joint efforts of state tourism boards, and other ministries.

3. Infrastructure Development required for tourism in the country.

4. Developing Human Resources required for tourism industry in India.

5. Publicity of materials and formulation of appropriate marketing campaign for tourism destinations.

6. Research, analysis, monitoring and evaluation of various ongoing tourism projects.

7. Creating platform for international co-operation through various international bodies, bilateral agreements, overseas technical collaboration and external assistance,

Ministry of Tourism, Government of India's stand on Safety and Security: The MOT in its policy released in the year 2007 concentrates on 7 S points of tourism development. Out of this 7S, one and very prominent in "SURAKSHA". The MOT in his advises talks about the following issues when it comes to deal with safety and security:

1. It promotes tourism activities to be undertaken with dignity, safety and freedom from exploitation for all the stakeholders.

2. It advocates to prevent illegal happenings like prostitution, sex tourism, molestation and assaults with tourists over the destinations to provide safety of persons, in particular women and children.

3. It also focuses on preventing the consumption of drugs (forced or involuntary)over destinations and cultural and social intolerance which could increase vulnerability to crime.

Application: The code of conduct (COC) shall be strictly adhered by the owners, suppliers, contractors, employees of the travel and tour sector including hotels, restaurants, lodges, guest houses, tour agents, entertainment establishments etc. In addition, it shall be applicable to service providers like event management organizations, entertainment providers, transport operators like taxis, buses, tour guides and other services or agencies associated with the tourism sector.

Safety and Security Guidelines (For Industry): The Tourism management will provide training and management to their staff members to ensure safety and security of tourists, local people and staff members at their place. All the stakeholders will appoint personnel to look into the matter if all the safety measures have been strictly adhered. In case of any incidence of exploitation, the entrusted person will report the correct issue to the appropriate higher authority who will ensure the strict action to be taken against such miscreant.

Public Awareness and Guest Notification (Tourist): The information related to exploitation or any kind of intolerance reported at the place must be displayed/ visible to the tourists, employees and the local people. Such information can also be shared through company‟s website, brochure, hard copy of entry tickets, bills, manuals in the hotel room etc. The information related to child trafficking, child sex tourism, prostitutions, pornography, molestations, sexual assaults can also be shared with the guests. In order to minimize intolerance with the tourists at the destinations, the visitors should be informed through various social media platforms regarding the local, cultural and social ethos prevailing over destinations. It will enable tourists to dress, conduct and respect local culture. This will reduce the harassment of the travelers. The officials of tourism department are also supposed to assist foreign tourists with safety tips like places of interest, timings, dressing sense, do‟s and don‟ts while roaming alone and acceptance of eatables from unknown persons. They will also share information pertaining to touts and unauthorized tour operators prevailing

over destinations. Such officials will encourage travelers to consult official website of Ministry of Tourism, Government of India for any further assistance. The emergency contact numbers and helpline numbers must be shared with travelers to contact during any emergency. The women helpline nember1091, child helpline number are always displayed over prime locations, destinations and public transport.

UNWTO Guidelines/ Advises on Safety and Security: There are four important areas which can be considered as risk originating and safety and security is required utmost. These are:

a. Human and Institutional area (outside the tourism sector): The incidents such as pick pocketing, theft, assault, burglary, rape and harassment, organized crime, terrorism, civil unrest caused due to political, social and religious issues are some of the examples of human and institutional area.

b. Tourism and other related commercial areas: Defects in safety standards services offered by tourism entrepreneurs, non eco -friendly tourism enterprises, lacking with the safety and security environment, practicing fraudulent activities while dealing against offering tourism services, personal attacks are some of the examples falling under this category.

c. The individual traveler: Certain threats are sometimes caused by the individual tourist as well. The examples are visit to risky areas, indulging into unlawful activities, loss of valuables, documents etc caused due to inattentive approach, indulging into excess and over enthusiastic practices of tourism specially in driving, drink and food,

d. Environmental risk: The tourists may potentially be exposed to various environmental threat because they are not aware of the natural features of the attraction, flora and fauna, the type of medical emergency existing,medical procedure (vaccination) to be followed for visiting those destinations, the precautions taken while eating local cuisines and emergency situation created due to the vulnerability of the destination.

UNWTO Initiative: The UNWTO primarily focuses on creation of National Tourism Administration (NTA) to look into the mater pertaining to safety and security. It has advocated for a coordination among various stakeholders/organizations to accomplish the goal of maintaining safety and security. The coordination can be done with the following:

a. The government organizations in the concerned countries which are closely related with tourism and directly or indirectly deals with it.

b. Communities whose interest lye in Tourism

c. Representatives of Tourism Industry

d. The Media

It has been further suggested by UNWTO that the success of the coordination lye‟s only when National Tourism Council (NTC) will be formulated as an apex body to look into the maters

associated with safety and security. But the mere formation of NCT will not be enough to accomplish the goals of safety and security but it will further create a National Safety and Security Committee by comprising members from the following Indian government agencies:

a. National Tourism Board

b. Police Department

c. Immigration Department

d. Judiciary Department

e. Customs Department

f. Transportation Department

g. Health Department

h. Ministry of External Affairs

i. Ministry of Social Welfare/ Civil Defense

j. Airlines Operators (Government and Non -Government)

k. Hotel Operators

l. TAAI

m. IATO

n. FHRAI

o. Consumer Group

p. Retail Trade Organizations

q. Research Centers focusing on safety and security oriented researches

Policy and Planning: The policy on safety and security would comprise the following:

a. Principles, Goals and objective to fulfil the primary set up

b. Clarity in guidelines so that reinforce agency may act accordingly

c. Need to recognize tourist safety and security as a vital element

d. Need of Resource sharing formulae fit for every key player

Plan for Action: The plan for action should address the following:

a. Identification of potential tourists risk likely to occur over destinations and during travel.

b. Detective and preventive mechanism in curving safety and security issues of tourists.

c. Providing an ambience to the locals and tourists free from drug.

d. Protecting destinations and facilities form the illegal interference.

e. Sharing of the Information related to safety and security issueswith international travel trade.

f. Creation of an organization specifically dealing with natural disaster or emergency.

g. Adopting safety standard and operating procedures at destinations and tourist facility centers related to fire, theft and health.

h. Developing liability rules at the tourist facility centers.

i. Consideration of safety and security aspects while providing license to restaurants, hotels, transport operation and guiding.

j. Provision of sharing accurate information on documentation related with safety and security to both out bound and in bound travelers.

k. Creation of a national policy pertaining to tourist health and reporting procedure adopted by a tourist while dealing with health problem.

l. Developing special insurance packages for tourists.

m. Collection and dissemination of genuine information/data related with crimes against travelers.

INTERNATIONAL ISSUES ON TOURIST SECURITY

Tourist safety and security has been major consideration since the inception of the movement of people either for pilgrimage, trade and commerce or tourism. The nature of crimes against tourists have been change but it has not been abolished. The safety and security issues has also jumped from basic necessity to utmost requirement. The nature of crime witnessed against travelers sometimes 70-80 years back used to be soft but not hard. In present scenario, the crime has been converted from soft to hard and now it is being categorized as heinous. Istvan Kovari and Krisztina Zimanyi shares many information on tourist security through their research article “Safety and Security in the age of Global Tourism (The Changing role and Conception of Safety and Security in Tourism)”. In this research paper the researchers have highlighted a sequence of safety and security which were prevailing some 75-80 years back. According to them, during the period of 1950 – 70, the primary focus was on health and hygiene that included vaccination, drinking water issues and cleanliness of toilets. These problems were localized and restricted to certain geographical area. They were not harming the tourism as a large and even these issues were never discussed on international forums and solution to such problems (safety and security) were left with the concern national authorities.

During the period of 1970-90, few of the incidences really became thought provoking issues. The high jacking of airlines, bomb blasts, terrorist activities, civil unrest and wars proved to be additional risk factors. It was for the first time when WTO (now UNWTO) considered safety and security as a major component to tourism. It passed certain directives to tourist generating countries through its Hague Declaration planning and policy.

Now we are living in the era of Global tourism with a slogan "Earth is our family". Tourism gradually flourished with this concept but with the increase in number of tourists globally it attracted many issues and challenges. It was stated that tourist and tourism cannot harm anyone but blessings always come in disguise. The negative impacts of such inflows were witnessed by many communities. Drug puddling, prostitution, showmanship, molestation, misbehave rape and killing became common issues, theft and looting and evidences of cross cultural incidences increased over destinations tremendously. The demand of some special type of treatment in tourism sector motivated people to indulge into child trafficking, sex tourism, drug tourism, rave parties and even call girls. Some of the destinations became pioneer in attracting special interest tourism. Terrorism has identified tourism as a soft target to attack. Very often hotels and restaurants become the victim of such organized terror. The innocent people who has nothing to do with such miscreants are killed. Taj and Oberoi hotels at Mumbai witnessed the killing of more than 200 people who were there to enjoy their vacations.

However, it is proclaimed that tourism brings income to the country, promotes brotherhood and focuses on peace, but the modern tourism has become a burden to the host country because there is always a debate who should be considered first when it comes the mater of resource sharing, tourist or host community. Even when the countries are engaged in searching the solution of their own issues and challenges, tourist safety and security becomes secondary to them. So, in this condition tourist can be left to take care of themselves. So far as international issues on tourism security is concerned, it talks more or less on the following:

1. Political Security
2. Safety, health and Sanitation of tourists
3. Safety related to personal data
4. Legal protection of tourists through consumer protection act (in case of cheating or theft)
5. Safety on Communication
6. Protection against Disaster and natural calamity
7. Protection against unauthentic information related to place of interest, shopping, accommodation received while visiting a destination

THE ROLE OF INSURANCE IN THE TRAVEL INDUSTRY

As we tourism has been considered as a charming industry that allows people to move from one place to another. It is the presumption that the tourists belong to richer society and carry money either in hard cash and plastic money. The place they are visiting is new to them and they do not know anything about that place except the basic information shared through internet. The risk can be confronted at any point of time and even it cannot be predicted. The potential risk can be categorized into Social, Environmental and Political. The social threat can be witnessed in the farm of physical harm, molestation, theft, eve teasing etc. Environmental risk is accountable against natural calamity and disaster which is unpredictable and may likely to happen over destination at any point of time. The political condition decides the future of tourism in that very country. The country‟s policy itself describes whether such communities are happy to host foreign guests or not. If the country itself indulged into civil war and unrest, it is very difficult to expect tourism as a tool to poverty elevation.

Insurance in the travel industry is equally important as transport, accommodation and food. It protects an individual tourist from economic loss to loss of life caused due to any unforeseen circumstances. The insurance isdivided into the perspectives of sociology, economics and legal and that has the ability to offer compensation against the damages caused to the social groups. As we know, tourist can be exposed to different types of risk as soon as they leave their surroundings for an unknown place. The sources of risk may vary from minor injury caused due to transportation services to loss of life caused due to natural calamity, theft of belongings and valuables, loss of money due to technical faults. However, we can classify tourism hazards in the following categories:

1. Natural hazards caused due to earthquake, flood, volcano, thunder and tornado, hail etc.

2. Political hazards caused due to human behavior like civil unrest, crime, terrorism, drug puddling, violence, riots etc.

3. Biological Hazards caused in the form of pandemic, spreading of virus (COVID19) from one place to another etc.

4. Technological hazards caused due to technical glitches, cyber-attacks, hacking of emails and passwords etc.

How insurances are beneficial to tourists: A loss can be incurred to a traveler in the following ways:

1. Loss of the physical properties like passport, articles of personal use, valuable items etc.

2. Legal liability on the part of service provider like discrepancy in promised services (breach of contract) and delivered services, delivery of faulty items, non-valued services etc.

3. Personal loss on the part of traveler caused due to consumption of bad quality of food and beverages, negligence on the part of vehicles used for commuting, death caused due to natural reasons, killing and murder are caused due to socialization etc.

Insurance is part and parcel of tourism business. It is also an integral part of the risk management. Every business follows a kind of insurance plan and this plan determines the nature of the items to be insured. It also focuses on the types of assets and hazards which needs to be covered through an appropriate insurance policy. It should be brought to the notice that insurance never guarantees that the things will never turn out. It does not make activities safer and never talks to reduce nor stop the possibility of incidents from happening rather it is a matter of post incident activity of the risk management process. Generally, tourists opt individual insurance packages which are not being covered through normal travel insurance plans. Both individual tourist and service provider insure themselves against the risks as a precautionary step and thus minimizes the negative impact of certain future risk covered through insurance plans.

Areas of insurance policies to be considered in tourism: The insurance policy covers the following losses:

1. Insurance against baggage lost.
2. Insurance against personal accidents.
3. Insurance against illness and hospital admission expenses.
4. Insurance against damages caused due to the negligence part of airlines, railways, public transport etc.
5. Insurance against covering cost in case when the tourist failed to reach the destination or the trip was terminated but failed to receive amount back.

To conclude it can be said that insurance policies are available in wider form. It starts with the tourists as soon as he/she leaves his/her house and till the time he/she returns home after spending a quality time. The insurance policies are also available to cover the protection of the property which may be potentially targeted by the house burglar, fire etc.

Safety and security is a prime requirement in tourism industry. The host community should be taught for the significance of tourism in their daily life, the destinations should be developed in such a manner that it should reflect tourist centric. The government should formulate and execute policies to keep way touts, beggars, drug peddlers, miscreants, anti-social elements, criminals etc out from the destination areas or their entry should be banned. A sense of security should be provided by the government either through implementing strict law and order in compliance with

the police personnel over the destinations. The issues of eve teasing, exploitation, molestation, rape, theft and cheating, misbehave etc with the tourists have been reported which brings a negative image of destination in international market. The introduction of tourist police or tourist friends can be a solution to it. The travelers are also advised to go through the travel advisory which are being displayed on the UNWTO official sites or on the official government sites of the respective counties. The travelers are also advised for the travel insurances which are available in readymade and tailored made options and offered by MNC.

Consumer Perception: It is referred as awareness of customers, their impressions and their opinions about a particular business, products or brand.

Tourism Security: The invaluable services offered by private security experts, personnel of police departments to serve tourists and destinations, in hotels or convention centres, or at casinos or events.

Travel Advisory: It is an official warning statement issued by government agencies to disseminate information related to the safety of travelling to or visiting one or more specific foreign countries or destinations.

Tourist Police: A special police force deputed at important places flocked by tourists and entrusted with the responsibility to provide assistance to tourists to save them from being cheated, harassed etc.

Insurance: Insurance is a contract, represented by a policy, in which an individual or entity receives financial protection or reimbursement against losses from an insurance company. The company pools clients' risks to make payments more affordable for the insured

RESTRICTED AND SPECIAL AREA PERMITS FOR FOREIGN TOURISTS IN INDIA AND THEIR PROCEDURE TO OBTAIN

Though the tourists can visit all the places in India once their visa is approved but this visa authorization does not entitle visitors to visit certain areas which Government of India has declared “Restricted for Foreigners”. Most of the restricted areas fall under the border areas and are very sensitive in nature. The motive behind imposing the restriction is to ensure national security along with protecting the culture of the indigenous aboriginals. These restricted areas are not similar to the normal tourist destinations which can be visited by everyone but the seekers will have to apply separate passes to explore. The temptation of these restricted places lie in the fact that they are abundant in untouched natural beauty. As per the provisions of the Foreigner’s Act the foreigners will have to show Protected Area Permit (PAP) while entering into these restricted areas whereas the Indian nationals who are not the residents of those areas will apply for Inner Line Permit (ILP) to explore restricted areas. So far as the NRI, PIO card holders and OCI holders are concerned, they will have to apply for PAP. In recent development, the places like Darjeeling in West Bengal, Tripura, Assam and Meghalaya have been excluded from the list of the restricted areas. The

prerequisites to obtain PAP is that the travelers must be in a group of four. The state like Nagaland has lifted the PAP requirement against such applicants who are married and are accompanied by a registered travel agent or tour operator. Such travelers are allowed to enter and exit to certain designated places only. However, the national of China, Myanmar, Pakistan and Bangladesh will receive PAP only after the clearance from Ministry of Home Affairs.

Initially, the Protected Area Permit (PAP) is issued by Ministry of Home Affairs for a period of ten days and it can be extended to another seven days. The application for which must be processed at least fourteen days prior to scheduled visit. This PAP can also be obtained from the authorities of the concerned states, FRRO and Indian Mission abroad.

The details of the Restricted Areas located in each state is given below:

1. **Andaman and Nicobar Islands**: All the parts of this island are restricted for foreigners and the foreigners intending to visit this island needs prior approval. This authorization can either be obtained on arrival at Port Blair through immigration Officer or can be obtained in advance from the office of Chief Immigration Officer (CIO) located at International Airports of Delhi, Mumbai, Kolkata and Chennai. The permit can also be received from the FRRO, MHA and Indian Missions located abroad.

Important: If the foreigner has arrived by air, he/she can be granted permission to stay for a period of 30 days by the office of competent authority located at Port Blair airport itself. But such foreigners who are arriving in Andaman Nicobar Islands by sea route needs PAP in advance because the tickets are being purchased only by producing the document.

Under this authorization, day and night visits are allowed at the following places:

A. Municipal Area, Port Blair

B. Havelock Island

C. Long

D. Neil Island

E. Jolly Buoy

F. North and South Cinque

G. Red Skin

H. Entire Island of Central Andaman

However, night stay is permissible at the Islands of Mahatma Gandhi Marine only after the special approval of U.T. Administrator.

Only day visits are allowed to the following placed:

A. Mayabunder

B. Diglipur

C. Rangat

D. Mt. Harriet

E. Madhuban

F. Ross Island

G. Narcondum Island

H. Interview Island

I. Brother Island

J. Sister Island

K. Barren Islands

2. **Arunachal Pradesh:** The places like Along, Bhalukpong, Itanagar, Miao, Namdapha, Pasighat, Sujesa and Zero are restricted for foreigner‟s movement. All the foreigners seeking to visit Arunachal Pradesh in a group require prior permission and which can be obtained from the office of Home Commissioner, Government of Arunachal Pradesh located in Itanagar. The permission can also be granted by the Foreigner‟s Regional Registration Office located at Delhi, Mumbai and Kolkata. One can also contact Indian Missions located abroad in this regard. No individual tourist is allowed to enter in the restricted area. The applicant can apply at least four weeks prior to their departure. Indian citizens can receive their permission from the office of the Arunachal Bhawan located at New Delhi, Kolkata, Guwahati and Tezpur.

3. **Assam:** The places like Guwahati, Sibsagar, Halflong, and Kaziranga are opened for the foreign national who are intending to visit in a group of four members or more. The prior permission can be obtained from the office of Assam State Tourism Development Corporation located in New Delhi and other parts of Assam state. The tourists have to provide their passport size photograph, copy of the passport and visa in order to receive the permission.

4. **Gujarat:** The border area of Rann of Kutch falls under the category of restricted area. The permits are being issued to both foreigners and Indian nationals by the District Collector, Bhuj to visit up to Banni region and few other places beyond the India Bridge.

5. **Himachal Pradesh:** Lahul, Spiti and Kinnaur district are the restricted areas located in Himanchal Pradesh and the permission can be obtained for a group of four or above from the office of the Deputy Commissioner located at Shimla, Kullu, Keylong and the District Magistrate office located in Rampur. The permission can also be obtained from the office of Commissioner/ Resident Commissioner (Tourism), Government of Himachal Pradesh, DGP HP located at Shimla.

6. **Kashmir:** The places Khaltse, Dunkhar, Sroduchan, Hanudo, Biana, Dhafalling under Khaltse region, the trekking passes located in Nubra sub division like Leh- Khardung La-khalsar-

Trit- Panasik, Leh- Khardung La- Khalsar-Hunder and Leh- Sabo-Digar La-Digar-Labab-Khungru Gampa-Tangar are opened to foreign nationals strictly for trekking purpose only and that can be conducted by the registered travel agency/tour operator and accompanied by police personnel from Jammu and Kashmir state. The trekking passes falling under the jurisdiction of Nyona Sub Division like Leh-Upshi- Chusathang-Mahe-Puga-Tso-Moari- Lake/Korzok area, Leh-Upshi-Debring-Puga-Tso-Maori Lake/Korzok area, Leh- Karu-Chang La-Durbuk- Tangtse- Lukung-Spanksit and Pangong lake upto Spanksik are opened to foreigners for trekking purpose only. The permission can be obtained from the Ministry of Home Affairs (MHA) or the office of District Magistrate can be contacted. The permission will not be granted to any individual tourist and the maximum period for which the permission is granted for seven days. The permission is granted to a group of members comprising four to twenty persons. A liaison officer needs to be accompanied by the group to ensure travel on identified tour circuits only.

7. **Lakshadweep:** Only Bangaram Islandand Suheli Islands are open for foreign nationals who can receive permission to visit Bangaram from the FFRO office or Lakshadweep Administration office located at Kochi. However, Indian nationals may receive their permit from the Commissioner office located in New Delhi. For Aggati Islands, an entry permit is required for both, foreigners and Indian nationals as well.

8. **Manipur:** The locations like Lohtak Lake, Imphal, INA Memorial, Deer Sanctuary, Waithe lake Kongjam War Memorial are only open for tourists. The prior permission for which can be obtained from MHA and FRRO‟s. Home Commissioner, State Government of Manipur can also be contacted for entry permission. The permission is granted to a maximum period of 10 days and to the group of 4 or more persons travelling together.

9. Mizoram: The areas like Vairangte, Thingdawl and Aizawl are protected. The entry permit can be obtained from the Resident Commissioner, Government of Mizoram located in Aizawl. The FRRO‟s office located at Delhi, Mumbai and Kolkata are also entitled to release entry permits for foreigners if travelling in a group of four or more members. However, in Chennai Chief Immigration Officer can be contacted for this purpose. This permission is provided for a period of not more than 10 days. The entry permission can also be availed through Indian Missions and application must be put forward 4 weeks prior to scheduled departure.

10. Nagaland: The places located in Dimapur, Kohima, Mokochong and Wokha are declared as restricted area for foreigners and the entry permit can either be obtained from all the Indian Missions located overseas or through the FFRO‟s offices located at Delhi, Kolkata and Mumbai. The Chief Immigration Office located at Chennai is also handful in providing special permits to foreigners. Ministry of Home Affairs, Government of India can also be contacted for the same. In some cases the Resident Commissioner/ Home Commissioner, the State Government of Nagaland can also be approached for obtaining special permits.

