DIPLOMA IN DISASTER MANAGEMENT

DDM-1

Introduction to Disaster Management

Block

1

Unit – 1

Hazard, Risk, Vulnerability and Disaster

Unit – 2

Meaning, Nature, Importance, Dimensions and Scope of Disaster Management

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Disaster Management Cycle

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DIPLOMA IN DISASTER MANAGEMENT

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Unit – 1

Introduction to Disaster Management

Learning Objectives:

After completion of this unit, you should be able to:

- *describe disaster, hazard, risk & vulnerability.*
- *describe difference between hazard and disaster.*
- *discuss disaster management meaning, scope and approaches.*
- *analyze disaster management cycle.*

Structure:

1.1. Introduction:

Do you all know that earth is always in a dynamic state of equilibrium? Therefore, everything on this earth has a tendency to shift from a

stressed state to less stressed one. Likewise earthquakes, landslides, cyclones, tsunamis etc. are the **natural phenomenon** that occur on earth to attain equilibrium. During this process they sometimes affect the human lives and property and then they become **natural hazards**. But when they cause a serious disruption in the functioning of the community or a society causing widespread material, economic, social or environmental losses which exceed the ability of the affected society to cope using its own resources they become **natural disasters**.

Examples can be given like an earthquake in an uninhabited desert cannot be considered a disaster, no matter how strong the intensities are produced. An earthquake is disastrous only when it affects people, livestock, properties, and infrastructure and livelihood activities.

1.2. Disaster:

The 'Disaster' owes its origin to the French word 'Desastre' which is the combination of the article - 'des' and 'astre' meaning 'star'. In earlier days a disaster was considered to be due to some unfavorable star. Nowadays, the term Disaster' is commonly used to denote ally odd event, be natural or manmade, which brings about immense misery to a region. So that it becomes difficult to cope with the situation through local resources.

A situation of hardship and human suffering arising from events which causes physical loss or damage, social and /or economic disruption from which the country or community is unable to fully cope alone. The situation may occur slowly or suddenly making normal life abnormal. The coping mechanism does not work without external support.

Natural disasters – floods, cyclones, landslides and avalanches, droughts, earthquakes, heat waves, fires, tsunami etc.

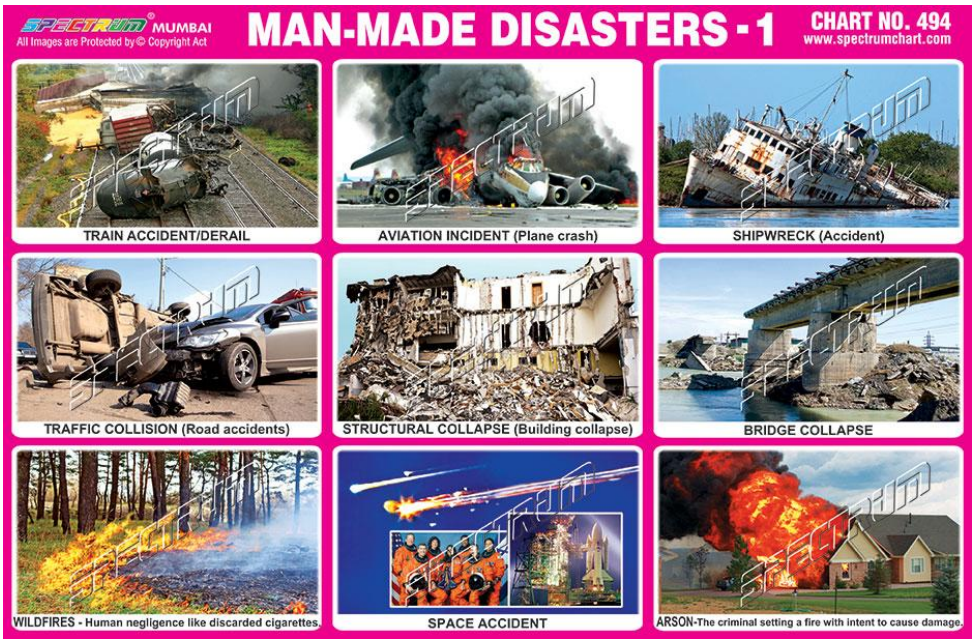
Types of Natural Disasters

Natural Types of Disasters

• 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 • Winter and ice storms • Sinkholes

Source: www.nssl.noaa.gov

Man made disasters – deforestation, environmental pollution, climate change, epidemics etc.