11. Rajasthan: Certain places falling near by the international border has been declared as protected area and prior permission is required to enter into it. These places are located in a belt of 40 kilo meters from the international border.The places like Suratgarh, Bikaner, Gajner, Kolayat, RamDevra, Pokran, Jaisalmer, Fatehgrah, Bhadewa, Barmer, Sanwara, Gandhwa, Dhamuna

falling in and around National Highway 15 running between Sriganganagar to Sanchoreare restricted area and foreigners need to get prior approval (Protected Area Permit) from Ministry of home Affairs/District Magistrate of the concern areas to explore the area.This permit is extended to the foreigners visiting in a group of two or more and for a period of 30 days.

12. Sikkim: The places like Gangtok, Rumtek, Phodang, Pemayangtse, Khecheperi and Tashiging are partially open for foreign tourists and permission can be obtained from many authorities like Ministry of Home Affairs, FRRO, Indian Missions, Immigration Offices located at Mumbai, Kolkata, Chennai and Delhi international airports, Home Secretory, Government of Sikkim, Gangtok, IG (Police) Government of Sikkim and from the office of Deputy Directors (Tourism) located in New Delhi and Kolkata. For Zongri (West Sikkim), only trekking sites are opened for foreigners but in a group of 4 or more. The main compulsion is that the group should be accompanied by the liaison officer. The permission is granted for a period of 15 days. The place like Tsangu can be explored as a day visit and the permission can be obtained from the Home Secretory, Government of Sikkim, Gangtok. A five days permit is issued to the group of foreigners visiting the areas like Mangan, Tong, Singhik, Chungthang, Lachung and Yumthang by the authorities like Home Secretory or Secretory Tourism, Government of Sikkim.

13. Uttarakhand: The places like Nanda Devi Wild Life Biosphere located in Chamoli and Uttar Kashi districts, Niti Ghati and Kalindi Khal and adjoining areas of Milam Glacier are partially protected areas and permission for the Protected Area Permit (PAP) can be obtained from Ministry of Home Affairs, Government of Uttarakhand and DM/SDM of the respected areas if the foreigners are travelling in a group of four or more on a sponsored trip organized by a recognized travel agency in India.

Vulnerability and Risk

What is Vulnerability?

Vulnerability describes the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard. There are many aspects of vulnerability, arising from various physical, social, economic, and environmental factors. Examples may include:

- poor design and construction of buildings,
- inadequate protection of assets,
- lack of public information and awareness,
- limited official recognition of risks and preparedness measures, and
- disregard for wise environmental management.

Vulnerability varies significantly within a community and over time. This definition identifies vulnerability as a characteristic of the element of interest (community, system or asset) which is independent of its exposure. However, in common use the word is often used more broadly to include the element’s exposure.

The above explanation was taken from the United Nations (UN) International Strategy for Disaster Reduction (ISDR) Terminology on Disaster Risk Reduction. Follow the link to look up other terminologies.

There are four (4) main types of vulnerability:

1. **Physical Vulnerability** may be determined by aspects such as population density levels, remoteness of a settlement, the site, design and materials used for critical infrastructure and for housing (UNISDR).

Example: Wooden homes are less likely to collapse in an earthquake, but are more vulnerable to fire.

2. **Social Vulnerability** refers to the inability of people, organizations and societies to withstand adverse impacts to hazards due to characteristics inherent in social interactions, institutions and systems of cultural values. It is linked to the level of well being of individuals, communities and society. It includes aspects related to levels of literacy and education, the existence of peace and security, access to basic human rights, systems of good governance, social equity, positive traditional values, customs and ideological beliefs and overall collective organizational systems (UNISDR).

Example: When flooding occurs some citizens, such as children, elderly and differently-able, may be unable to protect themselves or evacuate if necessary.

3. **Economic Vulnerability.** The level of vulnerability is highly dependent upon the economic status of individuals, communities and nations The poor are usually more vulnerable to disasters because they lack the resources to build sturdy structures and put other engineering measures in place to protect themselves from being negatively impacted by disasters.

Example: Poorer families may live in squatter settlements because they cannot afford to live in safer (more expensive) areas.

4. **Environmental Vulnerability.** Natural resource depletion and resource degradation are key aspects of environmental vulnerability.

Example: Wetlands, such as the Caroni Swamp, are sensitive to increasing salinity from sea water, and pollution from stormwater runoff containing agricultural chemicals, eroded soils, etc.

What is Risk

Risk (or more specifically, disaster risk) is the potential disaster losses (in terms of lives, health status, livelihoods, assets and services) which could occur to a particular community or a society over some specified future time period. (Reference UNISDR Terminology)

It considers the probability of harmful consequences, or expected losses (deaths, injuries, property, livelihoods, economic activity disrupted or environmentally damaged) resulting from interactions between natural or human induced hazards and vulnerable conditions.

Risk can be calculated using the following equation: Risk = Probability of Hazard x Degree of Vulnerability.

There are different ways of dealing with risk, such as:

- Risk Acceptance: an informed decision to accept the possible consequences and likelihood of a particular risk.
- Risk Avoidance: an informed decision to avoid involvement in activities leading to risk realization.
- Risk Reduction refers to the application of appropriate techniques to reduce the likelihood of risk occurrence and its consequences.
- Risk Transfer involves shifting of the burden of risk to another party. One of the most common forms of risk transfer is Insurance.

Disaster management: Floods, Earthquake, Cyclones and Landslides

A disaster (Fr. desastre=bad star) refers to sudden serious disruption of normal functioning of a society, involving large damages to life, property and environment, beyond its ability to cope with its own resources.

It can be natural or man-made

A natural disaster is a natural process or phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage. E.g. agricultural diseases & pests, damaging winds, drought and water shortage, earthquakes, emergency diseases (pandemic influenza), extreme heat, floods and flash floods, hail, hurricanes and tropical storms, landslides & debris flow, thunderstorms and lighting, tornadoes, tsunamis, wildfire etc.

Man-made disaster: Human-instigated disasters are the consequence of technological hazards E.g. hazardous materials, power service disruption & blackout, nuclear blast, radiological emergencies, chemical threat and biological weapons, cyber-attacks, war etc.

Some disasters can result from combination of both Natural and Man-made causes. These are called as complex emergencies.

Disaster Management refers to managing disaster response in the country. India has been traditionally vulnerable to the natural disasters on the account of its unique geo-climatic conditions. About 60% of the landmass is prone to earthquakes of various intensities; over 40 million hectares is prone to floods; about 8% of the total area is prone to cyclones and 69% of the area is susceptible to drought.

Table: The four phases of disaster management

Mitigation: Preventing future emergencies or minimizing their effects	: Includes any activities that can prevent or reduce the chance of occurrence of an emergency, or reduce the damaging effects of unavoidable emergencies. : Mitigation activities take place before and after emergencies. : This can be done by revised zoning, land use management, etc.
Preparedness: Preparing to handle an emergency	: Includes plans or preparations for disaster and to help response and rescue operations. : Evacuation plans and stocking food and water are both examples of preparedness. : Preparedness activities take place before an emergency occurs.
Response: Responding safely to an emergency	: Includes actions which are to be taken to save lives and prevent further property damage. Response is putting your preparedness plans into action. : Seeking shelter from a tornado or turning off gas valves in an earthquake are both response activities. : Response activities take place during an emergency.
Recovery Recovering from an emergency	: Includes actions need to be taken to return to a normal or an even safer situation following an emergency and one should also consider things which would mitigate the effects of future disasters. : Recovery includes getting financial assistance to help pay for the repairs. : Recovery activities take place after a disaster.

National Disaster Management Authority (NDMA) is an agency of the Ministry of Home Affairs and is responsible for framing policies, laying down guidelines and coordinating with the State Disaster Management Authorities (SDMAs) to ensure a holistic and distributed approach to disaster management. NDMA was established through the Disaster Management Act enacted by the Government of India in May 30, 2005. The Prime Minister is the ex-officio chairperson of it.

FLOODS

Floods occur when land that is usually dry is submerged by large amounts of water. Sudden submergence or inundation of land area with water is called as flood. The occurrence of floods can be due to both natural and human causes.

1. Anthropogenic causes of floods include: Clearing of forests: Lack of vegetation cover to hold the soil together on slopes causes erosion and deposition in river beds making them shallow, flooding occurs when these rivers overflow. Also bare slopes increase surface runoff and volume of water flowing into the rivers.

2. Urban development: The clearing of land for development of residential, commercial and industrial complexes have rapidly increased built-up areas. These concrete pavements and roads prevent infiltration of rainwater into the ground coupled with lack of vegetation cover to intercept the rain water results in increased runoff flowing into the rivers resulting in flooding.

3. Improper farming and other land use practices: The combination of absence of forest cover on one hand, and inappropriate farming and land-use practices on the other have aggravated the flood devastation. There are hardly any forests left in the catchment area of the rivers. It is well known fact that the forest areas are characterized by high infiltration capacity.

4. Enhanced Greenhouse effect: Various human activities resulting in increased greenhouse effect and causing global warming are leading to various climate changes such as higher rainfall in short duration, melting of more ice etc. All these have lead to increased incidences of floods.

Natural causes of floods:

1. Excessive rainfall: Floods occur when rainwater is unable to seep into the ground quickly enough or rivers overflow their banks because river channels cannot contain excess water. It is common in tropical areas.

2. Storm Surges: It occurs when strong winds raise the waves in the ocean to exceptionally high levels, causing them to crash into the coast and flood the land. It is common in coastal areas with low-lying relief.

3. Melting Snow: Melting of snow in spring releases large amount of water into the rivers, causing them to overflow their banks. It is common in places with cool temperate climate.

4. Global Atmospheric processes: Abnormal weather phenomenon such as El Nino (warming of surface ocean waters at Southeastern part of Pacific Ocean).

5. Earthquakes: Earthquakes can bring about landslides or trigger tsunamis. When landslides occur, loosened soil, rocks, mud debris etc. may be deposited in rivers causing overflowing of these rivers.

Tsunamis triggered by strong undersea earthquakes can flood and devastate coastal settlements.

Impact of floods:

1. Loss of life: Floods mostly strike people unprepared, leading to loss of lives in drowning. Along with livestock and other life forms. Impact is higher in flood plain areas which are densly populated,

2. Damage to infrastructure and property: Flood cause huge losses to homes, roads, power supply and other infrastructure.

3. Spread of Diseases: After flood water recedes, shallow stagnant water may cover areas over a considerable period of times. This may result in outbreak of water borne diseases. Moreover homeless flood victims are housed in temporary shelters which are mostly overcrowded and with poor sanitation conditions which may turn situation worse.

4. Loss of natural habitat: Trees, vegetation and other natural habitats may get destroyed leading to loss of biodiversity.

Mitigation of floods

Floods can be mitigated by structural, water control and non-structural measures such as:

- Structural methods include building dams, reservoirs, and retarding basins, channel management and embankments.
- Water control methods: include increasing forest and vegetation cover, watershed management, flood proofing and catchment modifications. Schemes of drainage and flood protection,
- Non-structural methods: flood forecasting, flood warning and emergency preparedness systems, flood insurance, public information and education, and flood relief

Earthquake

An earthquake (also known as a quake, tremor or temblor) is the shaking of the surface of the Earth, with sudden release of energy in the form of seismic waves on the surface of the earth. The point inside the crust where the pressure is released is called the focus. The point on the Earth's surface above the focus is called the epicentre. When earthquake occurs beneath the sea it causes tsunami. The study of earthquakes is called as seismology and the instrument used to measure seismic waves is called as seismometer or seismograph.

The magnitude of earthquake is measured by richter scale and intensity by mercalli scale(Table).

Magnitude	Description	Mercalli intensity	Average earthquake effects
1.0–1.9	Micro	I	Microearthquakes, not felt, or felt rarely.
2.0–2.9	Minor	I to II	Felt slightly by some people. No damage to buildings.
3.0–3.9		III to IV	Often felt by people, but very rarely causes damage.
4.0–4.9	Light	IV to VI	Noticeable shaking of indoor objects and rattling noises. Felt by most people in the affected area. Generally causes none to minimal damage.
5.0–5.9	Moderate	VI to VII	Can cause damage to poorly constructed buildings. None to slight damage to all other buildings. Felt by everyone.
6.0–6.9	Strong	VIII to X	Destructive. Earthquake-resistant structures survive with slight to moderate damage. Poorly designed structures receive moderate to severe damage.
7.0–7.9	Major	X	Causes damage to most buildings, some partially or completely collapse or receive severe damage.
8.0–8.9	Great		Major damage, structures likely to be destroyed. Damage earthquake-resistant buildings. Felt in extremely large regions.
9.0 and greater			At or near total destruction – severe damage or collapse to all buildings. Permanent changes in ground topography.

Causes of earthquake: According to the theory of plate tectonics, Earth is composed of many individual plates that move and interact, constantly changing and reshaping Earth's outer layer. Plates do not always move smoothly against each other and sometimes get stuck. This builds up pressure. When this pressure is eventually released, an earthquake tends to occur. Volcanoes and

earthquakes both result from the movement of tectonic plates. Volcanoes, tides can also trigger seismicity. Underground nuclear testing and dams can also cause seismic waves.

Effects:

1) Soil Liquefaction:- Due to earthquakes granular material (such as sand) temporarily loses its strength and transforms from a solid to a liquid (Soil liquefaction). This causes rigid structures, like buildings and bridges, to tilt or sink into the liquefied deposits.

2) Landslides and avalanche: Earthquakes can produce slope instability leading to landslides and avalanche.

3) Tsunamis: When earthquakes occur under sea it causes tsunami. Most destructive tsunamis are caused by earthquakes of magnitude 7.5 or more.

4) Floods: These are secondary effects of earthquakes, as they may occur if dams are damaged.

5) Fires: Earthquakes can cause fires by damaging electrical power or gas lines.

6) Destabilization: It destabilizes ecological and social structure of nation. Essential services also got disrupted.

7) Loss of life and property: An earthquake may cause injury and loss of life, general property damage and collapse or destabilization of buildings. The aftermath may bring disease, lack of basic necessities, mental consequences such as panic attacks and depression to survivors etc. E.g. Earthquake in 2005 with Epicenter at Muzaffarabad killed 80,000 people and injured around 1,00,000 and 3.5 million people were dislodged.

Management and mitigation methods:

Earthquakes cannot be stopped or predicted accurately but certain management techniques could be followed to minimize its effect:

1) Construction of buildings which can tolerate earthquakes. This can be done by:

a) By keeping weak spots in building to absorb vibrations.

b) To keep pads or floats beneath buildings.

c) Wooden house to be preferred in earthquake prone area.

2) Soil testing should be done so that stability of building is assured.

3) Seismic retrofitting is the modification of existing structures to make them more resistant to seismic activity, ground motion, or soil failure due to earthquakes.

4) Preparedness and safe building construction can reduce extent of damage and loss.

5) Establishment of GPS station in the earthquake prone region to assess future crustal movements.

J&K falls in seismic zones IV (high) and V (very high). So, we need to be more aware about precautionary measures against earthquake

Cyclones

Cyclone refers to any spinning storm that rotates around a low-pressure center. The low-pressure center is also referred to as the 'eye' of the storm. It is accompanied by powerful winds blowing anticlockwise in northern hemisphere and clockwise in southern hemisphere. They are known by different names in different countries. Typhoons in northwest pacific ocean, hurricanes in north Atlantic ocean and northeast and south pacific ocean, Tropical cyclones in southwest pacific ocean, southeast and southwest Indian ocean. Willy Willy in Australia Baguio in China Sea, Taifu in Japan and Tornado in South America.

Formation of cyclone

When warm (above 26 °C), moist air over the ocean rises upward, it causes an area of low air pressure below. Air from surrounding areas with higher air pressure pushes in to the low pressure area. Then this new cool air becomes warm and moist and rises too and this cycle continues. As the warm, moist air rises and cools the water in the air forming clouds. The Coriolis effect made by the Earth's rotation causes the winds to rotate. As the storm system rotates faster and faster, an eye forms in the center. It has little rain or wind. The eye wall maximum rain and the strongest winds. When the winds in the rotating storm reach 39 mph, the storm is called a tropical storm. And when the wind speeds reach 74 mph, the storm is officially a tropical cyclone, hurricane, typhoon or cyclone based on the storm location Tropical cyclones usually weaken when they hit land, because they are no longer being fed by the energy from the warm ocean waters.

However, they travel far inland, bringing heavy rain and wind before dying out completely. Cyclone may last from days to week.

Indian cyclones: The 7517 km long coastline of India is world most cyclone affected stretch. Around 8% of the total land area in India is prone to cyclones. West Bengal, Odisha, Gujarat, Andhra Pradesh, Karnataka, Goa and Kerala are the most cyclone affected states of India. E.g. Cyclone Phailin originated in Vietnam in October 2013. This cyclone affected Odisha, Jharkhand, West Bengal, Chhattisgarh, Bihar and eastern parts of Uttar Pradesh. A total of 1,34,426 people were eventually evacuated. Power and communication lines went down across many districts. Besides economic losses Odisha recorded casualties of 44 people.

Effects:

Cyclones bring destruction to life and property. It is characterized by heavy rains and strong winds.

1) Storm surge: It is an abnormal rise of sea level near the coast caused by a severe tropical cyclone resulting in inundation of low lying areas of coastal regions. It drowns human beings and live-stock, erodes beaches and embankments, destroys vegetation and reduces soil fertility.

2) Floods: Heavy and continued rains due to cyclones may cause floods and submergence of low lying areas resulting in loss of life and property. Floods and coastal inundation pollute drinking water sources causing eruption of epidemics.

3) Strong winds: Very strong winds may damage infrastructure, dwellings, communication systems, trees etc. vandalizing life and property. It affects normal functioning of life.

4) Crop: It damages crops, which could lead to inflation.

5) Decline in tourist: Tourist will not come to a cyclone affected area, thereby affecting livelihood of people.

6) Storm churn: By churning up cold water, tropical cyclones tend to leave a cold wake behind them that can depress ocean temperature and thus, stifling trailing storm.

7) Psychological impact: Disaster of any kind has long lasting fear on minds of masses. They have witness large number of deaths, collapse of infrastructure, cries, pains and many sorrows.

Management and Mitigation of Cyclones

1) Coastal plantation: Forests act as buffer zone against cyclones. Cyclones travel unchecked in absence of forest. The degraded forests land must be planted as plantation will act as green wall/wind break for cyclones and water flow reduction in storm surges. Mangrove forests shall be managed.

2) Effective weather Monitoring: Cyclones can be predicted several days' before. So, effective weather monitoring and forecast can help in minimizing the losses due to cyclones. Warning messages should be simple and reach in time to the masses.

3) Land Use control: Land use should be such that minimum critical activities carried out in vulnerable areas. Buildings should be water and wind resistant. Retrofitting of the older buildings should be mandatory. There should be maintenance of river embankments.

Communication lines should be drawn underground. Construction of strong halls in vulnerable areas.

4) Coastal Regulation Zone norms: They should be strictly enforced.

5) Insurance cover: Comprehensive state insurance cover needs to be provided for persons, their properties and cattle.

6) Preparedness: Coastal areas should have adequate preparedness against cyclones. Wide roads for quick evacuation, disaster resilient buildings, shelter houses etc.

7) Awareness: Focused awareness activities are required to increase public awareness of storm surge, flooding and rainfall related to cyclone

Tsunami

The term Tsunami has been derived from a Japanese term Tsu meaning 'harbor' and nami meaning 'waves'. Tsunamis are popularly called tidal waves but they actually have nothing to do with the tides. These waves which often affect distant shores, originate by rapid displacement of water from the lake or the sea either by seismic activity, landslides, volcanic eruptions or large meteoroid impacts.

Whatever the cause may be sea water is displaced with a violent motion and swells up, ultimately surging over land with great destructive power. The effects of a tsunami can be unnoticeable or even destructive.

Causes of a Tsunami

The geological movements that cause tsunamis are produced in three major ways. The most common of these are fault movements on the sea floor, **accompanied by an earth-quake.** They release huge amount of energy and have the capacity to cross oceans. The degree of movement depends on how fast the earthquake occurs and how much water is displaced.

On December 26, 2004 the massive Indian Ocean tsunami occurred on this day, a 100-foot high tsunami triggered by an earthquake of magnitude 9.1, one of the largest ever recorded, from under the Indian Ocean killed more than 230,000 people in South Asia. With the epicenter near Sumatra, Indonesia, the earthquake triggered a tsunami that hit Thailand, Sri Lanka, India, and Indonesia.

A tsunami researcher and forecaster with the National Oceanic and Atmospheric Administration Center for Tsunami Research, Vasily Titov cites the destructive capacity of the 2004 tsunami to the earthquake in the megathrust fault, ‘where heavy oceanic plates subduct beneath lighter continental plates’. “They are the largest faults in the world and they’re all underwater,” He added that the tsunami waves could be seen like a large pebble falling in the ocean causing mega ripples.

The Sumatra earthquake and tsunami are considered to be an eye-opener for India as it introduced the Indian coastline to tsunami and its destructible power. Learning from the unprecedented natural disaster that led to such heavy damage to life and property, the Ministry of Earth founded the Indian Tsunami Early Warning System (ITEWS) at Indian National Centre for Ocean Information Services (INCOIS), Hyderabad in October 2007.

Scientists in India are now able to predict and project movements in Indian ocean through real-time seismic monitoring with Bottom Pressure Recorders (BPR), tide gauges and 24x7 operational tsunami warning system to detect tsunamigenic earthquakes as to provide early advisories to the most vulnerable.

The second most common cause of the tsunami is a landslide either occurring under water or originating above the sea and then plunging into the water. The largest tsunami ever produced by a landslide was in Lituya Bay, Alaska 1958. The massive rock slide produced a wave that reached a high water mark of 50 - 150 meters above the shoreline.

The third major cause of tsunami is volcanic activity. The flank of a volcano located near the shore or under water may be uplifted or depressed similar to the action of a fault, or, the volcano may actually explode. In 1883, the violent explosion of the famous volcano, Krakotoa in Indonesia,

produced tsunami measuring 40 meters which crushed upon Java and Sumatra. Over 36,000 people lost their lives in this tyrant waves.

General Characteristics:

Tsunami differs from ordinary ocean waves, which are produced by wind blowing over water. The tsunamis travel much faster than ordinary waves. Compared to normal wave speed of 100 kilometers per hour, tsunami in the deep water of the ocean may travel the speed of a jet airplane - 800 kilometers per hour! And yet, in spite of their speed, tsunami increases the water height only 30-45cm and often passes unnoticed by ships at sea.

Contrary to the popular belief, the tsunami is not a single giant wave. It is possible for a tsunami to consist of ten or more waves which is then termed as 'tsunami wave train'.

The waves follow each other 5 to 90 minutes apart. Tsunami normally causes flooding as a huge wall of water enters the main land.

Predictability:

There are two distinct types of tsunami warning:

a) International tsunami warning systems and

b) Regional warning systems.

Tsunamis have occurred in all the oceans and in the Mediterranean Sea, but the great majority of them have occurred in the Pacific Ocean. Since scientists cannot exactly predict earthquakes, they also cannot exactly predict when a tsunami will be generated.

a) International Tsunami Warning Systems: Shortly after the Hilo Tsunami (1946), the Pacific Tsunami Warning System (PTWS) was developed with its operational center at the Pacific Tsunami Warning Center (PTWC) near Honolulu, Hawaii. The PTWC is able to alert countries several hours before the tsunami strikes. The warning includes predicted arrival time at selected coastal communities where the tsunami could travel in few hours.

A tsunami watch is issued with subsequent arrival time to other geographic areas.

b) Regional Warning Systems usually use seismic data about nearby earthquakes to determine if there is a possible local threat of a tsunami. Such systems are capable enough to provide warnings to the general public in less than 15 minutes.

In 1995 the US National Oceanic and Atmospheric Administration (NOAA) began developing the Deep Ocean Assessment and Reporting of Tsunami (DART) system. By 2001 six stations had been deployed in the Pacific Ocean. Each station consists of a sea bed bottom pressure recorder (at a depth of about 6000 m) which detects the passage of a tsunami and transmits the data to a surface buoy. The surface buoy then radios the information to the PTWC. In India, the Survey of India maintains a tide gauge network along the coast of India.

The gauges are located in major ports .The day-to-day maintenance of the gauge is carried with the assistance from authorities of the ports.

Apart from the tide gauge, tsunami can be detected with the help of radars. The 2004 Indian Ocean tsunami, recorded data from four radars and recorded the height of tsunami waves two hours after the earthquake. It should be noted that the satellites observations of the Indian Ocean tsunami would not have been of any use in delivering warnings, as the data took five hours to process and it was pure chance that the satellites were overhead at that time.

However, in future it is possible that the space-based observation might play a direct role in tsunami warning.

Typical adverse effects:

Local tsunami events or those less than 30 minutes from the source cause the majority of damage. The force of the water can raze everything in its path. It is normally the flooding affect of the tsunami that causes major destruction to the human settlements, roads and infrastructure thereby disrupting the normal functioning of the society.

Withdrawal of the tsunami causes major damage. As the waves withdraw towards the ocean they sweep out the foundations of the buildings, the beaches get destroyed and the houses carried out to sea. Damage to ports and airports may prevent importation of needed food and medical supplies. Apart from the physical damage, there is a huge impact on the public health system. Deaths mainly occur because of drowning as water inundates homes. Many people get washed away or crushed by the giant waves and some are crushed by the debris, causes.

There are very few evidences which show that tsunami flooding has caused large scale health problem.

Availability of drinking water has always been a major problem in areas affected by a disaster. Sewage pipes may be damaged causing major sewage disposal problems.

Open wells and other ground water may be contaminated by salt water and debris and sewage. Flooding in the locality may lead to crop loss, loss of livelihood like boats and nets, environmental degradation etc

Possible risk reduction measures:

While it is of course not possible to prevent a tsunami, in certain tsunami prone countries some measures have been taken to reduce the damage caused on shore.

Japan has implemented an extensive programme of building tsunami walls of up to 4.5m (13.5 ft) high in front of populated coastal areas. Other localities have builtflood gates and channels to redirect the water from incoming tsunamis. However, framed structures in the area. The wall may have succeeded in slowing down and moderating the height of the tsunami but it did not prevent major destruction and loss of life.

Some other systematic measures to protect coastlines against tsunamis include:

Site Planning and Land Management

Within the broader framework of a comprehensive plan, site planning determines the location, configuration, and density of development on particular sites and is, therefore, an important tool in reducing tsunami risk.

The designation and zoning of tsunami hazard areas for such open-space uses as agriculture, parks and recreation, or natural hazard areas is recommended as the first land use planning strategy. This strategy is designed to keep development at a minimum in hazard areas.

- In areas where it is not feasible to restrict land to open-space uses, other land use planning measures can be used. These include strategically controlling the type of development and uses allowed in hazard areas, and avoiding high-value and high occupancy uses to the greatest degree possible.

Engineering structures – Most of the habitation of the fishing community is seen in the coastal areas. The houses constructed by them are mainly of lightweight materials without any engineering inputs. Therefore there is an urgent need to educate the community about the good construction practices that they should adopt such as:

Site selection – Avoid building or living in buildings within several hundred feet of the coastline as these areas are more likely to experience damage from tsunamis.

• Construct the structure on a higher ground level with respect to mean sea level.

Elevate coastal homes: Most tsunami waves are less than 3 meters in height. Elevating house will help reduce damage to property from most tsunamis.

• Construction of water breakers to reduce the velocity of waves.

• Use of water and corrosion resistant materials for construction.

• Construction of community halls at higher locations, which can act as shelters at the time of a disaster

Cloudburst

A cloudburst is extreme rainfall, sometimes mixed with hail and thunder, which normally no longer than a few minutes but is capable of creating minor flood conditions.

Cloudbursts descend from very high clouds, sometimes with tops above 15 kilometers. The monsoon rains during July and August put a lot of water into the Himalayan soil; when there are instances of cloudbursts, the results can be disastrous. In the Indian subcontinent, a cloudburst usually occurs when a monsoon cloud drifts northwards, from the Bay of Bengal or Arabian sea across the plains, then onto the Himalaya and bursts, bringing rainfall as high as 75 millimeters per hour. An example was the sudden cloud burst over the Indian city of Mumbai and other regions of western India, which occurred on the 26th of July, 2005.

Approximately 950mm of rainfall was recorded in Mumbai over a span of eight to ten hours; the flood completely filled India's largest city and financial centre. Many time cloudburst had observed in Kullu Manali and Shimla (Himachal Pradesh) within a short span of time during July-Aug 2003. Uttarachal also experienced cloudburst during 2003.

Cloud burst is actually a situation when the inter-molecular forces between the H2O molecules get very high due to the rapid decrease in the temperature or excess of electrostatic induction in the clouds causing the lightning to remain inside the cloud only, which causes hyperactive energy inside the cloud. The water molecules get denser and denser and get condensed but do not leave the cloud due to excess of electro forces.

As the water concentration get higher and higher and so the weight gets heavier the water no longer is able to maintain force with the clouds and so they fall and it precipitates.

A cloudburst can suddenly dump 25,000 tonnes per square kilometer (71,000 short ton/sq mi). This is quite a wallop and luckily it does not happen very often. A real cloudburst is very rare. Sometimes we call a sharp shower in the mountains a cloudburst when it really is not. The runoff from the slopes creates such a deluge that is seems that a cloud has burst open like a paper bag.

Of course, even in a real cloudburst, the cloud does not break open. It happens because the rain forming in the cloud has been unable to fall down in a steady shower. Sometimes this happens when the cloud is ready to rain and the ground below is scorching hot. Either of these events causes a strong updraft of warm air. Raindrops find it very hard to fall through a current of rising air. When they start down, up they are whisked again, if this goes on for any length of time, the cloud gets an overload of rain. The drops that should have fallen are returned up and new drops are being: formed all the time. Finally something happens to change the situation. The weight of rain is able to break through or maybe the updraft suddenly stops for some reason. Then all the raindrops, new ones and old, come tumbling down at once. Truly it seems as if the rain clouds burst.

Avalanche:

An avalanche (also called a snowslide or snowslip) is a rapid flow of snow down a sloping surface. Avalanches are typically triggered in a starting zone from a mechanical failure in the snowpack (slab avalanche) when the forces on the snow exceed its strength but sometimes only with gradually widening (loose snow avalanche). After initiation, avalanches usually accelerate rapidly and grow in mass and volume as they entrain more snow. If the avalanche moves fast enough some of the snow may mix with the air forming a powder snow avalanche, which is a type of gravity current.

Slides of rocks or debris, behaving in a similar way to snow, are also referred to as avalanches. The load on the snowpack may be only due to gravity, in which case failure may result either from weakening in the snowpack or increased load due to precipitation. Avalanches that occur in this way are known as spontaneous avalanches. Avalanches can also be triggered by other loads such as skiers, snowmobilers, animals or explosives. Seismic activity may also trigger the failure in the

snowpack and avalanches. A popular myth is that avalanches can be triggered by loud noise or shouting, but the pressure from sound is orders of magnitude too small to trigger an avalanche.

Although primarily composed of flowing snow and air, large avalanches have the capability to entrain ice, rocks, trees, and other material on the slope, and are distinct from mudslides, rock slides, and serac (A serac is a large chunk of glacial ice which can be as big as a house in some cases) collapses on an icefall. Avalanches are not rare or random events and are endemic to any mountain range that accumulates a standing snowpack. Avalanches are most common during winter or spring but glacier movements may cause ice and snow avalanches at any time of year. In mountainous terrain, avalanches are among the most serious objective natural hazards to life and property, with their destructive capability resulting from their potential to carry enormous masses of snow at high speeds.

There is no universally accepted classification of avalanches—different classifications are useful for different purposes. Avalanches can be described by their size, their destructive potential, their initiation mechanism, their composition and their dynamics.

In India landslides occur in Himalayas and Ghat regions. The Himalayan ranges are considered to be the world's youngest fold mountain ranges, which are geologically very active due to active continent-continent collision of Indian and Eurasian plates and most vulnerable to landslides and earthquakes. The Eastern and Western Ghats regions also experience several landslides every rainy season. Devastating landsides caused by exceptionally heavy rainfall. Earthquakes are known to have triggered a number of landslides.

Causes of Avalanche:

Most avalanches occur spontaneously during storms under increased load due to snowfall. The second largest cause of natural avalanches is metamorphic changes in the snowpack such as melting due to solar radiation. Other natural causes include rain, earthquakes, rockfall and icefall. Artificial triggers of avalanches include skiers, snowmobiles, and controlled explosive work.

Avalanche initiation can start at a point with only a small amount of snow moving initially; this is typical of wet snow avalanches or avalanches in dry unconsolidated snow. However, if the snow has sintered into a stiff slab overlying a weak layer then fractures can propagate very rapidly, so that a large volume of snow, that may be thousands of cubic meters, can start moving almost simultaneously.

A snowpack will fail when the load exceeds the strength. The load is straightforward; it is the weight of the snow. However, the strength of the snowpack is much more difficult to determine and is extremely heterogeneous.

It varies in detail with properties of the snow grains, size, density, morphology, temperature, water content; and the properties of the bonds between the grains. These properties may all metamorphose in time according to the local humidity, water vapour flux, temperature and heat flux. The top of the snowpack is also extensively influenced by incoming radiation and the local air flow. One of the aims of avalanche research is to develop and validate computer models that can describe the evolution of the seasonal snowpack over time. A complicating factor is the

complex interaction of terrain and weather, which causes significant spatial and temporal variability of the depths, crystal forms, and layering of the seasonal snowpack.

Consequences of Avalanche:

In considering the effects and impacts of landslides and snow avalanches, the following special features of these hazards should be kept in mind:

(a) These disasters occur in remote mountain areas with difficult terrain and adverse weather conditions.

(b) The communities (villages and hamlets) are small entities with weak housing, makeshift structures and poor resources.

(c) Landslides and snow avalanches give almost no notice in most cases and enormous amount of rock, soil or snow come crashing with fantastic speed on the often-unprepared communities.

In the light of the above three considerations, the effects and impacts of landslides and snow avalanches may be divided into:

i) Direct effects-physical damage:

Anything in the top of a landslide or in its path or at its bottom will suffer severe damage. The same is the case with a snow avalanche when anything in its path or falling areas will suffer severe damage. In case of a snow avalanche of "slab type" where massive slabs of hardened snow come hurtling down, the hit is very hard and devastating where as the "loose snow' type of snow avalanche may engulf and cover larger area. Blockages of roads, mountain passes and streams and damage to electric and communication lines are among the direct effects of landslides and snow avalanches apart from injuries and fatalities to human and cattle lives. Blockage of streams and later release of the impounded water create flash floods with disastrous effects. Falling of large volumes of debris from landslides or snow avalanches in mountain lakes can generate flash floods. Snow avalanches create additional suffering due to extremely low temperatures and the associated freezing effect. Even if there are survivors among the victims, they may suffer hypothermia and frost-bite before help arrives.

ii) Indirect Effects and long –term Impacts:

Apart from loss of houses, destruction of property and shattering of family life due to death or injury to kith and kin, the indirect effects and long-term impacts of landslides and snow avalanches lead to further loss of productivity (agriculture, poultry, small scale cottage industry, forest produce) in an already marginal productivity scenario.

Forest Fire

An uncontrolled forest fire can devastate everything in its path, spread for miles, crossing rivers and roads. Each year, between 60,000 and 80,000 forest fires occur, destroying between 3 and 10 million hectares. While forest fires have different impacts on the environment, depending on their size and frequency, the causes are also diverse.

Causes increasingly linked to human activities

A few hundred years ago, forest fires were a natural "activity" caused mostly by rare phenomena, such as a volcanic eruption or an earthquake, that occur in very specific geographical areas. Therefore, it is not them, but lightning, that is the main cause of the departure of forest fires from natural sources. For example, it accounts for about 2% of fires in the Mediterranean zone… and close to 30% in Quebec ! In Spain, 5% of fires are due to natural causes, especially in dry, hot places. In some parts of the country (Aragon, Pyrenean chains, etc.), thunderstorms and lightning, in the absence of rain, are responsible for 25% of forest fire departures. Other exceptional circumstances and very unusual phenomena, such as the collision of two silicious rocks producing a spark, may also have a (minimal) impact on fires. Fires of natural origin are often quickly channeled since they usually have only one outbreak.

But today, natural causes are much less frequent and now give place to human activities, whether voluntary or not :

43% of forest fires caused by humans are linked to imprudences (cigarette butts, garbage deposits, burning). They can also occur as a result of surges, damage to power lines or military accidents as happened in 2016 and 2017 at Captieux military camp in Gironde (caused by military fire, destroying 1300 hectares of pines) or at Le Mans military camp in April 2017. Finally, recklessness is often linked to recreational activities, agricultural or forestry work (55% of fires)

25% of forest fires caused by humans are caused by pyromaniacs, revenge or political or administrative strategy.

The remainder being classified of unknown origin… Thus, since 1973, more than 1.1 million hectares burned in France.

Fauna and flora upset by forest fires

When the frequency of forest fires in a given area is high, the consequences can be devastating. If some specialists consider fire to be a windfall for the ecosystem (elimination of diseased plants and plants, increased plant and animal diversity, etc.), we must not forget that the natural cycles of forests are disturbed and that some species disappear, while invasive plants proliferate. Forest fires increase carbon dioxide levels in the atmosphere, contributing to the greenhouse effect and climate change. In addition, ashes destroy much of the nutrients and erode the soil, causing flooding and landslides.

The use of chemicals in firefighting adds an additional problem to the already dramatic consequences of forest fires. According to a recent study by the Supreme Council for Scientific Research (CSIC), chemicals contained in “flame retardants” used to extinguish fires (such as Fire-Trol) accumulate in the soil for years. The findings of the study highlight the presence of ammonium polyphosphate, known to alter soil fertility, biodiversity and affect the composition of vegetation.

The forests of Uttarakhand have not stopped burning in the last six months. Fires have continued to erupt one after another.

While forest fires are a recurring and common phenomena, their frequency has been on the rise in the state.

The season between winter and monsoon, referred to as the ‘forest fire season’, is now increasing. Climate change and consequently scarce rainfall in the Himalayan regions plays a huge role.

There were 989 fire incidents in the forests of the state from October 1,2020-April 4, 2021, according to forest department figures. Some 1,297.43 hectares of forest got burned down in the fires, according to the estimates.

There were 470 incidents of fire in Uttarakhand’s forests between November 2020 and January 2021. The figure for the same period in the previous year was 39.

Uttarkhand ranked second in the country after Madhya Pradesh in terms of active instances of fire on April 5, 2021 according to the Forest Survey of India. There were 93 active instances of fire in Madhya Pradesh and 71 in Uttarakhand.

Uttarkhand received only 10.9 millimetres of rainfall from January-March 2021 against the usual 54.9 mm, a deficit of nearly 80 per cent. The district of Pauri, which has been most affected by fires, received the least amount of rain, a measly 3.1 mm, against the usual 36.6 mm. The deficit in Pauri has been 92 per cent.

Temperatures too have been rising across Uttarakhand and other Himalayan states. The year 2020 was the second consecutive ‘warm’ year for the state.

“In broad terms, the increase in forest fires can be attributed to the rise in temperatures across North India,” Raman Sukumar, honourary professor at the Centre for Ecological Studies, Indian Institute of Science, Bengaluru, told Down To Earth.

“Warmer weather leads to rapid desiccation of fuel (wood, leaves and other inflammable materials found in forests). In such a scenario, even a small ignition is likely to become widespread,” he said.

Temperatures in the first three months of the year have been warmer than usual. March 2021 was the third warmest in 121 years, the India Meteorological Department had said in its review for the month. “The basis for more fires in April was laid in March itself,” Sukumar added.

A majority of the forest fire alerts were concentrated in north and central India, the GFW data showed, mainly in the states of Maharashtra, Madhya Pradesh, Odisha and Uttarakhand, along with parts of Jharkhand and Telangana.

State-wise, Uttarakhand reported a significant jump in alerts. The Himalayan state recorded 8,934 forest fire alerts during April 1-14 as against 72 in the corresponding fortnight last year. Uttarakhand's forest department had said earlier this month that fires that began in October 15, 2020 were still burning on April 5, 2021, as a result of rising temperatures and poor rainfall.

Madhya Pradesh saw the highest number of VIIRS alerts (22,797) during the fortnight, in line with the trend of the past five years. But this is also double the 11,609 alerts that the state recorded in April 1-14, 2020. Jharkhand (5,284 VIIRS alerts this month) and Odisha (5,000 alerts) have also seen a significant rise in the number of VIIRS alerts.

VIIRS (Visible Infrared Imaging Radiometer Suite (VIIRS) alert) is a weather monitoring equipment placed in satellites orbiting the earth. It is basically a sensor, that was designed and manufactured by Raytheon company. ... VIIRS is placed in Suomi National Polar orbiting Partnership (Suomi NPP) and NOAA-20 weather satellites

Nuclear and Radiological Emergency/Disaster

Nuclear Disaster

A nuclear and radiation accident is defined by the International Atomic Energy Agency as "an event that has led to significant consequences to people, the environment or the facility. Examples include lethal effects to individuals, large radioactivity release to the environment, or reactor core melt."The prime example of a "major nuclear accident" is one in which a reactor core is damaged and significant amounts of radiation are released, such as in the Chernobyl Disaster in 1986. The impact of nuclear accidents has been a topic of debate practically since the first nuclear reactors were constructed. It has also been a key factor in public concern about nuclear facilities.Some technical measures to reduce the risk of accidents or to minimize the amount of radioactivity released to the environment have been adopted. Despite the use of such measures, "there have been many accidents with varying impacts as well near misses and incidents".

Impact

Benjamin K. Sovacool has reported that worldwide there have been 99 accidents at nuclear power plants. Fifty-seven accidents have occurred since the Chernobyl disaster, and 57% (56 out of 99) of all nuclear-related accidents have occurred in the USA.Serious nuclear power plant accidents include the Fukushima Daiichi nuclear disaster (2011), Chernobyl disaster (1986), Three Mile Island accident (1979), and the SL-1 accident (1961).Stuart Arm states, "apart from Chernobyl, no nuclear workers or members of the public have ever died as a result of exposure to radiation due to a commercial nuclear reactor incident."Nuclear-powered submarine mishaps include the K-19 reactor accident (1961),the K-27 reactor accident (1968),and the K-431 reactor accident (1985).Serious radiation accidents include the Kyshtym disaster,Windscale fire, radiotherapy

accident in Costa Rica,radiotherapy accident in Zaragoza,radiation accident in Morocco,Goiania accident,radiation accident in Mexico City, radiotherapy unit accident in Thailand,and the Mayapuri radiological accident in India.

Nuclear power plant accidents

One of the worst nuclear accidents to date was the Chernobyl disaster which occurred in 1986 in Ukraine. That accident killed 30 people directly, as well as damaging approximately $7 billion of property. A study published in 2005 estimates that there will eventually be up to 4,000 additional cancer deaths related to the accident among those exposed to significant radiation levels.Radioactive fallout from the accident was concentrated in areas of Belarus, Ukraine and Russia. Approximately 350,000 people were forcibly resettled away from these areas soon after the accident. Benjamin K. Sovacool has reported that worldwide there have been 99 accidents at nuclear power plants from 1952 to 2009 (defined as incidents that either resulted in the loss of human life or more than US$50,000 of property damage, the amount the US federal government uses to define major energy accidents that must be reported), totaling US$20.5 billion in property damages.Fifty-seven accidents have occurred since the Chernobyl disaster, and almost two-thirds (56 out of 99) of all nuclear-related accidents have occurred in the USA. There have been comparatively few fatalities associated with nuclear power plant accidents. Nuclear reactors become preferred targets during military conflict and, over the past three decades, have been repeatedly attacked during military air strikes, occupations, invasions and campaigns.

Nuclear Safety

Nuclear safety covers the actions taken to prevent nuclear and radiation accidents or to limit their consequences. This covers nuclear power plants as well as all other nuclear facilities, the transportation of nuclear materials, and the use and storage of nuclear materials for medical, power, industry, and military uses. The nuclear power industry has improved the safety and performance of reactors, and has proposed new safer (but generally untested) reactor designs but there is no guarantee that the reactors will be designed, built and operated correctly.Mistakes do occur and the designers of reactors at Fukushima in Japan did not anticipate that a tsunami generated by an earthquake would disable the backup systems that were supposed to stabilize the reactor after the earthquake. According to UBS AG, the Fukushima nuclear accidents have cast doubt on whether even an advanced economy like Japan can master nuclear safety. Catastrophic scenarios involving terrorist attacks are also conceivable. An interdisciplinary team from MIT have estimated that given the expected growth of nuclear power from 2005 – 2055, at least four serious nuclear accidents would be expected in that period.To date, there have been five serious accidents (core damage) in the world since 1970 (one at Three Mile Island in 1979; one at Chernobyl in 1986; and three at Fukushima-Daiichi in 2011), corresponding to the beginning of the operation of generation II reactors. This leads to on average one serious accident happening every eight years worldwide.Nuclear weapon safety, as well as the safety of military research involving nuclear materials, is generally handled by agencies different from those that oversee civilian safety, for

various reasons, including secrecy. There are ongoing concerns about terrorist groups acquiring nuclear bomb-making material.