Source:www.spectrumchart.com

<u>Types of Man-made Disasters</u>

Man-Made and Technological Types of Disasters

- Hazardous materials
- Power service disruption &blackout
- Nuclear power plant and nuclear blast
- Radiological emergencies
- Chemical threat and biological weapons
- Cyber attacks
- Explosion
- Civil unrest

Difference between Natural and Man - made Disasters

An earthquake, a natural phenomenon, is disastrous when it damages houses, infrastructure leading to deaths of people, livestock and it takes a lot time to return to their normal life. Similar is the case with the disasters that are caused by human beings such as the Bhopal gas tragedy (1985), the life of the people has not come to normalcy even today also.

A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.

The first question that crosses our minds is what exactly a disaster is. As per the Report of High Powered Committee (HPC) on Disaster Management, a disaster is an event triggered by natural or man-made causes that leads to a sudden disruption of normalcy within society, causing widespread damage to life and property.

As per the Disaster Management Act (2005), a “disaster” means a catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or man-made causes, or by accident or negligence, which results in substantial loss of life or human suffering or damage to, and destruction of, property, or damage to, or degradation of, environment, and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area. Disaster is a function of the risk process. Though, most disasters are natural, human activity does increase their risk and frequency. Besides, there are disasters, which are purely man-made as certain types of fires, floods and droughts. These types are a result of faulty and insensitive developmental activities. There are several causes behind these man-made disasters such as:

- Poverty, which compels people to live in vulnerable zones

- Population growth, which means occupation of land and resources in vulnerable regions, ie. proximity/exposure (e.g., live/work near hazards)
- Rapid urbanization, forcing people to live in disaster-prone regions
- Moving away from agriculture-centric to industry-centric model of growth
- Environmental degradation like felling of trees, suffocation of green lungs, deforestation
- Lack of awareness on byelaws, vulnerable regions, and impact of developmental changes on environment

The words, *Des* (Bad)+ *Aster* (Star) make a Disaster *Thus, Disasters are catastrophic happenings, where normal patterns of life get disturbed and external help becomes crucial to save lives, prevent injury and safeguard infrastructure.*

1.3. Nature of Disaster:

Disasters have profound and often long lasting effects on the people and their safety, it is essential to acquire fullest possible knowledge about their occurrence, impacts and precautions including remedial measures. However, study of disasters has many facets. While their mechanism requires the study of the scientific aspects of their genesis and life cycle, this impact on the environment and society also need a multi-disciplinary approach involving the social and medical services. Hence, scholars for studying disasters have adopted the following six approaches:

1) Geographical Approach:

In this, social science methods are widely used and emphasis is given to the spatio - temporal distribution of hazard, impacts and vulnerability. Geographers have also given particular thought to the question of how choices are made between different types of adjustment to natural hazards.

2) Anthropological Approach:

This approach has focused on the role of disasters in guiding the socio-economic evolution of populations in dispersing them and in causing the

destruction of civilizations. A strong concern has led anthropologists to search for the threshold points beyond which local communities can no longer provide the basic requirements for survival of their members.

3) Sociological Approach:

In this approach, vulnerability and impacts are considered in terms of patterns of human behaviour and the effects of disasters on community. In addition, psychologists have studied disaster in relation to factors such as a psychologically determined defensive reaction pattern.

4) Developmental Studies Approach:

It considers problems of providing aid and relief, migration management, health care and the avoidance of starvation. Over 80 per cent of disasters occur in developing countries, and it is clear that the prevailing poverty increases human vulnerability to natural hazards.