Top 5 Nuclear Disasters

5. Three Mile Island Nuclear Accident

Pennsylvania, USA 1979 (INES Level 5)

The Three Mile Island Unit 2 (TMI-2) reactor, near Middletown, Pennsylvania, suffered a partial melt down on March 28, 1979. The most serious accident in U.S. nuclear power plant history was caused by a relief valve failure, after an unplanned shutdown, causing severe damage to the core. Better instrumentation, training programs and public information would have vastly improved matters but luckily there were no injuries or discernible health impacts.

4. Windscale Fire Nuclear Disaster

Sellafield, UK 1957 (INES Level 5)

On 10 October 1957 a raging inferno swept through the core of Unit 1 nuclear reactor at Windscale, Cumberland (now Sellafield, Cumbria) for three days. The Level 5 accident dumped radioactive contamination across Europe and it is thought that traces of isotope iodine-131 may have caused several hundred cancer diagnoses. Windscale's two piles had been hastily built during the British atomic bomb project. It was the UK's worst ever nuclear accident.

3. Kyshtym Nuclear Disaster

Russia 1957 (INES Level 6)

The third most serious nuclear accident in history happened at the secretive Mayak plant, near the Russian town of Kyshtym – part of the Soviet Union's attempt to match the US for weapons-grade plutonium production. After a faulty cooling system was left to disrepair, rising temperatures resulted in an explosion with the equivalent force of 70-100 tons of TNT. Nuclear fallout reached more than 300 kilometres away and, due to the classified nature of the plant, it was only a week later that 10,000 locals were evacuated from the area.

2. Fukushima Nuclear Disaster

Japan 2011 (INES Level 7)

On Friday 11 March 2011 the Great East Japan Earthquake, which measured 9.0 on the Richter scale, caused a 15-metre tsunami that disabled the power supply and prompted three reactor meltdowns at the Fukushima Daiichi plant. Official figures suggest that more than 1,000 deaths occurred as a result of an evacuation process that displaced more than 100,000 people. Subsequent investigations have suggested that the infrastructure and risk forecasting were inadequate for such a devastating natural disaster. It was only the second accident in history to receive the most severe Level 7 rating.

1. Chernobyl Nuclear Disaster

Ukraine 1986 (INES Level 7)

The Chernobyl disaster is the worst nuclear power plant accident ever in terms of death toll and cost. The only other Level 7 accident happened on 26 April 1986 when a steam explosion destroyed reactor number four at the Ukrainian plant. Resulting fires spread huge amounts of radioactive waste across Western Europe, killing around 30 people from acute radiation poisoning in the immediate aftermath and raising longterm fears of increased instances of thyroid cancer. The World Nuclear Association says...

“The nuclear disaster was the product of a flawed Soviet reactor design coupled with serious mistakes made by the plant operators.”

Industrial and Chemical Disasters

Disasters that are caused by the excessive use and misuse of chemicals in industries are called chemical disasters. The irresponsible handling of powerful chemicals can cause widespread devastation. re caused by Industrial disasters include events that occur due to mishaps or failures in industry or related activities and also the disasters that affect the industrial functions, property and productivity.

A chemical disaster may occur due to both, natural or human-made sources. Chemical disasters are occurrence of emission, fire or explosion involving one or more hazardous chemicals in the course of industrial activity (handling), storage or transportation. "chemical accident" means an accident involving a fortuitous, or sudden or unintended occurrence while handling any hazardous chemicals resulting in continuous, intermittent or repeated exposure to death, or injury to, any person or damage to any property but does not include an accident by reason only of war or radio-activity;

"major chemical accident" means, - an occurrence including any particular major emission, fire or explosion involving one or more hazardous chemicals and resulting from uncontrolled

developments in the course of industrial activity or transportation or due to natural events leading to serious effects both immediate or delayed, inside or outside the installation likely to cause substantial loss of life and property including adverse effects on the environment;

"Major Accident Hazards (MAH) Installations" - means, isolated storage and industrial activity at a site, handling (including transport through carrier or pipeline) of hazardous chemicals equal to or, in excess of the threshold quantities specified in column 3 of Schedule 2 and 3 respectively of MS and IHC rules 1989.

Sources of Chemical Disasters

Chemical accidents may originate in:

1 Manufacturing and formulation installations including during commissioning and process operations; maintenance and disposal.

2 Material handling and storage in manufacturing facilities, and isolated storages; warehouses and godowns including tank farms in ports and docks and fuel depots.

3 Transportation (road, rail, air, water, and pipelines).

Initiators of Chemical Accidents

A number of factors including human errors could spark off chemical accidents with the potential to become chemical disasters. These are:

1 Process and Safety System Failures:

- Technical errors: design defects, fatigue, metal failure, corrosion etc.
- Human errors: neglecting safety instructions, deviating from specified procedures etc.
- Lack of information: absence of emergency warning procedures, nondisclosure of line of treatment etc.
- Organisational errors: poor emergency planning and coordination, poor communication with public, noncompliance with mock drills/exercises etc., which are required for ensuring a state of quick response and preparedness.

2 Natural Calamities:

The Gujarat state is highly prone to natural disasters, which can also trigger chemical disasters. The release of acrylonitrile at Kandla Port, during an earthquake in 2001, is one of the example.

3 Terrorist Attacks/Sabotage:

Vulnerability to chemical disasters is further compounded by likely terrorist and warfare activities, which include sabotage and attack on HAZCHEM installations and transportation vehicles.

Causative Factors Leading to Chemical Disasters

Chemical disasters, in general, may result from:

1 Fire

2 Explosion

3 Toxic release

4 Poisoning

5 Combinations of the above

- Gujarat, being a highly industrialized State is prone to chemical and industrial hazards which are well supported by the fact that 35% of the total Major Accident Hazard (MAH) units of the country are located mostly at Vapi, Hazira, Ankleshwar, Dahej ect.
- A stretch of 400 kilometres from Ahmedabad to Vapi is known as the "Golden Corridor".
- Almost the entire range of chemical process industry exists in Gujarat, including hydrocarbon processing/refining products, petrochemicals-polymers and man-made fibres, fertilizers, health care products, plant protection chemicals, dyes, pigments and intermediates, fine chemicals, surface coating products, salt and salt-based products, ceramics, glass, cement, vegetable oils, fats and detergents.
- Currently, Gujarat has total 36,179 factories registered under the Factories Act. Out of these 25,206 are working as on January, 2011.
- The State has a Chemical Port Terminal at Dahej. Kandla Port Trust imports and handles the major amount of petrochemical products in India. Additionally, two ports in the private sector located at Mundra and Pipavav, handle major petrochemical products.
- Railways, state highways and national highways running through the State carry chemical cargo that originates in or transits through the State.
- Gujarat also has 15 airports at Ahmedabad, Vadodara, Rajkot, Surat an other places which store aviation fuel and other hazardous chemicals and more with more being planned.
- In addition to the manufacturing industries, there is a significant infrastructure handling chemicals such as pipelines, transportation (rail and road), and isolated storages. A cross-country

2300 Km Hazira-Bijapur-Jagdishpur (HBJ) gas pipeline originates from Hazira. A hydrocarbon supply pipeline runs from Kandla to Bhatinda (Punjab).

- Vulnerability is sometimes compounded due to the location of Major Accident Hazard (MAH) industries closer to densely populated areas.

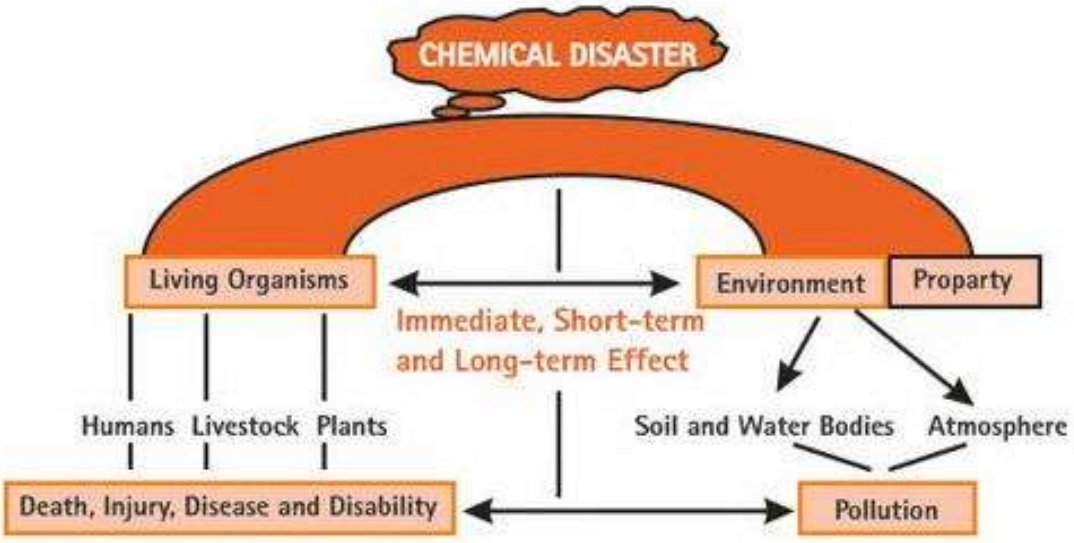
- The Government of Gujarat has categorized districts on the basis of chemical and industrial category as presented in the table;

Chemical and Industrial Hazard		
Sr.No	**Category**	**Districts**
1	AA Category (Highly Hazardous)	Bharuch and Vadodara
2	A Category (Hazardous)	Ahmedabad, Jamnagar, Kachchh, Rajkot, Surat, and Valsad,
3	B Category (Less Hazardous)	Anand, Bhavnagar, Gandhinagar, Kheda, Mehsana, Panchmahals and Porbandar,
4	C Category (Much less Hazardous)	Amreli, Banaskantha, Dahod: Dangs, Junagadh, Narmada, Navsari, Patan, Sabarkantha and Surendranagar.
Source: GSDMA (2001). State Level Response Plan for Chemical, industrial and Nuclear Hazards Gujarat. High Powered Committee (HPC) GoI.		

Types of major chemical/industrial hazards

In addition to loss of life, the major consequences of chemical disasters include impact on livestock, flora/fauna, the environment (air, soil, water) and losses to industry as shown in Figure 1. Chemical accidents may be categorised as a major accident or a disaster depending upon the number of casualties, injuries, damage to the property or environment. A major accident is defined in the Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 1989, issued under the Environment (Protection) Act, 1986, whereas 'disaster' is defined in the DM Act, 2005.

Immediate, Short-term and Long-term Effect



Major industrial hazards are generally associated with the potential for fire, explosion or dispersion of toxic chemicals and usually involve the accidentally release of chemicals from containment. Accidents involving major hazards could include:

Leakage of flammable material, mixing of material with air, formation of flammable vapour cloud to a source of ignition, leading to a fire or an explosion affecting the site and possibly a populated area.

Leakage of toxic material, formation of a toxic vapour cloud and drifting the cloud, affecting directly the site and possibly populated area.

Depending upon the state of released chemical, cause and on its consequences, the major hazards in chemical process industry are classified as:

Fire

Explosion -Toxic release

Global Warming

Global Warming is defined as the increase of the average temperature on Earth. As the Earth is getting hotter, disasters like hurricanes, droughts and floods are getting more frequent.

Over the last 100 years, the average temperature of the air near the Earth´s surface has risen a little less than 1° Celsius (0.74 ± 0.18°C, or 1.3 ± 0.32° Fahrenheit).

It is responsible for the conspicuous increase in storms, floods and raging forest fires we have seen in the last ten years, though, say scientists

Earth should be in cool-down-period But it is not only about how much the Earth is warming, it is also about how fast it is warming. There have always been natural climate changes – Ice Ages and the warm intermediate times between them – but those evolved over periods of 50,000 to 100,000 years.

A temperature rise as fast as the one we have seen over the last 30 years has never happened before, as far as scientists can ascertain. Moreover, normally the Earth should now be in a cool-down-period, according to natural effects like solar cycles and volcano activity, not in a heating-up phase.

The Most Important Things You Can Do about Rapid Climate Change:

1. Understand the Problem

2. Do Something Today to Reduce Greenhouse Gas Emissions

The hard fact is that despite what many nations, companies, cities and people are starting to do to reduce their global warming emissions, the world is putting more CO2 into the air than ever before. The current amount is 385 parts per million (ppm) -- higher than ever in the past 800,000 years.

At the same time, renowned American climatologist Dr. James Hansen of NASA says we already have too much CO2 and other greenhouse gases in the air: "If humanity wishes to preserve a planet similar to that on which civilization developed and to which life on Earth is adapted CO2 will need to be reduced from its current 385 ppm to at most 350 ppm."

What Is the Greenhouse Effect?

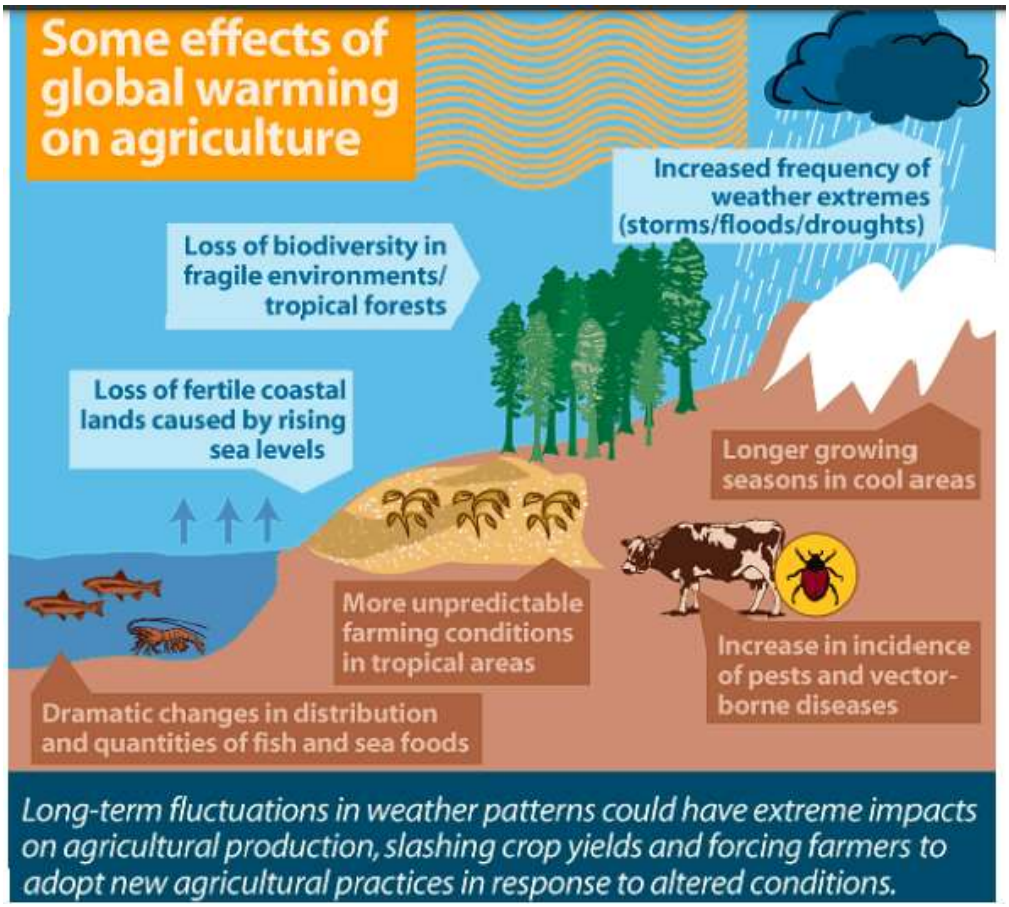
Global warming is perhaps the most important environmental problem in the world today. Levels of greenhouse gases are increasing in the atmosphere due to human activities, and are changing the composition of the atmosphere and global warming.

Climate scientists agree that human activities such as the burning of fossil fuels contribute to the problem.

Scientists have predicted the phenomemon of global warming for decades.

Unfortunately, some of the adverse effects of global warming, they have also predicted begin to occur throughout the world, including:

GLOBAL WARMING AND AGRICULTURE



Pest infestation due to global warming

Direct manifestations of a widespread and long-term trend toward warmer global temperatures

- Heat waves and periods of unusually warm weather
- Ocean warming, sea-level rise and coastal flooding,
- Glaciers melting
- Arctic and Antarctic warming

Events that foreshadow the types of impacts likely to become more frequent and widespread with continued warming.

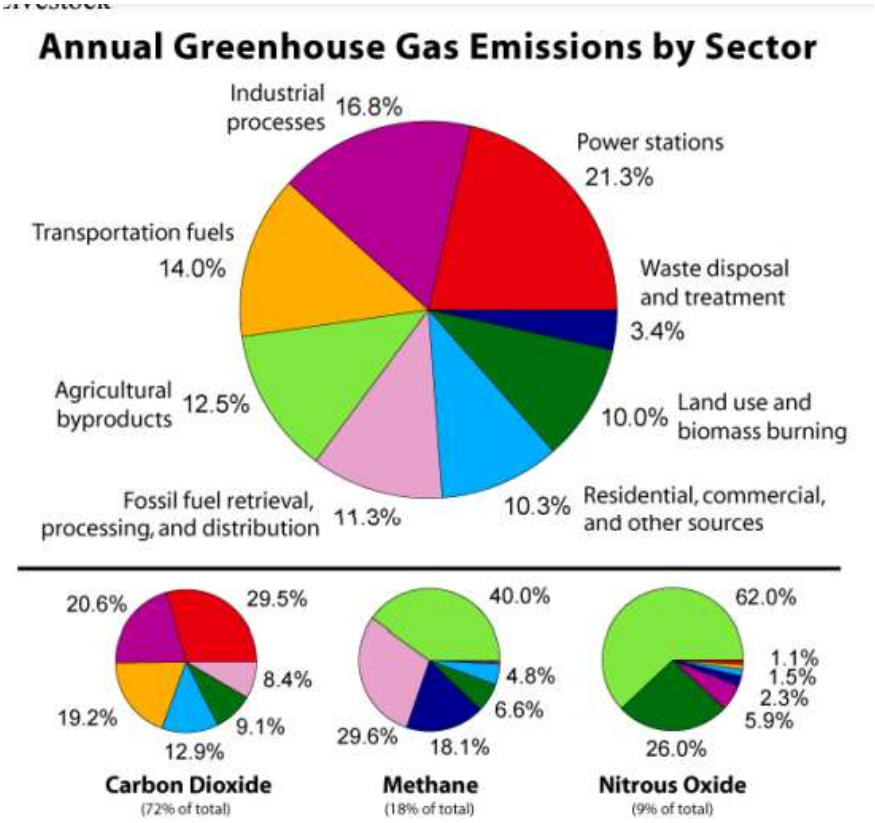
- Spreading disease
- Earlier spring arrival
- Plant and animal range shifts and population changes
- Coral reef bleaching
- Downpours, heavy snowfalls, and flooding
- Droughts and fires

1. Impact of climate change on agriculture

- Shortage in grain production
- Poverty impacts
- Temperature potential effect on growing period
- Potential effect of atmospheric carbon dioxide on yield
- Effect on quality
- Agricultural surfaces and climate changes
- Erosion and fertility
- Potential effects of global climate change on pests, diseases and weeds
- Glacier retreat and disappearance
- Ozone and UV-B
- ENSO effects on agriculture

2. Impact of agriculture on climate change

- Land use
- Livestock



Biological Disasters

Biological disasters are scenarios involving disease, disability or death on a large scale among humans, animals and plants due to toxins or disease caused by live organisms or their products.

Such disasters may be natural in the form of epidemics or pandemics of existing, emerging or reemerging diseases and pestilences or man-made by the intentional use of disease causing agents in Biological Warfare (BW) operations or incidents of Bioterrorism (BT).

Bioterrorism (BT)

The intentional use of microorganisms, or toxins, derived from living organisms, to produce death or disease in humans, animals or plants.

Bioweapon

Biological weapons include any organism or toxin found in nature that can be used to incapacitate, kill, or cause physical or economic harm. Biological weapons are characterised by low visibility, high potency, substantial accessibility and relatively easy delivery methods.

Epidemics

The outbreak of a disease affecting or tending to affect a disproportionately large number of individuals within a population, community, or region at the same time

Pandemics

A pandemic is an epidemic (an outbreak of an infectious disease) that spreads across a large region (for example, a continent), or even worldwide.

Biological disasters might be caused by epidemics, accidental release of virulent microorganism(s) or Bioterrorism (BT) with the use of biological agents such as anthrax, smallpox, etc. The existence of infectious diseases have been known among human communities and civilisations since the dawn of history. The classical literature of nearly all civilisations record the ability of major infections to decimate populations, thwart military campaigns and unsettle nations. Social upheavals caused by epidemics have contributed in shaping history over the ages. The mutual association of war, pestilence and famine was acknowledged and often attributed to divine influences, though a few keen observers realized that some infections were contagious. The development of bacteriology and epidemiology later, established the chain of infection. Along with nuclear and chemical agents, which are derived from technology, biological agents have been accepted as agents of mass destruction capable of generating comparable disasters.

The growth of human society has rested largely on the cultivation of crops and domestication of animals. As crops and animals became necessary to sustain a divergent social structure, the depletion of these resources had far reaching consequences.

Along with the growth of societies, crop and animal diseases acquired more and more importance.

Epidemics can result in heavy mortalities in the short term leading to a depletion of population with a corresponding drop in economic activity, e.g., the plague epidemics in Europe during the middle ages or the Spanish influenza between 1917–18. Infections like Tuberculosis (TB) might

not kill in the short term but thrust nations towards socio-economic disasters. Another example is the Human Immunodeficiency Virus (HIV)/Acquired Immuno Deficiency Syndrome (AIDS) epidemic in Sub-Saharan Africa that has wiped out the benefits of improved health care and decimated the productive segments of society leading to economic stagnation and recession.

Recently, some events experienced in India have highlighted such issues. The outbreak of plague in Surat which was relatively small, disrupted urban activity in the city, generated an exodus and lead to a massive economic fallout.

The ongoing human immunodeficiency virus/ acquired immuno deficiency syndrome epidemic in different parts of the country is leading to the diversion of substantial resources. The spread of the invasive weed Parthenium hysterophorus after its accidental introduction into India has had wide repercussions on human and animal health, apart from depleting the fodder output.

Infectious agents are constantly evolving, often acquiring enhanced virulence or epidemic potential. This results in normally mild infections becoming serious. The outbreak of Chikungunya that started in 2005 is one such example.

In recent times travelling has become easier. More and more people are travelling all over the world which exposes the whole world to epidemics. As our society is in a state of flux, novel pathogens emerge to pose challenges not only at the point of primary contact but in far removed locations. The Marburg virus illustrates this. The increased interaction between humans and animals has increased the possibilities of zoonotic diseases emerging in epidemic form.

Biological Warfare (BW) and Bioterrorism (BT)

The historical association between military action and outbreaks of infections suggest a strategic role for biological agents. The nondiscriminatory nature of biological agents limited their use till specific, protective measures could be devised for the ‘home’ troops. The advances in bacteriology, virology and immunology in the late 19th century and early 20th century enabled nations to develop biological weapons. The relative ease of production, low cost and low level of delivery technology prompted the efforts of many countries after World War (WW) I, which peaked during the cold war. The collective conscience of the world, however, resulted in the Biological and Toxin Weapons Convention which resolved to eliminate these weapons of mass destruction. Despite considerable enthusiasm, the convention has been a non-starter.

While biological warfare does not appear to be a global threat, the use of some agents such as anthrax by terrorist groups pose a serious threat.

The ease of production, packaging and delivery using existing non-military facilities are major factors in threat perception. These artificially induced infections would behave similar to natural infections (albeit exotic) and would be difficult to detect except by an effective disease surveillance mechanism. The threat posed by bioterrorism is nearly as great as that by natural epidemic causing agents.

Mitigation

The essential protection against natural and artificial outbreaks of disease (bioterrorism) will include the development of mechanisms for prompt detection of incipient outbreaks, isolation of the infected persons and the people they have been in contact with and mobilisation of investigational and therapeutic countermeasures. In the case of deliberately generated outbreaks (bioterrorism) the spectrum of possible pathogens is narrow, while natural outbreaks can have a wide range of organisms. The mechanism required however, to face both can be similar if the service providers are adequately sensitised.

The response to these challenges will be coordinated by the nodal ministry—Ministry of Health and Family Welfare (MoH&FW) with inputs from the Ministry of Agriculture (MoA) for agents affecting animals and crops. The support and input of other ministries like Ministry of Home Affairs (MHA), Ministry of Defence (MoD), Ministry of Railways (MoR) and Ministry of Labour and Employment (MoL&E), who have their own medical care infrastructure with capability of casualty evacuation and treatment, have an important role to play. With a proper surveillance mechanism and response system in place, epidemics can be detected at the beginning stage of their outbreak and controlled. Slowly evolving epidemics do not cause upheavals in society and will not come under the crisis management scenario usually. They will be tackled by ongoing national programmes like the Revised National Tuberculosis Control Programme and National Air Quality Monitoring Programme. There may, however, be specific situations when the disaster response mechanism may be evoked, e.g., an outbreak of Plasmodium falciparum malaria erupting after an exceptionally wet season in a previously non-endemic region and epidemics occurring as a consequence of an attack of bioterrorism.

Epidemics do not respect national borders. As international travel is easy, biological agents need to be tracked so that they do not enter new regions across the boundaries. This aspect has made international collaboration crucial for epidemic control. International organisations like the World

Health Organization (WHO), Food and Agricultural Organization (FAO), Office International des Épizooties (OIE) as well as some national agencies with global reach, e.g., Center for Disease Control and Prevention (CDC), United States of America (USA) have an important role to play and cooperation with them is necessary.

COVID 19 Pandemic

India faces a host of biological risk factors. Drawing lessons from the coronavirus pandemic and prior biological disasters, India's government should pursue new safety protocols and develop new institutions to manage future biological risk

Infectious diseases such as COVID-19, the disease caused by the novel coronavirus; severe acute respiratory syndrome (SARS); Middle East respiratory syndrome (MERS); and the diseases caused by the Ebola, Nipah, and Zika viruses have exposed countries' susceptibility to naturally occurring biological threats. Even though scientists from multiple countries concluded that the virus responsible for the coronavirus pandemic shifted naturally from an animal source to a human host,1 the international community should not ignore the possibility of pathogens escaping accidentally from research labs and threats of deliberate manipulation to create more dangerous bioweapons.

India is especially vulnerable to such infections because of its geographical position, large population, low healthcare spending, minimal expenditure on research that benefits public health, weak coordination between central and state health authorities, limited involvement of private actors, poor awareness of biosecurity, and the rickety state of public health infrastructure. Most recently, COVID-19 has revealed the deep fault lines in India's public health infrastructure, including a shortage of healthcare workers, lack of trained epidemiologists, scarcity of medical equipment, poor access to healthcare facilities in rural areas, and inefficient disease reporting and surveillance in most states. The pandemic should therefore be a wake-up call for India to assess gaps in its public health infrastructure and divert its resources toward the healthcare sector to prepare itself for both natural and man-made biological emergencies.

Like any country, India faces three major biological threats: naturally occurring infections in humans or animals, or agricultural infestations; infections arising from accidental release of pathogens into the environment; and possible outbreaks caused by deliberate weaponization of dangerous pathogens that affect humans, animals, or crops. These threats—either alone or together—will force India to strengthen its capacity to detect and respond to them.

In all of this, there is a further challenge to wisely manage the trade offs between regulations to reduce the risks of accidents and attacks, on the one hand, and on the other, policies that enable government, scientific researchers, and industry to develop and market beneficial applications of biotechnology. Breakthroughs in biotechnology will be necessary to treat or vaccinate people against naturally occurring diseases as well as to detect and counter potential human-made threats and their consequences. This means researchers, businesses, regulators, media platforms, nongovernmental organizations, and voters must strive to educate themselves and their audiences or constituencies about possible threats and about the socially beneficial ways to prevent and manage them.

SAFETY AND SECURITY REGULATIONS AND POLICIES

To address safety and security risks, India follows two different approaches—biosafety and biosecurity. Biosafety seeks to protect humans from pathogens while biosecurity protects pathogens from humans.2 Though these two concepts and practices reflect diverse scenarios and mitigate different risks, they complement each other. Robust implementation of biosafety protocols, in addition to reducing the risk of accidental exposure, limits risks of intentional theft or misuse.8

Biosafety regulations in India are defined under the 1986 Environment Protection Act, with implementation broadly distributed between the Ministry of Science and Technology and the Ministry of Environment, Forest, and Climate Change (MOEFCC). These regulations have three aims:

To prevent biological materials from escaping designated places in laboratories

To prevent laboratory workers from unintentional exposure

To prevent unintended consequences when genetically modified organisms are released purposefully into the environment

Like biosafety, biosecurity regulations in India, although not clearly defined and categorized, empower different ministries or agencies that are responsible for sectors usually associated with human health, food safety, agriculture, livestock, and the environment. As no uniform definition of biosecurity exists globally, the concept differs across human, animal, and plant health sectors. Biosecurity for public health often refers to "the protection of microbiological assets from theft, loss or diversion, which could lead to the inappropriate use of these agents to cause public health harm."4 However, because biosecurity for plant and animal health entails protecting biological resources from foreign or invasive species,5 regulations in India are broad enough to cover four major aims:

To prevent unauthorized or ill-conceived release of naturally occurring biological agents

To prevent cross-border entry and movement of dangerous pests and pathogens

To prevent theft or acquisition of sensitive research, organisms, and information for nonlegitimate use

To prevent weaponization of pathogens by both state and nonstate actors

IMPLEMENTATION

Even though India has enacted laws and regulations to protect the country from biological threats, the coordination and monitoring of their implementation remains irregular.

For the first category of biological threats—diseases emerging from natural sources—India has invested in a public health infrastructure and has various laws and guidelines that drive preparedness and response to naturally occurring disease outbreaks. However, India's response to the avian influenza, Nipah virus disease, and COVID-19 has exposed the country's rickety public health infrastructure, poor disease surveillance network, inadequate coordination between ministries to prevent zoonotic infections, absence of a national policy on biological disasters, and dismal investment in scientific research. Rather than using the time between outbreaks to develop national guidelines to tackle infectious diseases, India mostly relies on ad hoc notifications and guidelines, along with World Health Organization (WHO) advisories.

For the second category of threats—diseases caused by accident—India has developed comprehensive biosafety guidelines to monitor the safety of biotechnological research. Although implementation of biosafety guidelines falls under the ambit of the Ministry of Science and Technology and MOEFCC, researchers often work in labs supported by the Indian Council of Medical Research (ICMR) and the Indian Council of Agricultural Research, which are research bodies set up under the Ministry of Health and Family Welfare (MOHFW) and the Ministry of Agriculture and Farmers' Welfare. The multiplicity of organizations operating under different ministries makes it difficult to ensure implementation of biosafety guidelines across the country. Moreover, the system often experiences poor coordination between center and state regulatory units. In addition, some experts interviewed during the project note that while scientists or researchers perform all necessary safety tests before approaching the regulatory authorities, the approval agencies, perhaps influenced by activist groups, perform additional safety tests that delay the clearance of such products.6 Whether such additional tests are necessary or not is often disputed.

For the third category of biological threats—threats emerging from intentional sources—India has no specific biosecurity policy or legislation but has a multiplicity of regulations that address threats emerging from different sources. However, entities set up under different ministries with inadequate collaboration among them leaves India vulnerable to a variety of foreign threats. While security agencies, such as the National Security Council Secretariat, are responsible for investigating a security threat, response to an event is often coordinated by civilian ministries.7 Because threats emerging from biological sources have a technical component, security agencies often include experts from other government departments, such as the Defence Research and Development Organisation, for their scientific inputs. Some experts, however, highlight that biosecurity discussions are mostly confined to closed policy circles and rarely involve experts from outside the government, leading to poor nationwide biosecurity awareness in India. Further, most regulations cover the export and import of pests and pathogens but do not adequately cover commercially ordered (mostly through e-commerce platforms) deoxyribonucleic acid (DNA) and ribonucleic acid (RNA) sequences that may encode virulent genes. At present, biosecurity regulations often empower customs officials as the only authority that can check the baggage of incoming passengers. But most customs officials are inadequately trained to identify specific pests or pathogens. In addition, there seems to be no systematic assessment of vulnerabilities in the existing system nor development plans and methodologies to build a sustainable, functional, and well-equipped system to counter biothreats.

Beyond the need to prevent outbreaks caused by safety and security lapses, any system must also be able to respond to threats whether they occur through human action (and inaction) or through natural processes. Although security agencies require time to investigate if an outbreak is natural or man-made, the mitigation strategy to tackle the threat must be prepared in advance and implemented immediately after detection of an outbreak.

MAJOR RECOMMENDATIONS

As the spread of infectious diseases is a long-term, continuous, and evolving threat, India may need an agency specifically responsible for preventing and managing biological threats. India could consider investing in an agency that can coordinate policy responses for any biological emergency. A full-time Office of Biological Threats Preparedness and Response (BTPR) under the National Disaster Management Authority (NDMA) is being suggested as an alternative. This paper sketched out this idea to stimulate further dialogue among interested stakeholders. This office could focus on naturally occurring diseases, threats emerging from laboratory accidents, and deliberate weaponization of diseases. Because India has numerous organizations that sometimes perform overlapping roles with limited or no coordination with each other, the office could become a nodal agency that brings together experts from different ministries, representatives from the private sector, and experts from the academic and scientific community.

Whether or not a new office is set up, it is important for India to review domestic measures needed to predict, prevent, and respond to both natural and man-made biological threats. These measures include:

- Periodic training of healthcare workers on nursing practices, safe handling of samples, decontamination procedures, and proper disposal of biomedical waste;
- Strengthening cooperation between central and state health authorities;
- Introducing clearer and stronger incentives for personnel to identify and report disease outbreaks among plants, animals, and humans to strengthen the disease surveillance network;
- Aggregating data obtained from different disease surveillance programs that collect data on plant, animal, and human health to detect outbreaks in a timely manner;
- Developing common disease reporting standards to harmonize data collection from all organizations reporting disease outbreaks;
- Creating an epidemiological model for diseases through collaboration between government, scientists, academicians, industry, epidemiologists, and data scientists;
- Implementing capacity-building measures, such as engaging with local donors to mobilize resources needed to ramp up public health infrastructure, increasing funding to research bodies, introducing incentives to invest in biotechnology research, and fostering collaboration between the scientific and the policy community, which should all be encouraged to strengthen India's preparedness for biological threats;
- Conducting surprise on-site inspections by members of the government-led Review Committee on Genetic Manipulation (RCGM), the Genetic Engineering Appraisal Committee (GEAC), and state regulatory authorities to ensure rigorous monitoring of biotechnological research;
- Harmonization of application protocols and introduction of standard evaluation forms for researchers applying for approvals to commercialize biotechnology-derived products;

- Introducing mandatory certification and validation for BSL-2 labs that sometimes work with high-risk pathogens;
- Developing a formal biosecurity policy that encompasses threats emerging from different sectors such as plant health, animal health, and public health to avoid any overlaps or coordination issues;
- Conducting specific training sessions for customs officials to identify specific pests or pathogens that might pose a risk to India's national security;
- Introducing simulation exercises to develop standard operating protocols that can be implemented during the time of a crisis, like inexpensive tabletop exercises that can help generate awareness among relevant agencies and can be useful for monitoring, assessing, and strengthening the capabilities of emergency policies, plans, and procedures.

UNIT 4

OSHA has recently updated the Guidelines for Safety and Health Programs it first released 30 years ago, to reflect changes in the economy, workplaces, and evolving safety and health issues. The new Recommended Practices have been well received by a wide variety of stakeholders and are designed to be used in a wide variety of small and medium-sized business settings. The Recommended Practices present a step-by-step approach to implementing a safety and health program, built around seven core elements that make up a successful program.

The main goal of safety and health programs is to prevent workplace injuries, illnesses, and deaths, as well as the suffering and financial hardship these events can cause for workers, their families, and employers. The recommended practices use a proactive approach to managing workplace safety and health. Traditional approaches are often reactive –that is, problems are addressed only after a worker is injured or becomes sick, a new standard or regulation is published, or an outside inspection finds a problem that must be fixed. These recommended practices recognize that finding and fixing hazards before they cause injury or illness is a far more effective approach.

The idea is to begin with a basic program and simple goals and grow from there. If you focus on achieving goals, monitoring performance, and evaluating outcomes, your workplace can progress along the path to higher levels of safety and health achievement.

Employers will find that implementing these recommended practices also brings other benefits. Safety and health programs help businesses:

- **Prevent** workplace injuries and illnesses
- **Improve** compliance with laws and regulations
- **Reduce** costs, including significant reductions in workers' compensation premiums
- **Engage** workers
- **Enhance** their social responsibility goals
- **Increase** productivity and enhance overall business operations

How To Create a Safe Working Environment

Workplace safety should never be taken lightly with any business. Doesn't matter if you're 1,000 employees strong or 10. Any businesses, regardless of size, must account for safety regulations, steps, and more detailed options for their staff from the get-go. Preventative measures against accidents and/or workplace-related deaths are key for fostering a healthy, safe work environment.

There are some companies out there who may not be fully versed in workplace safety regulations or might not be equipped in every area of the office to handle any unforeseen circumstances.

For instance, let's say you're a towing and shipping company and most of your workforce is tied up in manual labor sectors where lifting, packing and stacking heavy shipments will occur more frequently. Or, on the opposite end of the spectrum, you're an accounting firm where there's hardly any lifting or physically demanding labor going on.

Both examples still must heed similar safety rules, have a system in place to readily inform each and every employee on preventative tips and regulations, and strive to accomplish what your business wants most: everyday safety. From OSHA compliance to inspections, there's a whole laundry list of tips on workplace safety that businesses can take with them. Some are simple, while others are a bit more complex in nature, but at the end of the day, they all can contribute to a safer haven for your staff.

1. Proper Uniforms

This is a critical base for businesses such as construction, home improvement, the aforementioned packing and shipping corporations on down to firefighters and other areas that require overly-protective headgear and uniforms. Construction workers must be wearing hard hats at all times in specified zones of the job site. Firefighters must have the latest fire-retardant outfits to go along with sturdy helmets. Chemists must wear safety goggles while they are inside a laboratory.

Putting up signs to reinforce the matter and educating the supervisors to stay on top of uniform regulations should be active from the moment the first employee clocks in to the last.

2. Designate Proper Emergency Exits

There's a reason we did three or four fire drill exercises as a kid each year in school. As annoying and (forgive the pun) alarming as they could be, it helped everyone in the building familiarize themselves with the exits. This same exercise should apply for every business. Not that every employee go in a single-file order and move at the sound of an alarm, just that they are aware and have some document that outlines emergency procedures.

This document should map out every exit doorway, ensure you have emergency exit signs posted in their assigned posts, detail up-to-date smoke detectors, signify water spouts to quench possible fires and assure you and your staff that each building code is covered front-to-back.

3. Open Discussions

Setting aside time at the end of the day once a month to discuss safety rules and general working environment is a great way for managers and supervisors to assess the overall quality of current measures taken. Getting feedback from employees is helpful because it opens the manager's eyes to potential hazards that went unnoticed, how well certain areas are doing and little touch-ups here and there that go a long way towards keeping employees safe and happy in the office.

4. Promote Health Codes

You know those signs you see when entering a restaurant bathroom next to the sink that inform you that all employees must wash their hands before exiting? Having little indicators like those in the wash room, in the kitchen and general areas of heavy foot traffic is important on many fronts. The most important being health code standards, educating cleanliness, and encouraging employees to take every step necessary to make the room healthy for the next individual.

5. Proofing The Building

caution signThis falls in the category of getting the building inspected from time to time on down to subtle improvements around the building, stairways and exterior pathways. Little safety measures like adding ribbed, rubber padding along the ends of stairway steps, de-icing the walkways leading up to the office, mats to stamp out slippery footing and other helpful precautions can give your employees as much peace of mind to know their well-being is being accounted for as much as possible.

In summary, here's how you can create a safe working environment in 5 steps:

- Ensure that you are dressed appropriately for your working conditions and that all safety equipment is up to date.
- Communicate the emergency plan and make sure exits routes are properly designated.
- Discuss safety rules and general working practices. Getting regular feedback will ensure a safe and healthy work environment.
- Promote health codes and standards by educating your employees on the importance of health safety and cleanliness.
- Inspect your working area and building. Ensure that walking paths are clear, stairs, and railing are secure and slip-proof.

These tips can help businesses from all over achieve a healthy balance between workplace security and overall productivity.

Job Safety Analysis (JSA)

What is a Job Safety Analysis?

A job safety analysis (JSA) is a procedure which helps integrate accepted safety and health principles and practices into a particular task or job operation. In a JSA, each basic step of the job is to identify potential hazards and to recommend the safest way to do the job. Other terms used to describe this procedure are job hazard analysis (JHA) and job hazard breakdown.

Some individuals prefer to expand the analysis into all aspects of the job, not just safety. This approach is known as total job analysis. Methodology is based on the idea that safety is an integral part of every job and not a separate entity. In this document, only health and safety aspects will be considered.

The terms "job" and "task" are commonly used interchangeably to mean a specific work assignment, such as "operating a grinder," "using a pressurized water extinguisher," or "changing a flat tire." JSAs are not suitable for jobs defined too broadly, for example, "overhauling an engine"; or too narrowly, for example, "positioning car jack."

What are the benefits of doing a Job Safety Analysis?

One of the methods used in this example is to observe a worker actually perform the job. The major advantages of this method include that it does not rely on individual memory and that observing or performing the process prompts the recognition of hazards. For infrequently performed or new jobs, observation may not be practical.

One approach is to have a group of experienced workers and supervisors complete the analysis through discussion. An advantage of this method is that more people are involved in a wider base of experience and promoting a more ready acceptance of the resulting work procedure. Members of the health and safety committee must also participate in this process.

Initial benefits from developing a JSA will become clear in the preparation stage. The analysis process may identify previously undetected hazards and increase the job knowledge of those participating. Safety and health awareness is raised, communication between workers and supervisors is improved, and acceptance of safe work procedures is promoted.

A JSA, or better still, a written work procedure based on it, can form the basis for regular contact between supervisors and workers. It can serve as a teaching aid for initial job training and as a briefing guide for infrequent jobs. It may be used as a standard for health and safety inspections or observations. In particular, a JSA will assist in completing comprehensive accident investigations.

What are the four basic steps?

Four basic stages in conducting a JSA are:

- selecting the job to be analyzed
- breaking the job down into a sequence of steps
- identifying potential hazards
- determining preventive measures to overcome these hazards

Where do I begin?

1. Involve your employees. It is very important to involve your employees in the hazard analysis process. They have a unique understanding of the job, and this knowledge is invaluable for finding hazards. Involving employees will help minimize oversights, ensure a quality analysis, and get workers to "buy in" to the solutions because they will share ownership in their safety and health program.

2. Review your accident history. Review with your employees your worksite's history of accidents and occupational illnesses that needed treatment, losses that required repair or replacement, and any "near misses" — events in which an accident or loss did not occur, but could have. These events are indicators that the existing hazard controls (if any) may not be adequate and deserve more scrutiny.

3. Conduct a preliminary job review. Discuss with your employees the hazards they know exist in their current work and surroundings. Brainstorm with them for ideas to eliminate or control those hazards.

If any hazards exist that pose an immediate danger to an employee's life or health, take immediate action to protect the worker. Any problems that can be corrected easily should be corrected as soon as possible. Do not wait to complete your job hazard analysis.

This will demonstrate your commitment to safety and health and enable you to focus on the hazards and jobs that need more study because of their complexity.

4. **List, rank, and set priorities for hazardous jobs.** List jobs with hazards that present unacceptable risks, based on those most likely to occur and with the most severe consequences. These jobs should be your first priority for analysis.

5**. Outline the steps or tasks**. Nearly every job can be broken down into job tasks or steps. When beginning a job hazard analysis, watch the employee perform the job and list each step as the worker takes it. Be sure to record enough information to describe each jobaction without getting overly detailed. Avoid making the breakdown of steps so detailed that it becomes unnecessarily long or so broad that it does not include basic steps. You may find it valuable to get input from other workers who have performed the same job.

Later, review the job steps with the employee to make sure you have not omitted something. Point out that you are evaluating the job itself, not the employee's job performance. Include the

employee in all phases of the analysis—from reviewing the job steps and procedures to discussing uncontrolled hazards and recommended solutions.
Sometimes, in conducting a job hazard analysis, it may be helpful to photograph or videotape the worker performing the job. These visual records can be handy references when doing a more detailed analysis of the work.

What are the benefits of a JSA?

- Ensuring consistent and safe work methods.
- Reducing injuries by helping employees know how to best perform a task without the likelihood of injury.
- Provides a form of training documentation regarding the employee's knowledge of the job safety requirements.
- Complies with many OSHA requirements.

When is a JSA recommended?