5) Disaster Medicine and Epidemiology:

It focuses on the management of mass casualties, the treatment of severe physical trauma and the epidemiological surveillance of communicable diseases' whose incidence rates may increase during the disruption of public health measures following a disaster.

6) Technical Approach:
The natural and physical scientists emphasize upon this approach. Emphasis is given to geological, geomorphological and geophysical approaches to disasters.

1.4. Factors of Disaster:

The severity of the impacts of each disaster is reckoned in terms of deaths, damage, or costs which are dependent on the existing socio-economic conditions of the affected community. In fact, the misery of the affected people is usually increased by the following factors:

1. **Poverty:**

All disaster studies show that the wealthy among the population are less affected and are able to recover quickly. However, poverty generally makes people more vulnerable to all the impacts of disasters. It is only due to poverty that poor people are forced to live in more vulnerable areas such as the flood plains of rivers. Usually droughts claim poor peasant farmers as victims and rarely the wealthy; and famines are the result of a lack of purchasing power to buy food rather than an absence of food. Many people are forced to move from their homes to other parts

of their countries or even across borders to survive. Such crisis induced migration poses considerable challenge both in terms of immediate assistance and long term planning for development.

2. **Population Growth:**

There is an obvious link between the increase in losses from a disaster and increase in population density. If there are more people and structures where a disaster strikes, there will be more impact. Increasing number of people will compete for limited resources (e.g., employment opportunities) which can lead to conflict. This conflict may result in crisis-induced migration. This type of growth occurs predominantly in developing countries, which may aggravate to the disasters.

3. **Rapid Urbanization:**

Rapid population growth and migration are closely related to the major phenomenon of rapid urbanization. It is characterized by rural poor or people ill disadvantaged areas moving to urban and metropolitan areas in search of economic opportunities and security. These people find fewer options for availability of safe and desirable places to build their houses. Here again, competition for scarce resources can lead to social conflicts.

Many of the landslides or flood disasters are closely linked to rapid and unchecked urbanisation which forces low-income families to settle on the slopes of steep hillsides or banks of rivers.

4. **Transitions in Cultural Practices:**

Many of the inevitable changes that occur in all societies lead to an increase in their vulnerability to disasters. Obviously, all societies are constantly changing and are in a continual state of transition. These transitions are often disruptive and uneven, leaving gaps in social coping mechanisms and available technology. These transitions include nomadic population that becomes sedentary, rural people who move to urban areas, and both rural and urban people who move from one economic level to another. More broadly, these examples are typical of a shift from non-industrialized to industrialized societies.

5. **Environmental Degradation:**

Many disasters are either caused or aggravated by environmental degradation. Deforestation leads to rapid rain runoff, which contributes to soil erosion and flooding. The destruction of mangrove swamps decreases the resistance of the coastline to withstand strong winds and storm surges.

Drought conditions may be intensified by deforestation, overgrazing, the stripping of topsoil, poor conservation techniques and depletion of both

the surface and subsurface water supply and to an extent, unchecked population.