- A job/task has a high injury rate.
- A job/task has the potential to cause severe or disabling injuries or illness, even if there is no history of previous incidents.
- An employee has a safety concern about a job.
- Jobs that are new to your operation or have undergone changes in processes and procedures.

What is important to know when "selecting the job"?

Ideally, all jobs should be subjected to a JSA. In some cases there are practical constraints posed by the amount of time and effort required to do a JSA. Another consideration is that each JSA will require revision whenever equipment, raw materials, processes, or the environment change. For these reasons, it is usually necessary to identify which jobs are to be analyzed. Even if analysis of all jobs is planned, this step ensures that the most critical jobs are examined first.

Factors to be considered in setting a priority for analysis of jobs include:

- Accident frequency and severity: jobs where accidents occur frequently or where they occur infrequently but result in serious injuries.
- Potential for severe injuries or illnesses: the consequences of an accident, hazardous condition, or exposure to harmful products are potentially severe.
- Newly established jobs: due to lack of experience in these jobs, hazards may not be evident or anticipated.
- Modified jobs: new hazards may be associated with changes in job procedures.
- Infrequently performed jobs: workers may be at greater risk when undertaking non-routine jobs, and a JSA provides a means of reviewing hazards.

What jobs are appropriate for a job hazard analysis?

A job hazard analysis can be conducted on many jobs in your workplace. Priority should go to the following types of jobs:

- Jobs with the highest injury or illness rates;
- Jobs with the potential to cause severe or disabling injuries or illness, even if there is no history of previous accidents;
- Jobs in which one simple human error could lead to a severe accident or injury;
- Jobs that are new to your operation or have undergone changes in processes and procedures; and
- Jobs complex enough to require written instructions

How do I break the job into "basic steps"?

After a job has been chosen for analysis, the next stage is to break the job into steps. A job step is defined as a segment of the operation necessary to advance the work. See examples below.

Care must be taken not to make the steps too general. Missing specific steps and their associated hazards will not help. On the other hand, if they are too detailed, there will be too many steps. A rule of thumb is that most jobs can be described in less than ten steps. If more steps are required, you might want to divide the job into two segments, each with its separate JSA, or combine steps where appropriate. As an example, the job of changing a flat tire will be used in this document.

An important point to remember is to keep the steps in their correct sequence. Any step which is out of order may miss serious potential hazards or introduce hazards which do not actually exist.

Each step is recorded in sequence. Make notes about what is done rather than how it is done. Each item is started with an action verb. Appendix A (below) illustrates a format which can be used as a worksheet in preparing a JSA. Job steps are recorded in the left hand column, as shown here:

Sequence of Events	Potential Accidents or Hazards	Preventive Measures
Park vehicle		
Remove spare and tool kit		
Pry off hub cap and loosen lug bolts (nuts)		
And so on.....		

This part of the analysis is usually prepared by knowing or watching a worker do the job. The observer is normally the immediate supervisor. However, a more thorough analysis often happens by having another person, preferably a member of the health and safety committee, participate in the observation. Key points are less likely to be missed in this way.

The job observer should have experienced and be capable in all parts of the job. To strengthen full co-operation and participation, the reason for the exercise must be clearly explained. The JSA is neither a time and motion study in disguise, nor an attempt to uncover individual unsafe acts. The job, not the individual, is being studied in an effort to make it safer by identifying hazards and making modifications to eliminate or reduce them. The worker's experience contributes in making job and safety improvements.

The job should be observed during normal times and situations. For example, if a job is routinely done only at night, the JSA review should also be done at night. Similarly, only regular tools and equipment should be used. The only difference from normal operations is the fact that the worker is being observed.

When completed, the breakdown of steps should be discussed by all the participants (always including the worker) to make that all basic steps have been noted and are in the correct order.

How do I "identify potential hazards"?

Once the basic steps have been recorded, potential hazards must be identified at each step. Based on observations of the job, knowledge of accident and injury causes, and personal experience, list the things that could go wrong at each step.

A second observation of the job being performed may be needed. Since the basic steps have already been recorded, more attention can now be focused on each potential hazards. At this stage, no attempt is made to solve any problems which may have been detected.

To help identify potential hazards, the job analyst may use questions such as these (this is not a complete list):

- Can any body part get caught in or between objects?
- Do tools, machines, or equipment present any hazards?
- Can the worker make harmful contact with moving objects?
- Can the worker slip, trip, or fall?
- Can the worker suffer strain from lifting, pushing, or pulling?
- Is the worker exposed to extreme heat or cold?
- Is excessive noise or vibration a problem?
- Is there a danger from falling objects?
- Is lighting a problem?
- Can weather conditions affect safety?
- Is harmful radiation a possibility?
- Can contact be made with hot, toxic, or caustic products?
- Are there dusts, fumes, mists, or vapours in the air?

Potential hazards are listed in the middle column of the worksheet, numbered to match the corresponding job step. For example:

Sequence of Events	**Potential Accidents or Hazards**	**Preventive Measures**
Park vehicle	a) Vehicle too close to passing traffic b) Vehicle on uneven, soft ground c) Vehicle may roll	
Remove spare and tool kit	a) Strain from lifting spare	
Pry off hub cap and loosen lug bolts (nuts)	a) Hub cap may pop off and hit you b) Lug wrench may slip	
And so on.....	a) ...	

Again, all participants should jointly review this part of the analysis.

How do I "determine preventive measures?"

The final stage in a JSA is to determine ways to eliminate or control the hazards identified. The generally accepted measures, in order of preference, are:

1. Eliminate the hazard

Elimination is the most effective measure. These techniques should be used to eliminate the hazards:

- Choose a different process
- Modify an existing process
- Substitute with less hazardous product
- Improve environment (e.g., ventilation)
- Modify or change equipment or tools

2. Contain the hazard

If the hazard cannot be eliminated, contact might be prevented by using enclosures, machine guards, worker booths or similar devices.

3. Revise work procedures

Consideration might be given to modifying steps which are hazardous, changing the sequence of steps, or adding additional steps (such as locking out energy sources).

4. Reduce the exposure

These measures are the least effective and should only be used if no other solutions are possible. One way of minimizing exposure is to reduce the number of times the hazard is encountered. An example would be modifying machinery so that less maintenance is necessary. The use of appropriate personal protective equipment may be required. To reduce the severity of an incident, emergency facilities, such as eyewash stations, may need to be provided.

In listing the preventive measures, do not use general statements such as "be careful" or "use caution". Specific statements which describe both what action is to be taken and how it is to be performed are preferable. The recommended measures are listed in the right hand column of the worksheet, numbered to match the hazard in question. For example:

Sequence of Events	Potential Accidents or Hazards	Preventive Measures

Park vehicle	a) Vehicle too close to passing traffic b) Vehicle on uneven, soft ground c) Vehicle may roll	a) Drive to area well clear of traffic. Turn on emergency flashers b) Choose a firm, level parking area c) Apply the parking brake; leave transmission in PARK; place blocks in front and back of the wheel diagonally opposite to the flat
Remove spare and tool kit	a) Strain from lifting spare	a) Turn spare into upright position in the wheel well. Using your legs and standing as close as possible, lift spare out of truck and roll to flat tire.
Pry off hub cap and loosen lug bolts (nuts)	a) Hub cap may pop off and hit you b) Lug wrench may slip	a) Pry off hub cap using steady pressure b) Use proper lug wrench; apply steady pressure slowly
And so on.....	a) ...	a) ...

How should I make the information available to everyone else?

JSA is a useful technique for identifying hazards so that workers can take measures to eliminate or control hazards. Once the analysis is completed, the results must be communicated to all workers who are, or will be, performing that job. The side-by-side format used in JSA worksheets is not an ideal one for instructional purposes. Better results can be achieved by using a narrative-style communication format. For example, the work procedure based on the partial JSA developed as an example in this document might start out like this:

1. Park vehicle

a) Drive vehicle off the road to an area well clear of traffic, even if it requires rolling on a flat tire. Turn on the emergency flashers to alert passing drivers so that they will not hit you.

b) Choose a firm and level area for parking. You can jack up the vehicle to prevent rolling.

c) Apply the parking brake, leave the transmission in PARK, place blocks in front and back of the wheel diagonally opposite the flat. These actions will also help prevent the vehicle from rolling.

2. Remove spare and tool kit

a) To avoid back strain, turn the spare up into an upright position in its well. Stand as close to the trunk as possible and slide the spare close to your body. Lift out and roll to flat tire.

3. Pry off hub cap, loosen lug bolts (nuts)

a) Pry off hub cap slowly with steady pressure to prevent it from popping off and striking you.

b) Using the proper lug wrench, apply steady pressure slowly to loosen the lug bolts (nuts) so that the wrench will not slip, get lost or and hurt your knuckles.

On the other hand, security is the freedom from fear, anxiety and doubts concerning human as well as protection against thefts of guest, employee or hotel property.

Three “E” of Safety

Safety Education

Employees should be encouraged to come up with ideas for inculcating safety into hotel methods because safety programs and policies are only effective when practised accordingly. Proper training should be provided to each staff.

- Teaching safe method, with emphasis on areas of potential danger and how they can be guarded.
- Demonstration of use of safety equipment
- Ability to recognize the sign of hazard around them.
- Teaching legal implication of non-adherence to safety procedure.

Safety Engineering

It is done in the designing phase of the establishment. Generally, equipment, furniture and fittings are allocated the space in accordance with the safety measures.

Safety Rules Enforcement

Rules are not meant only to be made. Proper implementation and following the rules become quite necessary. Motivation and enforcement are to be ensured.

Safety Awareness and Accident Prevention

Safety awareness should be an ongoing programme at all establishments. Various laws and rules for ensuring the safety in the establishments have been devised out by the Government. Safe work environments and safety of the employees should be taken care by the Management.

In order to raise AWARENESS, following points should be kept in mind:

- All employees should be well aware of the potential hazards in their respective department.
- H.O.D. should ensure that employees follow safe job procedures, correct unsafe conditions immediately and do not work in hurry to avoid accidents.
- Housekeeping Safety Manual enlisting safety rules should be prepared.

Basic Guidelines for the Prevention of Accidents

Prevention is better than cure. If we prevent accidents to happen, then it becomes easy for us to provide the maximum efficiency during work.

Following guidelines should be following in order to prevent accidents:

- Always follow instruction while using any cleaning equipment.
- Replace cap on cleaning chemicals immediately and securely after dispensing.
- Label cleaning agents clearly.
- Keep floors clean and dry.
- Place warning signs around the area while cleaning.
- Always dry hand before touching any electrical pieces of equipment or wiring.
- Clean away broken glass carefully.
- Mark faulty equipment as ‘OOO’ (Out Of Order)
- Dispose off rubbish carefully.
- Never place sharp objects or cigarette butts in trash bags.
- Action in case an accident occurs
- An accident may happen anywhere, anytime with either the guest or employees.

Following preventing measures can be used:

- With the help of another person, check if the victim requires any assistance.
- Report the matter immediately to the manager concerned.
- Either administer First-Aid or get help from trained personnel.
- Transport the victim immediately to a hospital if required.
- Fill in the accident report form.

Risk management is the process of identifying, assessing and controlling threats to an organization's capital and earnings. These risks stem from a variety of sources including financial uncertainties, legal liabilities, technology issues, strategic management errors, accidents and natural disasters.

A successful risk management program helps an organization consider the full range of risks it faces. Risk management also examines the relationship between risks and the cascading impact they could have on an organization's strategic goals.

This holistic approach to managing risk is sometimes described as enterprise risk management because of its emphasis on anticipating and understanding risk across an organization. In addition to a focus on internal and external threats, enterprise risk management (ERM) emphasizes the importance of managing positive risk. Positive risks are opportunities that could increase business value or, conversely, damage an organization if not taken. Indeed, the aim of any risk management program is not to eliminate all risk but to preserve and add to enterprise value by making smart risk decisions.

"We don't manage risks so we can have no risk. We manage risks so we know which risks are worth taking, which ones will get us to our goal, which ones have enough of a payout to even take them," said Forrester Research senior analyst Alla Valente, a specialist in governance, risk and compliance.

Thus, a risk management program should be intertwined with organizational strategy. To link them, risk management leaders must first define the organization's risk appetite -- i.e., the amount of risk it is willing to accept to realize its objectives.

Why is risk management important?

Risk management has perhaps never been more important than it is now. The risks modern organizations face have grown more complex, fueled by the rapid pace of globalization. New risks are constantly emerging, often related to and generated by the now-pervasive use of digital technology. Climate change has been dubbed a "threat multiplier" by risk experts.

A recent external risk that manifested itself as a supply chain issue at many companies -- the coronavirus pandemic -- quickly evolved into an existential threat, affecting the health and safety of their employees, the means of doing business, the ability to interact with customers and corporate reputations.

Businesses made rapid adjustments to the threats posed by the pandemic. But, going forward they are grappling with novel risks, including how or whether to bring employees back to the office and what should be done to make their supply chains less vulnerable to crises.

As the world continues to reckon with COVID-19, companies and their boards of directors are taking a fresh look at their risk management programs. They are reassessing their risk exposure and examining risk processes. They are reconsidering who should be involved in risk management. Companies that currently take a reactive approach to risk management -- guarding against past risks and changing practices after a new risk causes harm -- are considering the competitive advantages of a more proactive approach. There is heightened interest in supporting sustainability, resiliency and enterprise agility. Companies are also exploring how artificial intelligence technologies and sophisticated governance, risk and compliance (GRC) platforms can improve risk management.

Financial vs. nonfinancial industries. In discussions of risk management, many experts note that at companies that are heavily regulated and whose business is risk, managing risk is a formal function.

Banks and insurance companies, for example, have long had large risk departments typically headed by a chief risk officer (CRO), a title still relatively uncommon outside of the financial industry. Moreover, the risks that financial services companies face tend to be rooted in numbers and therefore can be quantified and effectively analyzed using known technology and mature methods. Risk scenarios in finance companies can be modeled with some precision.

For other industries, risk tends to be more qualitative and therefore harder to manage, increasing the need for a deliberate, thorough and consistent approach to risk management, said Gartner analyst Matt Shinkman, who leads the firm's enterprise risk management and audit practices. "Enterprise risk management programs aim to help these companies be as smart as they can be about managing risk."

The 5 Step Risk Management Process

1. Identify potential risks

What can possibly go wrong?

The four main risk categories of risk are *hazard risks*, such as fires or injuries; *operational risks*, including turnover and supplier failure; *financial risks*, such as economic recession; and *strategic risks*, which include new competitors and brand reputation. Being able to identify what types of risk you have is vital to the risk management process.

An organization can identify their risks through experience and internal history, consulting with industry professionals, and external research. They may also try interviews or group brainstorming, It’s important to remember that the risk environment is always changing, so this step should be revisited regularly.

2. Measure frequency and severity

What is the likelihood of a risk occurring and if it did, what would be the impact?

Many organizations use a heat map to measure their risks on this scale. A risk map is a visual tool that details which risks are frequent and which are severe (and thus require the most resources). This will help you identify which are very unlikely or would have low impact, and which are very likely and would have a significant impact.

Knowing the frequency and severity of your risks will show you where to spend your time and money, and allow your team to prioritize their resources.

3. Examine alternative solutions

What are the potential ways to treat the risk and of these, which strikes the best balance between being affordable and effective? Organizations usually have the options to accept, avoid, control, or transfer a risk.

Accepting the risk means deciding that some risks are inherent in doing business and that the benefits of an activity outweigh the potential risks.

To *avoid a risk*, the organization simply has to not participate in that activity.

Risk control involves prevention (reducing the likelihood that the risk will occur) or mitigation, which is reducing the impact it will have if it does occur.

Risk transfer involves giving responsibility for any negative outcomes to another party, as is the case when an organization purchases insurance.

4. Decide which solution to use and implement it

Once all reasonable potential solutions are listed, pick the one that is most likely to achieve desired outcomes.

Find the needed resources, such as personnel and funding, and get the necessary buy-in. Senior management will likely have to approve the plan, and team members will have to be informed and trained if necessary.

Set up a formal process to implement the solution logically and consistently across the organization, and encourage employees every step of the way.

5. Monitor results

Risk management is a process, not a project that can be “finished” and then forgotten about. The organization, its environment, and its risks are constantly changing, so the process should be consistently revisited.

Determine whether the initiatives are effective and whether changes or updates are required. Sometimes, the team may have to start over with a new process if the implemented strategy is not effective

Risk management standards

What are Risk management standards?

Risk Management Standards set out a specific set of strategic processes which start with the overall aspirations and objectives of an organisation, and intend to help to identify risks and promote the mitigation of risks through best practice. Standards are often designed and created by a number of agencies who are working together to promote common goals, to help to ensure that organisations carry out high-quality risk management processes.

What are Risk management standards like?

Risk management standards are like a guide to help ensure that risk management is carried out in a proper way. Standards usually include checkpoints and examples, to make it really easy for organisations to comply.

What is the purpose of Risk management standards?

Risk management standards have been designed so that those who must carry out risk management processes have a guide to help them to work. These standards help to provide an international consensus on how to deal with certain risks, and they offer best practice advice on how to deal with others. Risk management standards help organisations to implement strategies which are tried and tested, and proven to work.

What are the different types of Risk management standards?

The ISO 31000 risk management standards framework includes:

- ISO 31000:2009 – Principles and Guidelines on Implementation
- ISO/IEC 31010:2009 – Risk Management – Risk Assessment Techniques
- ISO Guide 73:2009 – Risk Management – Vocabulary

These ISO standards are designed to help guide organisations with a number of different strands of risk management.

As well as the popular ISO standards, FERMA has also produced its own risk management standard, which offers guidance for the whole processes, from identifying risks, right through to transferring some of that risk to another party.

What's involved with accessing Risk management standards?

Risk management standards are produced by a number of different organisations worldwide. In order to access their risk management standards, you will have to visit the websites of these associations, or get in contact with them some other way. For example, the FERMA risk management standards are available on the FERMA website, and have been translated into a number of different languages, for ease of access.
Complying with some standards can earn an organisation an accreditation.

Where do Risk management standards fit into the risk management process?

Risk management standards are usually introduced at the beginning of the risk management process, as they offer guidance on how to best complete the process. They may also be considered when looking at existing risk management processes, as they can be used to assess whether the strategies are sufficient.

How do Risk management standards impact on managing organisational risk?

Risk Management standards impact on the ways which risk management processes are created and implemented. They offer guidance on setting the context of the strategies, as well as providing ideas about what should and should not be implemented as part of the risk management strategy. Many standards provide advice on how to best to quantify and classify risk.

What terms are used in Risk management standards?

Standard – a rule or principle which is used as the basis for judgment of the risk management process, a series of checkpoints which an organisation should strive to achieve.

Risk – a potential consequence of an action. In recent developments in risk management, a risk can now be considered to be a negative or a positive consequence. A risk may or may not occur.

Management – the strategies which are implemented in an attempt to combat potential risk.

Emergency Response plan

Actions carried out immediately before, during, and immediately after a hazard impact, which are aimed at saving lives, reducing economic losses, and alleviating suffering.

Response actions may include activating the emergency operations center, evacuating threatened populations, opening shelters and providing mass care, emergency rescue and medical care, firefighting, and urban search and rescue.

The first step when developing an emergency response plan is to conduct a risk assessment to identify potential emergency scenarios. An understanding of what can happen will enable you to determine resource requirements and to develop plans and procedures to prepare your business. The emergency plan should be consistent with your performance objectives.

At the very least, every facility should develop and implement an emergency plan for protecting employees, visitors, contractors and anyone else in the facility. This part of the emergency plan is called “protective actions for life safety” and includes building evacuation (“fire drills”), sheltering from severe weather such as tornadoes, “shelter-in-place” from an exterior airborne hazard such as a chemical release and lockdown. Lockdown is protective action when faced with an act of violence.

When an emergency occurs, the first priority is always life safety. The second priority is the stabilization of the incident. There are many actions that can be taken to stabilize an incident and minimize potential damage. First aid and CPR by trained employees can save lives. Use of fire extinguishers by trained employees can extinguish a small fire. Containment of a small chemical spill and supervision of building utilities and systems can minimize damage to a building and help prevent environmental damage.

Some severe weather events can be forecast hours before they arrive, providing valuable time to protect a facility. A plan should be established and resources should be on hand, or quickly, available to prepare a facility. The plan should also include a process for damage assessment, salvage, protection of undamaged property and cleanup following an incident. These actions to minimize further damage and business disruption are examples of property conservation.

Protective Actions for Life Safety

When there is a hazard within a building such as a fire or chemical spill, occupants within the building should be evacuated or relocated to safety. Other incidents such as a bomb threat or receipt of a suspicious package may also require evacuation. If a tornado warning is broadcast, everyone should be moved to the strongest part of the building and away from exterior glass. If a transportation accident on a nearby highway results in the release of a chemical cloud, the fire department may warn to “shelter-in-place.” To protect employees from an act of violence, “lockdown” should be broadcast and everyone should hide or barricade themselves from the perpetrator.

Protective actions for life safety include:

- Evacuation
- Sheltering
- Shelter-In-Place
- Lockdown

Your emergency plan should include these protective actions. If you are a tenant in multi-tenanted building, coordinate planning with the building manager.

10 Steps for Developing the Emergency Response Plan

- Review performance objectives for the program.
- Review hazard or threat scenarios identified during the risk assessment.

- Assess the availability and capabilities of resources for incident stabilization including people, systems and equipment available within your business and from external sources.
- Talk with public emergency services (e.g., fire, police and emergency medical services) to determine their response time to your facility, knowledge of your facility and its hazards and their capabilities to stabilize an emergency at your facility.
- Determine if there are any regulations pertaining to emergency planning at your facility; address applicable regulations in the plan.
- Develop protective actions for life safety (evacuation, shelter, shelter-in-place, lockdown).
- Develop hazard and threat-specific emergency procedures using the Emergency Response Plan for Businesses.
- Coordinate emergency planning with public emergency services to stabilize incidents involving the hazards at your facility.
- Train personnel so they can fulfill their roles and responsibilities.
- Facilitate exercises to practice your plan.

Why have an emergency plan?

A definite plan to deal with major emergencies is an important element of OH&S programs.

Besides the major benefit of providing guidance during an emergency, developing the plan has other advantages. You may discover unrecognized hazardous conditions that would aggravate an emergency situation and you can work to eliminate them. The planning process may bring to light deficiencies, such as the lack of resources (equipment, trained personnel, supplies), or items that can be corrected before an emergency occurs. In addition, an emergency plan promotes safety awareness and shows the organization's commitment to the safety of workers.

The lack of an emergency plan could lead to severe losses such as multiple casualties and possible financial collapse of the organization.

Since emergencies will occur, preplanning is necessary. An urgent need for rapid decisions, shortage of time, and lack of resources and trained personnel can lead to chaos during an emergency. Time and circumstances in an emergency mean that normal channels of authority and communication cannot be relied upon to function routinely. The stress of the situation can lead to poor judgment resulting in severe losses. A well thought out, well organized emergency response plan will help to eliminate these issues.

What is the overall objective of the plan?

An emergency plan specifies procedures for handling sudden or unexpected situations. The objective is to be prepared to:

- Prevent fatalities and injuries.
- Reduce damage to buildings, stock, and equipment.
- Protect the environment and the community.

- Accelerate the resumption of normal operations.

Development of the plan begins with a vulnerability assessment. The results of the study will show:

- How likely a situation is to occur?
- What means are available to stop or prevent the situation?
- What is necessary for a given situation?

From this analysis, appropriate emergency procedures can be established.

At the planning stage, it is important that the relevant individuals or groups be asked to participate. Members of the team can include:

- employees with knowledge of the work
- supervisor of the area or work
- safety officer
- health and safety committee
- union representative, if applicable
- employees with experience in investigations
- "outside" experts
- representative from local government, police, fire, or ambulance

Where appropriate other organizations should also be consulted, especially when your organization's plan involves using outside resources, such as fire, police or ambulance. In some situations, one organization may develop shared response teams with neighbouring organizations.

In all situations, communication, training and periodic drills will help make sure the plan is executed well.

Note: In some cases, other authorities may have jurisdiction, such as if a serious injury or fatality occurred. Your organization should establish, implement, and maintain a procedure to coordinate managing incidents with the authority having jurisdiction (e.g., police, OH&S inspectors, etc.). This coordination may include the authority taking control of the incident scene.

What is the series of events or decisions that should be considered?

Having identified the hazards, the possible major impacts of each should be itemized, such as:

- Sequential events (for example, a fire after an explosion).
- Evacuation.
- Casualties.
- Damage to plant infrastructure.
- Loss of vital records/documents.
- Damage to equipment.

- Disruption of work.

Based on these events, the required actions are determined. For example:

- Declare emergency.
- Sound the alert.
- Evacuate danger zone.
- Close main shutoffs.
- Call for external aid.
- Initiate rescue operations.
- Attend to casualties.
- Fight fire.

Also consider what resources are required and their location, such as:

- Medical supplies.
- Auxiliary communication equipment.
- Power generators.
- Respirators.
- Chemical and radiation detection equipment.
- Mobile equipment.
- Emergency protective clothing.
- Firefighting equipment.
- Ambulance.
- Rescue equipment.
- Trained personnel.

What are the elements of the emergency plan?

The emergency plan includes:

- All possible emergencies, consequences, required actions, written procedures, and the resources available.
- Detailed lists of emergency response personnel including their cell phone numbers, alternate contact details, and their duties and responsibilities.
- Floor plans.
- Large scale maps showing evacuation routes and service conduits (such as gas and water lines).

Since a sizable document will likely result, the plan should provide staff members with separate written instructions about their particular emergency response duties.

The following are examples of the parts of an emergency plan. These elements may not cover every situation in every workplace but serve as a general guideline when writing a workplace specific plan:

Objective

The objective is a brief summary of the purpose of the plan; that is, to reduce human injury and damage to property and environment in an emergency. It also specifies those staff members who may put the plan into action. The objective identifies clearly who these staff members are since the normal chain of command cannot always be available on short notice. At least one of them must be on the site at all times when the premises are occupied. The extent of authority of these personnel must be clearly indicated.

Organization

One individual should be appointed and trained to act as Emergency Co-ordinator as well as a "back-up" co-ordinator. However, personnel on site during an emergency are key in ensuring that prompt and efficient action is taken to minimize loss. In some cases it may be possible to recall off-duty employees to help, but the critical initial decisions usually must be made immediately.

Specific duties, responsibilities, authority, and resources must be clearly defined. Among the responsibilities that must be assigned are:

- Reporting the emergency.
- Activating the emergency plan.
- Assuming overall command.
- Establishing communication.
- Providing medical aid.
- Alerting staff.
- Ordering response, including evacuation.
- Alerting external agencies, as necessary.
- Confirming evacuation is complete.
- Alerting outside population of possible risk, as necessary.
- Requesting external aid.
- Coordinating activities of various groups.
- Advising relatives of casualties.
- Providing medical aid.
- Ensuring emergency shut offs are closed.
- Sounding the all-clear.
- Advising media.

This list of responsibilities should be completed using the previously developed summary of responses for each emergency situation. Sufficient alternates for each responsible position must be named to ensure that someone with authority is available onsite at all times.

External organizations that may be available to assist (with varying response times) include:

- Fire departments.
- Mobile rescue squads.
- Ambulance services.
- Police departments.
- Telephone companies.
- Hospitals.
- Utility companies.
- Industrial neighbours.
- Government agencies.

These organizations should be contacted in the planning stages to discuss each of their roles during an emergency. Mutual aid with other industrial facilities in the area should be explored.

Pre-planned coordination is necessary to avoid conflicting responsibilities. For example, the police, fire department, ambulance service, rescue squad, company fire brigade, and the first aid team may be on the scene simultaneously. A pre-determined chain of command in such a situation is required to avoid organizational difficulties. Under certain circumstances, an outside agency may assume command.

Possible problems in communication have been mentioned in several contexts. Efforts should be made to seek alternate means of communication during an emergency, especially between key personnel such as overall commander, on-scene commander, engineering, fire brigade, medical, rescue, and outside agencies. Depending on the size of the organization and physical layout of the premises, it may be advisable to plan for an emergency control centre with alternate communication facilities. All personnel with alerting or reporting responsibilities must be provided with a current list of cell phone numbers and addresses of those people they may have to contact.

Procedures

Many factors determine what procedures are needed in an emergency, such as:

- Nature of emergency.
- Degree of emergency.
- Size of organization.
- Capabilities of the organization in an emergency situation.
- Immediacy of outside aid.
- Physical layout of the premises.

Common elements to be considered in all emergencies include pre-emergency preparation and provisions for alerting and evacuating staff, handling casualties, and for containing the hazards.

Natural hazards, such as floods or severe storms, often provide prior warning. The plan should take advantage of such warnings with, for example, instructions on sand bagging, removal of equipment to needed locations, providing alternate sources of power, light or water, extra equipment, and relocation of personnel with special skills. Phased states of alert allow such measures to be initiated in an orderly manner.

The evacuation order is of greatest importance in alerting staff. To avoid confusion, only one type of signal should be used for the evacuation order. Commonly used for this purpose are sirens, fire bells, whistles, flashing lights, paging system announcements, or word-of-mouth in noisy environments. The all-clear signal is less important since time is not such an urgent concern.

The following are "musts":

- Identify evacuation routes, alternate means of escape, make these known to all staff; keep the routes unobstructed.
- Specify safe locations for staff to gather for head counts to ensure that everyone has left the danger zone. Assign individuals to assist employees with disabilities.
- Carry out treatment of the injured and search for the missing simultaneously with efforts to contain the emergency.
- Provide alternate sources of medical aid when normal facilities may be in the danger zone.
- Ensure the safety of all staff (and/or the general public) first, then deal with the fire or other situation.

Testing and Revision

Completing a comprehensive plan for handling emergencies is a major step toward preventing disasters. However, it is difficult to predict all of the problems that may happen unless the plan is tested. Exercises and drills may be conducted to practice all or critical portions (such as evacuation) of the plan. A thorough and immediate review after each exercise, drill, or after an actual emergency will point out areas that require improvement. Knowledge of individual responsibilities can be evaluated through paper tests or interviews.

The plan should be revised when shortcomings have become known, and should be reviewed at least annually. Changes in plant infrastructure, processes, and materials used, and key personnel are occasions for updating the plan.

It should be stressed that provision must be made for the training of both individuals and teams, if they are expected to perform adequately in an emergency. An annual full-scale exercise will help in maintaining a high level of proficiency.

SAFETY AND SECURITY MEASURES IN ROOM DIVISIONS (HOUSEKEEPING)

Housekeeping in a hotel is a very physically demanding job. The personnel are on their feet for a full shift of 8 hours during which they perform various tasks that are demanding for the body. Housekeeping has the largest workforce in the hotel. It is therefore, imperative for the Housekeeper to ensure safe conditions and practices in the department.

Managers must train employees to recognize potentially hazardous conditions and take corrective actions before they cause injuries like sprains, strains, falls;

- Wet floors and slippery walkways

- Messy floors

- Equipment left out in the way

- Improper lifting techniques

Best practices for handling chemicals, proper personal protective equipment selection, material handling, and slip, trip, and fall prevention are discussed. Readers will gain an understanding of how to identify at-risk situations and how to avoid serious injury or illness.

Housekeepers are exposed to a variety of hazards while on the job and perform a variety of tasks throughout their work shift. Proper training to identify hazards and risks associated with these tasks will help prevent employee injury

Occupational Hazard

- Walking
- Standing
- Stooping
- Squatting
- Kneeling
- Stretching
- Twisting
- Crouching
- Lifting
- Pushing

The above are only sample situations where the body is under pressure. There are countless number of other situations that truly challenge housekeeping personnel.

Reducing the Physical Stress

The question then arises, how we reduce the physical stress on housekeeping personnel. The following suggestions are useful to keep in mind.

1. Lighter equipment can reduce work. Heavy equipment must be on castors. Portability helps greatly in work management.
2. Modern Detergents help in cleaning with a swipe that may eliminate tedious scrubbing.
3. Job Rotation
4. Team Work.
5. Education and Training in safe work practices must be part of ongoing agenda.

Work Hazards and Prevention.

Let us examine the areas in housekeeping operation when accidents take place:

Falls from slippery floors make shift ladders: Put the sign "Wet Floor" this protects both the guest and staff. Ladders must be stable and strong, use aluminum ladders with rubber footing to prevent slippage. It is preferable to have someone holding the ladder from below. Employees must be prevented from using make shift ladders like packing crates and chairs.

Cuts from broken glass in linen bundles and garbage: Any heap of linen or garbage is a potential hazard for broken glass or exposed syringes. The cleaners must not put their hands in garbage heaps. Room dustbins must be emptied enmass into the garbage hamper. Room attendant shake the soiled linen for guest belongings, which is a good precaution as it ensures that broken glass or other sharp objects are not hidden in folds.

Back Pains from improper working postures: Back pains are a common complaint due to the pressure on their backs while doing their daily chores. The secret is to keep the correct posture. Correct posture balances the neck, chest and lower back. Back pains are caused due to lifting, bend at the knees and not at the waist. Use both hands while lifting and hold the items closer to the body.

Breathing problems and burns from the use of hazardous chemicals and detergents: Housekeepers normally use mild detergents for daily use. However potent chemicals like acids and potent detergents are unavoidable. Exposure to these chemicals cause nausea, allergy, burns vomiting breathing problems, skin rashes etc. Cleaners must be trained in the safe use of these chemicals. Suppliers often provide the training and safety manual in the use of these chemicals. Cleaners must be provided with goggles, gloves and masks for operations that involve the use of hazardous chemicals.

Electrocution from live electric wires and improper maintenance and use of equipment: Housekeeper must ensure the equipment she buys has the ISI stamp of safety. Employees are properly trained in the use of the equipment. The manufactures are the best people to provide the training. Machines with loose/ open wires/ broken plugs should not be used. When not in use the wires of the vacuum cleaner should be neatly rolled and placed with the machine.

Never operate electrical equipment with wet hands or cloths

Do not operate near flammable liquids, chemicals or vapors

Turn off them when sparks, smokes or flames are seen

Check the wires and connections periodically

Never unplug them by pulling the cord

Keep the cords out off traffic areas

When cleaning guestrooms, room attendants should check for frayed wires, loose connections, loose plugs, broken switches

Injuries due to improper work habits: Smoke only in designated area, never in the elevator. Ensure elevators are never overloaded. Use the correct equipment and accessories for cleaning. Use accessories like gloves, goggles, masks when dealing with toxic material. Look for broken glass when cleaning. Do not put bare hands into trashcans for they might get cuts by glass pieces or razor blades. Use handrails while climbing steps. Untangle cords of equipment before use and keep them away from pathways. Report on safety hazards if you cannot rectify. Rely on maintenance to complete fixing jobs. Check equipment for their serviceability.

Working at height: Any work which is carried above 5ft height requires a ladder. The ladder should be an A line ladder with the rubber shoes of the ladder intact and the center support in working condition.

Always use safety helmet and safety belt while working at height. The area should be cordoned off.

Ladders; when selecting a ladder inspect its condition, height and footing.

- Do not use broken or defective ladder
- Do not use aluminum or metal ladder when working near or on electrical equipment
- Use rubber footing on tile floors and in kitchen
- Floor must be dry and clean
- Should be high enough
- Never stand on the top step
- Never place a ladder against a window or uneven surfaces
- Should be well-balanced
- When climbing, face the ladder and have clean and dry hands and feet
- Mark the area underneath the ladder with caution signs

Housekeepers Responsibilities towards safety are: -

1. Prepare a safety manual that is read and understood at the time of induction of new employees.
2. Paste safety rules on walls at strategic points in the work area.
3. Reinforce safety rules in daily briefings.
4. Organize continuous safety training. Involve experts like the equipment manufacturers, Engineering to take classes on fire safety etc.
5. Have a Preventive maintenance programmed for all equipment.
6. Include safety inspection in the supervisor's checklist.
7. Ensure that toxic chemicals are stored in closed cupboards and properly labeled.
8. Ensure that all waste disposal containers are leak proof and maintained in sanitary conditions. Waste disposal external to the building must be in designated municipal area and with concern for public health. The recycled items are put in their appropriate containers.

9. Make sure that locker rooms have proper washing and shower facilities. Locker rooms must be kept clean and dry at all times. Water closets must be sanitized frequently.
10. Ensure that housekeeping employees consume food and beverage in the staff canteens and not in public areas.
11. Ensure rest breaks for employees during their shift vigil.
12. Keep appropriate signs like “Wet Floor”; “Engineering at Work”, labels for detergents and toxic material, safety instructions on equipment, “
13. Not to stack anything in the corridors.
14. Fire exit staircase should always be clear, not to stack items which will obstruct the movement.
15. Ensure hot and cold indicators on the tap faucets.
16. In the rooms and corridor’s few lights should be connected to UPS.
17. Swimming pool pH and chlorine levels to be maintained.
18. Pool area no diving signage to be painted.
19. Bed corner to be covered.
20. Non - smoking zone signage.
21. Safety shoes for Engineering and Kitchen and Gum boots for Kitchen Stewarding.
22. Smoke detectors indicator light to blink at all the times.

First Aid

It is important for all housekeeping personnel to know about first aid as they could be the first ones on the spot to give immediate attention to a guest or an employee. It is a part of the overall Safety Programme.

The first step is to have a first aid cupboard or box in all the departments.

The cupboard should contain the following items:

- Clinical thermometer
- Cotton wool
- Bandage roll
- Band aids
- Sterilized gauze

- Rubber sheeting
- Tincture iodine
- Dettol
- Burn-ol
- Croc in tablets
- Aspirins
- Mercurochrome
- Antiseptic cream

SECURITY IN HOUSEKEEPING

We know that housekeeping personnel are spread across the hotel in pursuit of their cleaning and maintenance duties. They therefore become the ideal 'eyes and ears' of the organization to detect any security threats to the organization. The main security concerns are:

- Lost and Found
- Guest Theft
- Employee theft
- Bomb Scare.
- Guest Theft

Guest takes hotel items as souvenirs. The hotel may not mind things like soaps and stationary are taken as the hotel may build such costs into the room rate. But items as towels and bathrobes are a serious concern because of their cost to replace them.

Housekeeping personnel take the following precaution:

- Key Control: Limited access to guest rooms.
- Suspicious Movements: Housekeeping personnel are trained to observe suspicious movements and report to security.
- Departure Procedure: Train bellboys to give a quick glance at the room and bathroom before they remove guest baggage.
- Standard Issues to Guest rooms: The ability to detect missing items is made possible by equipping rooms with standard number of items.
- Entry/Exit point: A guest room has only one entry/exit door. Windows are secure. Room doors are provided with peepholes.

WHAT THE HOUSEKEEPING DEPARTMENT CAN DO

No other hotel employee has as much access to hotel assets and guest property as the members of the housekeeping department. No one is more sensitive to the problems of theft from hotel guestrooms than the honest attendant who is known to possess a floor master key to a guestroom that has just been robbed. There is this assumption that, because housekeeping has a key to the room, if anything is missing, the department is by default the culprit, but there are instances when thefts have been triggered from within the housekeeping employees. Housekeeping personnel have reach to all the areas of the hotel and have maximum knowledge of guest areas and public areas. Any terror activity can easily be planned in a hotel if one has help from the housekeeping department.

Employee Theft: As in the case of the guest, employees find that most of the items are useful at home. A hotel reduces pilferage by adopting the following precaution.

Gate Pass: An employee is required to posses a gate pass, issued and authorized by the head of the department whenever a hotel property is removed from the hotel.

Spot Check: Security personnel conduct spot checks, of employee's handbags at random to ensure that unauthorized items are not being taken out of the hotel. Staff lockers are checked periodically. Uniforms are not permitted outside the property.

Limited Access: Employees have limited access to areas of the hotel. For example the engineering personnel can enter the room along with a room attendant; a cook cannot go up on the floor. Every department has specific uniform, and designated areas of work that limits them to their area of work. Only certain personnel are expected to go up to the guest floors. Another aspect of limited access is the authority to enter stores. The storekeeper and the helpers are permitted to enter the stores and are accountable for items received and issued.

Par Stocks: Room attendants have par stocks of items on their maid cart that have to be accounted for. Similarly, guest rooms have par stocks, where the room attendants are accountable for a set of rooms and they have to ensure the par stocks are maintained.

Bomb Threats: Terrorism is a concern for all public buildings. Hotels are prime targets. Housekeeping personnel are trained to report on suspicious objects, drugs, and excess money lying in the room, arms and bomb like structures to the security.

CASE STUDY:-

Center for Strategic Analysis and Research (referred here to as CSAR) has taken up this national task and find out a mathematical model for the analysis and evaluation of crisis management.

According to the dates of terror attack plotted against the places of attack on – a logical trajectory was observed which had a uniform angle of 26 degrees and the hyperbola was lying on Visakhapatnam when the trajectory was extrapolated on wider scale the probable target with linear terrorist operation were found to be LUCKNOW/ KANPUR and GOA/ PANAJI with the striking

dates as January 13 and March 26 respectively. The hyperbola falling on Visakhapatnam reveals the bitter truth that a submarine of Pakistani origin was torpedo in the Jet by INDIAN Forces.

The submarine PNS GHAZI was located in beneath the Visakhapatnam during the Bangladesh Liberation War and that was destroyed by INS RAJPUT. To avenge the ruthless defeat at the hands of INDIAN forces in 1971, the Pakistani army has developed a well-planned trajectory to demonstrate its military might with a clear demonstration of their covering the entire INDIAN area.

On 26 November, 2008, the world experienced the most publicized sudden crisis, which was outbreak of anti-social activity against common people of India. Total 183 people lost their lives and 314 were seriously injured in almost three days of terror that unleashed on Mumbai starting 26 November 10 attackers.

At the same time Indian Government was blamed by foreign government, international organizations & international press for being reluctant to admit the outbreak of terror attack. Why??..... One criticism was that the police force on the ground had World War II guns and that the bullet-proof jackets of the force were sub-standard. That's why we saw so many casualties in the police force.

Modernization of the force is the need of the hour and should be at the top priority So we need specialized teams in the police force to deal with such situations. But one must understand that policemen and officers from nearest police stations will be the first ones to reach the spot and will be the first in the firing line.

On bullet-proof jackets, I'd like to point out that there is no bullet-proof jacket that can stop a bullet fired from .303 rifles. In the case of modern assault rifles, if one gets hit from 10 metres, then too the bullet can pierce the shield.

In the case of ATS chief Hemant Karkare, the bullet hit his throat, which is not protected by any jacket, Additional Commissioner Ashok Kamate was not wearing the jacket as it hampers mobility. Only in the case of Senior Inspector Vijay Salaskar did the bullet pierce his bulletproof jacket.

The Intelligence Bureau has confirmed that the attacks that took place in Mumbai on 26 Nov, 2008 might were an act of terror and aimed at disrupting peace and causing panic among Mumbaikers.

The reason for IB to say that the terror attack is due to fact that operation was synchronized also it was a serial firing and apart from security personal only terrorist had access to AK-47 rifles. Also the purpose of this retrospective study is to examine the Indian Government’s role in crisis management during this terror attack.

Safety and Security management success stories:-

Mumbai

In 2008, 26 November, 9 terrorists attacked Taj hotel, Oberoi Hotel and Nariman House at Mumbai and killed almost 200 people and about 300 were seriously injured in these three places. It took three days for NSG commandos to overcome these terrorist. In the three days long fight, the commandos were able to kill 8 terrorists and captured one injured. Despite the terror attack, the basic feature of Mumbai as a safe and secure city for everyone, whether he is living in a slum or is the CEO of a corporate giant, has not changed.

Parents in the city don't worry about their young professional daughters coming home late at night in public transport. Having said that, there is no guarantee that this -- a better law-andorder situation in the city compared with other metros -- will protect you from a terror attack.

Tylenol (Johnson and Johnson)

In the fall of 1982, a murderer added 65 milligrams of cyanide to some Tylenol capsules onstore shelves, killing seven people, including three in one family. Johnson & Johnson recalled and destroyed 31 million capsules at a cost of $100 million. The affable CEO, James Burke, appeared in television ads and at news conferences informing consumers of the company's actions. Tamper-resistant packaging was rapidly introduced, and Tylenol sales swiftly bounced back to near pre-crisis levels (Dezenhall, 2004).

Johnson & Johnson was again struck by a similar crisis in 1986 when a New York woman died on Feb. 8 after taking cyanide-laced Tylenol capsules. Johnson & Johnson was ready. Responding swiftly and smoothly to the new crisis, it immediately and indefinitely canceled all television commercials for Tylenol, established a toll-free telephone hot-line to answer consumer questions and offered refunds or exchanges to customers who had purchased Tylenol capsules. At week's end, when another bottle of tainted Tylenol was discovered in a store, it took only a matter of minutes for the manufacturer to issue a nationwide warning that people should not use the medication in its capsule form (Rudolph, 1986).