6. **Lack of Awareness and Information:**

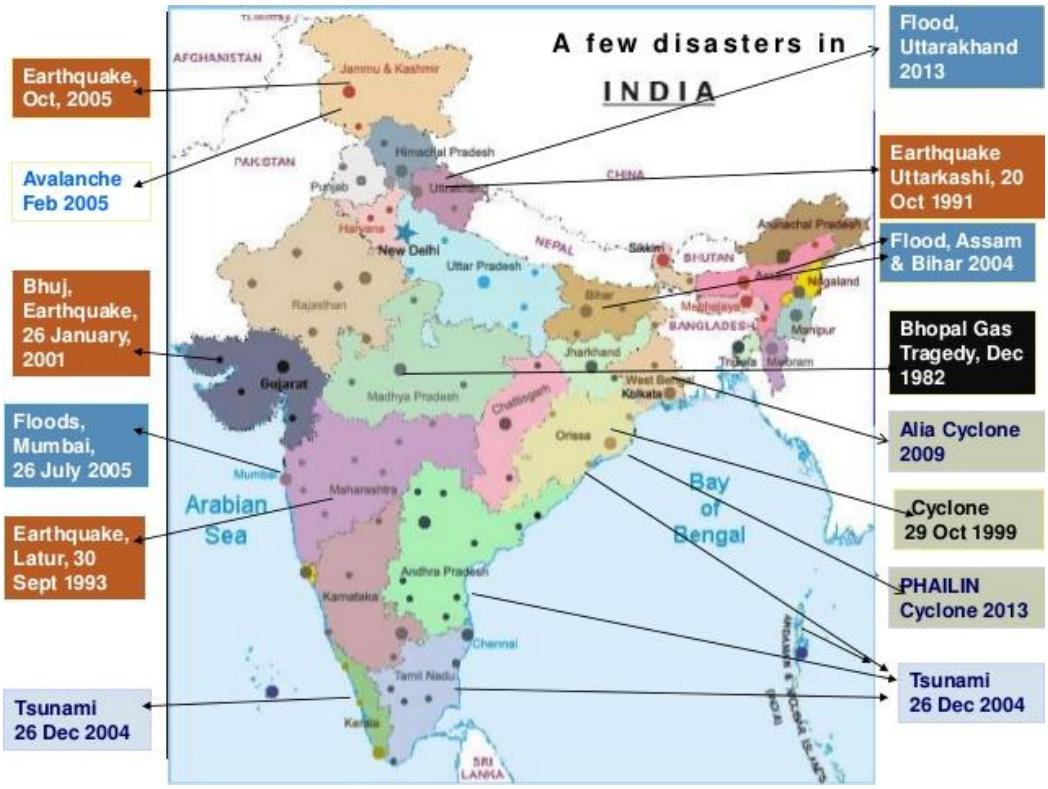
Lack of awareness and proper information usually converts a hazard into a Disaster. This ignorance may not necessary be due to poverty, but due to a lack of awareness of what measures can be taken to build safe structures on safe locations. Perhaps some people did not know about safe evacuation routes and procedures. Other population may not know where to turn for assistance in times of acute distress. In most disaster prone societies, although there is a traditional wealth of understanding about disaster threats and responses, yet, they may not know what specific steps they should tale immediately to escape the crisis.

7. **War and Civil Strife:**

War and civil strife are regarded as hazards, that is, extreme events that produce disasters. The causal factors of war and civil strife include competition for scarce resources, religious to ethnic intolerance and ideological differences.

DISASTERS IN THE LAST DECADE:

TYPE OF DISASTER	**YEAR**
Uttarkashi Earthquake	1991
Punjab Floods	1993
Chamoli District (Uttaranchal) Earthquake	1995
Odisha Heat Wave	1998
Odisha Super Cyclone	1999
Bhuj (Gujarat) Earthquake	2001
Indian Ocean Tsunami	2004
Jammu & Kashmir Earthquake	2005
Kumbakonam Fire Tragedy	2005
Kosi (Bihar) Floods	2008
Uttarakhand Floods	2010
Mahanadi Flood	2011
Very Sever Cyclone Phailini	2013
Very Sever Cyclone Hudhud	2014



Natural Hazard prone areas in India

1.5. Hazard:

A dangerous phenomenon, substance, human activity or condition 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.