Odwalla Foods

When Odwalla's apple juice was thought to be the cause of an outbreak of E. coli infection, the company lost a third of its market value. In October 1996, an outbreak of E. coli bacteria in Washington State, California, Colorado and British Columbia was traced to unpasteurized apple juice manufactured by natural juice maker Odwalla Inc. Forty-nine cases were reported, including the death of a small child. Within 24 hours, Odwalla conferred with the FDA and

Washington state health officials; established a schedule of daily press briefings; sent out press releases which announced the recall; expressed remorse, concern and apology, and took responsibility for anyone harmed by their products; detailed symptoms of E. coli poisoning; and explained what consumers should do with any affected products. Odwalla then developed -

through the help of consultants - effective thermal processes that would not harm the products' flavors when production resumed. All of these steps were communicated through close relations with the media and through full-page newspaper ads (Dwyer, 1998).

Mattel

Mattel Inc., the country's biggest toy maker, has been plagued with more than 28 product recalls and in Summer of 2007, amongst problems with exports from China, faced two product recall in two weeks. The company “did everything it could to get its message out, earning high marks from consumers and retailers. Though upset by the situation, they were appreciative of the company's response. At Mattel, just after the 7 a.m. recall announcement by federal officials, a public relations staff of 16 was set to call reporters at the 40 biggest media outlets.

They told each to check their e-mail for a news release outlining the recalls, invited them to a teleconference call with executives and scheduled TV appearances or phone conversations with Mattel's chief executive. The Mattel CEO Robert Eckert did 14 TV interviews on a Tuesday in August and about 20 calls with individual reporters. By the week's end, Mattel had responded to more than 300 media inquiries in the U.S. alone” (Goldman and Reckard, 2007).

Lessons learned in crisis management

Impact of Catastrophes on Shareholder value One of the foremost recognized studies conducted on the impact of a catastrophe on the stock value of an organization was completed by Dr Rory Knight and Dr Deborah Pretty, (1995, Templeton College, University of Oxford - commissioned by the Sedgewick Group). This undertook a detailed analysis of the stock price, (post impact), of organizations that had experienced catastrophes. The study identified organizations that recovered and even exceeded pre-catastrophe stock price, (Recoverers), and those that did not recover on stock price, (Nonrecoverers). The average cumulative impact on shareholder value for the recoverers was 5% plus on their original stock value. So the net impact on shareholder value by this stage was actually positive. The non-recoverers remained more or less unchanged between days 5 and 50 after the catastrophe, but suffered a net negative cumulative impact of almost 15% on their stock price up to one year afterwards. One of the key conclusions of this study is that "Effective management of the consequences of catastrophes would appear to be a more significant factor than whether catastrophe insurance hedges the economic impact of the catastrophe".

While there are technical elements to this report it is highly recommended to those who wish to engage their senior management in the value of crisis management

Bhopal

The Bhopal disaster in which poor communication before, during, and after the crisis cost thousands of lives, illustrates the importance of incorporating cross-cultural communication in crisis management plans. According to American University’s Trade Environmental Database Case Studies (1997), local residents were not sure how to react to warnings of potential threats from the Union Carbide plant. Operating manuals printed only in English is an extreme example of mismanagement but indicative of systemic barriers to information diffusion.

According to Union Carbide’s own chronology of the incident (2006), a day after the crisis Union Carbide’s upper management arrived in India but was unable to assist in the relief efforts because they were placed under house arrest by the Indian government. Symbolic intervention can be

counter productive; a crisis management strategy can help upper management make more calculated decisions in how they should respond to disaster scenarios.

The Bhopal incident illustrates the difficulty in consistently applying management standards to multi-national operations and the blame shifting that often results from the lack of a clear management plan (Shrivastava, 1987).

Ford and Firestone Tire and Rubber Company

The Ford-Firestone dispute transpired in August 2000. In response to claims that their 15-inch Wilderness AT, radial ATX and ATX II tire treads were separating from the tire core—leading to grisly, spectacular crashes—Bridgestone/Firestone recalled 6.5 million tires. These tires were mostly used on the Ford Explorer, the world's top-selling sport utility vehicle (SUV) (Ackman, 2001).

The two companies' committed three major blunders early on, say crisis experts. First, they blamed consumers for not inflating their tires properly. Then they blamed each other for faulty tires and faulty vehicle design. Then they said very little about what they were doing to solve a problem that had caused more than 100 deaths—until they got called to Washington to testify before Congress (Warner, 2002).

Exxon

On March 24, 1989, a tanker belonging to the Exxon Corporation ran aground in the Prince William Sound in Alaska. The Exxon Valdez spilled millions of gallons of crude oil into the waters off Valdez, killing thousands of fish, fowl, and sea otters. Hundreds of miles of coastline were polluted and salmon spawning runs disrupted; numerous fishermen, especially Native Americans, lost their livelihoods. Exxon, by contrast, did not react quickly in terms of dealing with the media and the public; the CEO, Lawrence Rawl, did not become an active part of the public relations effort and actually shunned public involvement; the company had neither a communication plan nor a communication team in place to handle the event—in fact, the company did not appoint a public relations manager to its management team until 1993, 4 years after the incident; Exxon established its media center in Valdez, a location too small and too remote to handle the onslaught of media attention; and the company acted defensively in its response to its publics, even laying blame, at times, on other groups such as the Coast Guard. These responses also happened within days of the incident (Pauly and Hutchison, 2005).

Public sector crisis management

India, America, is not the only community that is vulnerable to the perils of a crisis. Whether a terrorist attack, a school shooting, a public health crisis or that leaves the public seeking comfort in the calm, steady leadership of an elected official, no sector of society is immune to crisis. In response to that reality, crisis management policies, strategies and practices have been developed and adapted across multiple disciplines.

Government and crisis management

Historically, government at all levels – local, state, and national – has played a large role in crisis management. Indeed, many political philosophers have considered this to be one of the primary roles of government. Emergency services, such as fire and police departments at the local level, and the United States National Guard at the federal level, often play integral roles in crisis situations.

To help coordinate communication during the response phase of a crisis, the U.S. Federal Emergency Management Agency (FEMA) within the Department of Homeland Security administers the National Response Plan (NRP). Similarly in India. ATS (Anti Terrorist Squad) is there to fight and protect the nation against the terrorism. This plan is intended to integrate public and private response by providing a common language and outlining a chain-ofcommand when multiple parties are mobilized. It is based on the premise that incidences should be handled at the lowest organizational level possible. FEMA offers free web-based training on the National Response Plan through the Emergency Management Institute.

The Disasters Management Act, 2005, India

The Disaster Management Act was passed by the Lok Sabha on December 12 2005, and by the Rajya Sabha on 28november 2005. It received the assent of the President of India on 2005 December 23. The Act calls for the establishment of a National Disaster Management Authority (NDMA), with the Prime Minister of India as chairperson. The NDMA has no more than nine members at a time, including a Vice-Chairperson. The tenure of the members of the NDMA is 5 years. The NDMA which was initially established on 30 May 2005 by an executive order, was constituted under Section-3(1) of the Disaster Management Act, on 27 September 2005. The NDMA is responsible for "laying down the policies, plans and guidelines for disaster management and to ensure a very timely and effective response to the disaster". Under section 6 of the Act it is responsible for laying "down guidelines to be followed by the State Authorities in drawing up the country Plans".

Disaster Management Plan

On 1 June 2016, Pranab Mukherjee, the Ex President of India, launched the Disaster Management Plan of India, which seeks to provide help and direction to the agencies for prevention, mitigation and management of disasters. This is the first plan nationally since the enactment of the Disaster Management Act of 2005.

About the Authority

National Disaster Management Authority (India) is an agency of the Ministry of Home Affairs whose primary purpose is to coordinate response to natural and for capacity-building in disaster resiliency and crisis response.NDMA was established through the Disaster Management Act enacted by the Government of India in December 2005. The Prime Minister is the ex-officio chairperson of NDMA. The agency is responsible for framing policies, laying down guidelines

and best-practices and coordinating with the State Disaster Management Authorities (SDMAs) management.

National Policy on Safety, Health and Environment at Workplace (NPSHEW) On the basis of Directive Principles as well as international instruments the Government of India, Ministry of Labour & Employment, had declared the National Policy on Safety, Health and Environment at Workplace (NPSHEW) on 20th February, 2009 and the policy document has been posted in the website of the Ministry of Labour and Employment

Occupational Safety and Health is one of the subjects allotted to Ministry of Labour & Employment under the Government of India

Directorate General Factory Advice Service and Labour Institutes The DGFASLI setup in 1945 is an attached office of the Ministry of Labour & Employment, Government of India and serves as a technical arm to assist the Ministry in formulating national policies on occupational safety and health in factories and docks. It also advises factories on various problems concerning safety, health, efficiency and well - being of the persons at work places.

Introduction and Basics about Disasters

What is a Disaster?

- A disaster is a result of natural or man-made causes that leads to **sudden disruption of normal life,** causing severe damage to life and property to an extent that available social and economic protection mechanisms are inadequate to cope.

- It is an **undesirable occurrence** resulting from forces that are largely outside human control. It strikes quickly with little or no warning and requires major efforts in providing statutory emergency service.

Classification of Disasters

- Disasters are classified as per origin, into natural and man-made disasters. **As per severity,** disasters are classified as minor or major (in impact).

- **Natural disasters are sudden ecological disruptions** or threats that exceed the adjustment capacity of the affected community and require external assistance.

- Natural disasters can be broadly classified into categories including **geophysical** such as earthquakes and volcanic eruptions; **hydrological** such as floods; **meteorological** such as hurricanes; **climatological** such as heat and cold waves and droughts; and **biological** such as epidemics.

- Man-made disasters can include hazardous material spills, fires, groundwater contamination, transportation accidents, structure failures, mining accidents, explosions and acts of terrorism.

Causes for Occurrence of Disaster

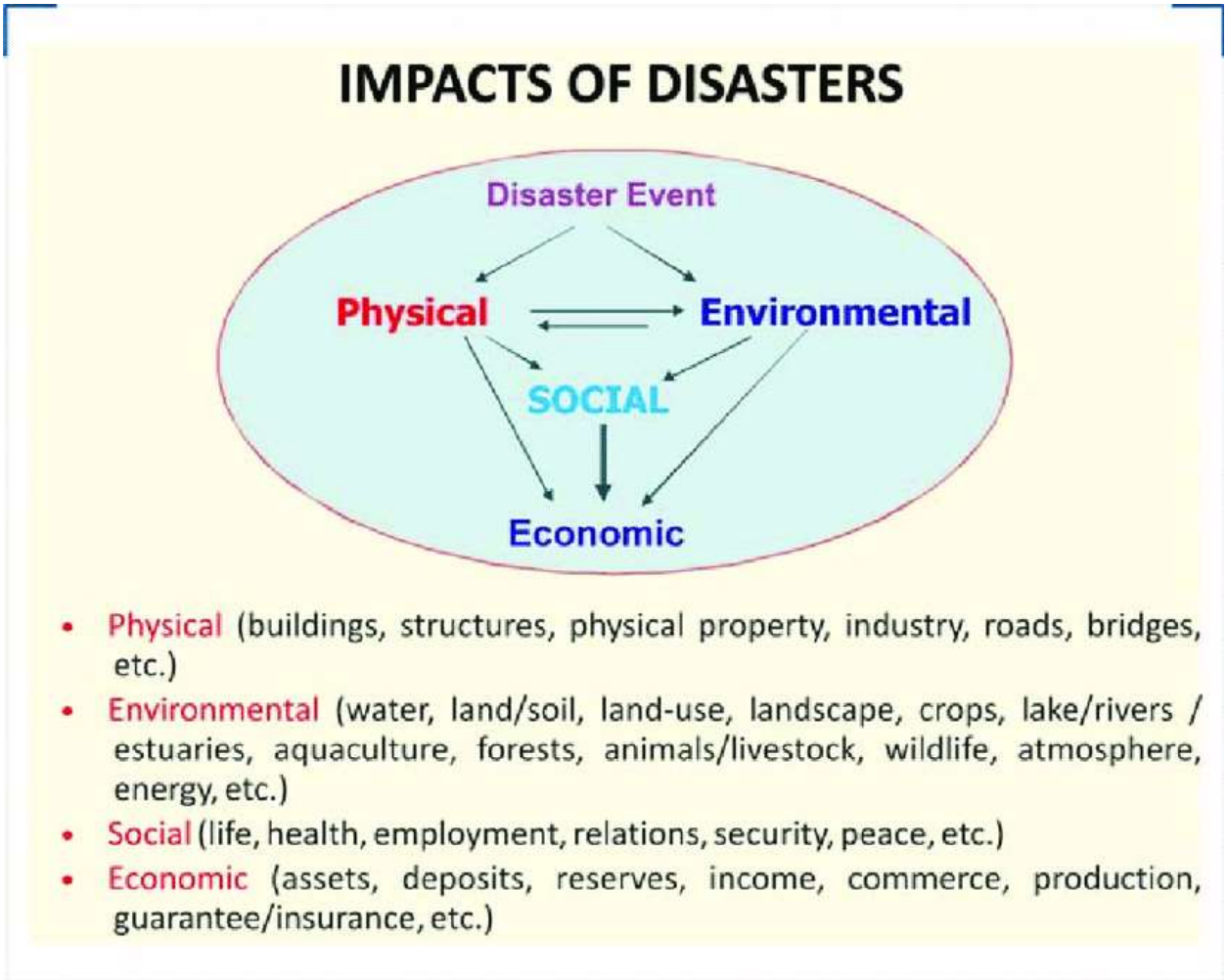
- **Environmental degradation:** Removal of trees and forest cover from a watershed area have caused, soil erosion, expansion of flood plain area in upper and middle course of rivers and groundwater depletion.

- **Developmental process:** Exploitation of land use, development of infrastructure, rapid urbanization and technological development have caused increasing pressure over the natural resources.

- **Political issues:** War, nuclear power aspirations, fight between countries to become super power and conquering land, sea and skies. These have resulted into wide range of disaster events such as Hiroshima nuclear explosion, Syrian civil war, growing militarisation of oceans and outer space.

- **Industrialization:** This has resulted into warming of earth and frequency of extreme weather events has also increased.

Impacts of Disaster



- Disaster **impacts individuals physically** (through loss of life, injury, health, disability) as well as **psychologically**.
- Disaster results in **huge economic loss** due to destruction of property, human settlements and infrastructure etc.
- Disaster **can alter the natural environment**, loss of habitat to many plants and animals and cause ecological stress that can result in biodiversity loss.
- After natural disasters, food and other natural resources like water often becomes scarce resulting into **food** and **water scarcity**.

- The disaster results in **displacement of people**, and displaced population often face several challenges in new settlements, in this process poorer becomes more poor.

- Disaster **increases the level of vulnerability** and hence multiply the effects of disaster.

Vulnerability Profile of India

- India is vulnerable, in varying degrees, to a large number of disasters. **Around 59% of the landmass is prone to earthquakes** of moderate to very high intensity.

- **About 12% (over 40 million hectares) of its land is prone to floods and river erosion.**

- Close to 5,700 kms, out of the 7,516 kms **long coastline is prone to cyclones and tsunamis**.

- **68% of its cultivable area is vulnerable to droughts;** and, the **hilly areas are at risk from landslides and avalanches**.

- Moreover, India is also **vulnerable to chemical, biological, radiological and nuclear (CBRN) emergencies** and other man-made disasters.

- Disaster risks in India are further compounded by increasing vulnerabilities related to **changing demographics and socio-economic conditions, unplanned urbanization,** development within high-risk zones, **environmental degradation, climate change, geological hazards, epidemics and pandemics**.

- Clearly, all these contribute to a situation where disasters seriously threaten India's economy, its population and sustainable development.

Worst Disasters in India

- **Kashmir Floods (2014)** affected Srinagar, Bandipur, Rajouri etc. areas of J&K have resulted into death of more than 500 people.

- **Uttarakhand Flash Floods (2013)** affected Govindghat, Kedar Dome, Rudraprayag district of Uttarakhand and resulted into death of more than 5,000 people.

- **The Indian Ocean Tsunami (2004)** affected parts of southern India and Andaman Nicobar Islands, Sri Lanka, Indonesia etc., and resulted in the death of more than 2 lakh people.

- **Gujarat Earthquake (2001)** affected Bhuj, Ahmedabad, Gandhinagar, Kutch, Surat, Surendranagar, Rajkot district, Jamnagar and Jodia districts of Gujarat and resulted in death of more than 20,000 people.

- **Odisha Super Cyclone or Paradip cyclone (1999)** affected the coastal districts of Bhadrak, Kendrapara, Balasore, Jagatsinghpur, Puri, Ganjam etc., and resulted into death of more than 10,000 people.

- **The Great Famine (1876-1878)** affected Madras, Mysore, Hyderabad, and Bombay and resulted into death of around 3 crore people. Even today, it is considered as one of the worst natural calamities in India of all time.

- **Coringa Cyclone (1839)** that affected Coringa district of Andhra Pradesh and **Calcutta Cyclone (1737)** are some other instances of natural calamities faced by the country in the past.

- **The Bengal Famine** in the years **1770** and **1943** affected Bengal, Odisha, Bihar very badly and resulted into death of nearly 1 crore people.

- **Bhopal Gas tragedy (December, 1984)** is one of the worst **chemical disasters** globally that resulted in over 10,000 losing their lives (the actual number remains disputed) and over 5.5 lakh persons affected and suffering from agonizing injuries.

- **In recent times, there have been**

    - **cases of railway accidents** (Dussehra gathering on the railway tracks crushed by the trains in 2018),

    - **fire accidents in hospitals** due to negligence and non implementation of existing mandatory fire safety norms,

    - **collapse of various infrastructure constructs like flyovers, metro tracks and residential buildings** due to poor quality of

construction, illegal addition of floors and recurring floods.

- **Stampede at large public gathering** like Kumbh Mela caused by poor people management and lack of adequate infrastructure to monitor and manage large crowd gathering.

Stages in Disaster Management

- Disaster Management efforts are geared towards **disaster risk management**.
- Disaster Risk Management implies the systematic **process of using administrative decisions, organisation, operational skills, and capacities to implement policies, strategies and coping capacities** of the society and communities to lessen the impact of natural hazards and related environmental and technological disasters.
- These comprise all forms all activities including structural and non-structural measures to avoid (prevention) or to limit (mitigation and preparedness) adverse effects of hazards.

There are Three key Stages of Activities in Disaster Management:

1. **Before a disaster:** to reduce the potential for human, material, or environmental losses caused by hazards and to ensure that these losses are minimised when disaster strikes;
2. **During a disaster:** to ensure that the needs and provisions of victims are met to alleviate and minimise suffering;
3. **After a disaster:** to achieve rapid and durable recovery which does not reproduce the original vulnerable conditions.

   The different phases of disaster management are represented in the disaster cycle diagram

Disaster Risk Reduction (DRR)

- Disaster risk reduction is the concept and practice of reducing disaster risks through systematic efforts to analyse and reduce the causal factors of disasters.
- **Pre-Disaster Risk Reduction Includes-**
    - **Mitigation:** To eliminate or reduce the impacts and risks of hazards through proactive measures taken before an emergency or disaster occurs.
    - **Preparedness:** To take steps to prepare and reduce the effects of disasters.
- **Post-Disaster Risk Reduction Includes-**
    - **Rescue:** Providing warning, evacuation, search, rescue, providing immediate assistance.

- **Relife:** To respond to communities who become victims of disaster, providing relief measures such as food packets, water, medicines, temporary accommodation, relief camps etc.

- **Recovery:** This stage emphasises upon recovery of victims of disaster, recovery of damaged infrastructure and repair of the damages caused.

Disaster Risk Reduction in Sustainable Development Goals

- **Goal 1:** Target 1.5, which relates to building the resilience of the poor, further strengthens the position of disaster risk reduction as a core development strategy for ending extreme poverty.

- **Goal 2:** Target 2.4 supports the immediate need to advance actions in mainstreaming disaster risk reduction and **climate adaptation into agriculture sector planning** and investments in order to promote resilient livelihoods, food production and ecosystems.

- **Goal 3:** Target 3.d, relates to **strengthening early warning and risk reduction of national and global health risks** presents an opportunity to further actions to promote resilient health.

- **Goal 4:** Target 4.7 focusing on building and upgrading education facilities and **promoting education** for sustainable development, contribute significantly to resilience-building in the education sector.'

- **Goal 6:** Target 6.6, which relates to **protecting and restoring water-related ecosystems**, will significantly contribute to strengthening the resilience of communities to water-related hazards.

- **Goal 9:** Targets 9.1 related to **developing sustainable and resilient infrastructure development** are vital not only to protect existing infrastructure but also future infrastructure investments.

- **Goal 11:** Action targets under this goal (11.1, 11.3, 11.4, 11.5, 11.b and 11.c) focusing on upgrading urban slums, integrated urban planning, reducing social and economic impacts of disaster risk, **building the resilience of the urban poor, adopting and implementing urban policies in line with the Sendai Framework** and building sustainable and resilient urban infrastructure, are strategic opportunities to ensure increased capacity to support cities, to protect current and future development prospects and to build safer, more resilient cities throughout the world.

- **Goal 13:** Target actions under this goal, focusing on **strengthening resilience and adaptive capacity**, capacity building and integrating climate change measures into policies and plans, awareness raising on climate adaptation and early warning (Targets 13.1 to 13.3 and 13.a to 13.b) provide opportunities to **strengthen the integration between disaster and climate resilience** and to protect broader development paths at all levels.

- **Goal 14:** Target action 14.2, focusing on the sustainable management and protection as well as **strengthening resilience of marine and coastal ecosystems,** can contribute to reducing disaster risk and increase in demand for healthy marine and coastal ecosystems.

- **Goal 15:** Target actions 15.1 to 15.4 and 15.9, focus on **managing and restoring forests**, combating land degradation and desertification, conserving mountain ecosystems and their biodiversity and integrating ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies.

- **These targets are also in line with the Sendai Framework** focus on building environmental resilience through the inclusion of ecosystems in risk analysis and planning.

Challenges in Disaster Risk Reduction

- There are **insufficient levels of implementation** for each monitored activity. For example, Disaster risk management plans or a risk sensitive building codes exist but they are not enforced because of a lack of government capacity or public awareness.

- There is **lack of local capacities** to implement disaster risk management. Weak capacity at the local levels undermines the implementation Disaster preparedness plans.

- **Absence of integration of climate change into Disaster risk management plans.**

- There is **divergence of obtaining political and economic commitments** due to other competing needs and priorities such as poverty reduction, social welfare, education etc. require greater attention and funding.

- **Due to poor coordination between stakeholders,** there is inadequate access with respect to risk assessment, monitoring, early warning, disaster response and other Disaster related activities.
- **Insufficient investment in building disaster resilient strategies,** also private sector are least contributors in the share of investment.