Various types of Hazards:

I. Water Climate related Hazards

i. Tropical Cyclone
ii. Tornado and Huricane
iii. Floods
iv. Drought
v. Hailstorm
vi. Cloudburst
vii. Landslide
viii. Heat and Cold Wave
ix. Snow Avalanche
x. Sea erosion

II. Geological Hazards

i. Earthquake
ii. Tsunami
iii. Volcanic eruption
iv. Landslide
v. Dam burst
vi. Mine Fire

III. Environmental Hazards

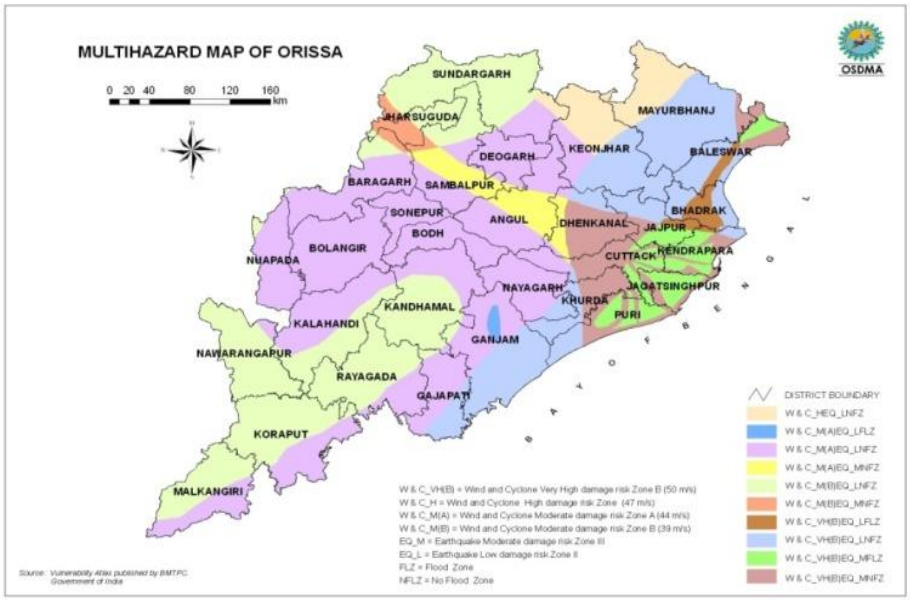
i. Environmental Pollution
ii. Deforestation
iii. Desertification

IV. Biological

i. Human / Animal Epidemic
ii. Pest Attacks
iii. Pest Infection
iv. Food Poisoning
v. Weapons of Mass destruction

CASE STUDY: Hazard Vulnerability in Odisha:

Odisha falls between Zones II and III i.e. low damage risk zone and moderate damage risk zones. However, it may be noted that major part of Gujarat, including Ahmedabad, also comes in the moderate risk zone but Ahmedabad City was badly affected by the impact of the Bhuj 2001 earthquake. The details of the location of the districts, according to seismic zones, are given in the Table below:

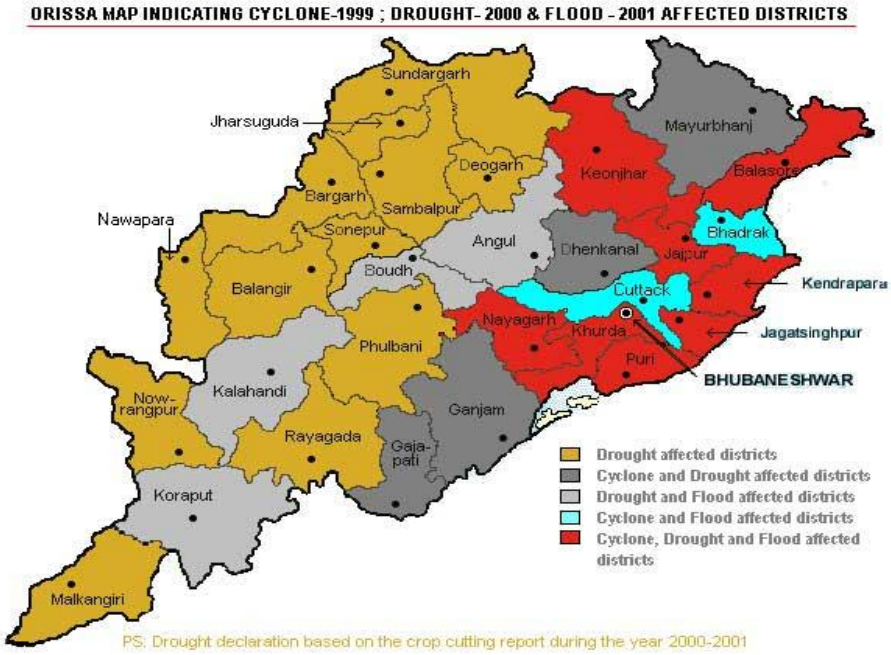


District Coming Under Moderate Risk Zones (Zone-III)	Districts Coming Under Low damage Risk Zones (Zone-II)
Sundargarh, Jharsuguda, Bargarh,Sambalpur, Deogarh,Anugul, Dhenkanal, Jajpur, Cuttack, Khurda, Puri, Jagatsighpur, Kendrapada, Bhadrak, Mayurbhanj, Balasore.	Malkanagiri, Korapur, Rayagada, Gajapati, Ganjam, Kandhamala, Nawrangpur, Kalahandi, Nuapada, Bolangir, Sonepur, Boud, Nayagarh, Keonjhar,

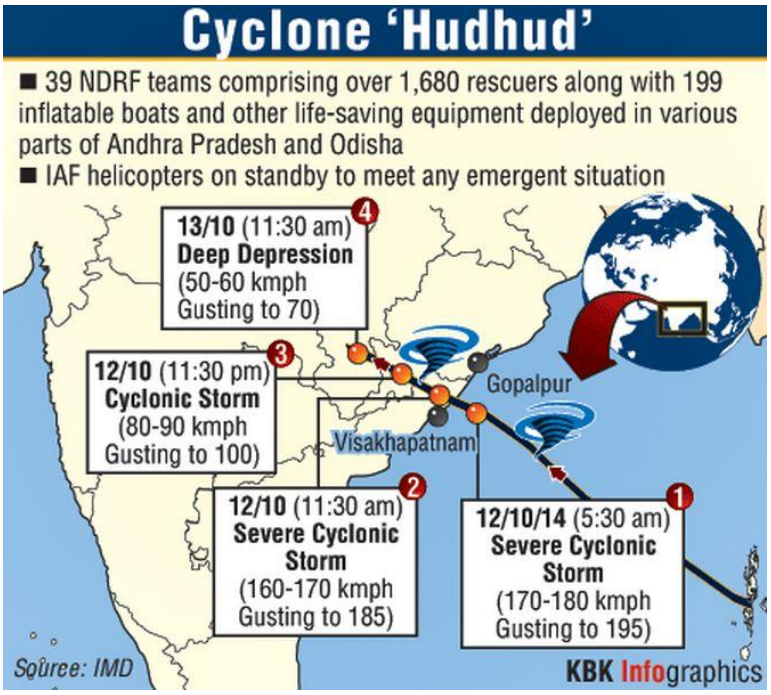
Details of areas vulnerable to floods, cyclones and earthquakes:

- 11 major river system making Odisha vulnerable.
- 480 Km long coastline with two cyclone seasons.
- Odisha coast is vulnerable to tsunami. 328 villages covering 6 coastal districts located within 1.5 km of the coastline are identified as tsunami prone villages.
- Rains fed areas of Odisha are prone to Drought.
- Lightning and Thunder storm take more life in the state.
- Hilly regions vulnerable to landslides/Hailstorms/cloudbursts
- Different types of manmade Hazards


EARTHQUAKE ZONES OF ORISSA
SUNDARGARH
JHARSUGUDA
MAYURBHANJ
DEOGARH
KEONJHAR
BALESWAR
BARAGARH
SAMBALPUR
BHADRAK
SONEPUR
ANGUL
DHENKANAL
JAJPUR
BODH
BOLANGIR
KENDRAPARA
NUAPADA
CUTTACK
JAGATSINGHPUR
NAYAGARH
KHURDA
KANDHAMAL
PURI
KALAHANDI
GANJAM
NAWARANGAPUR
RAYAGADA
GAJAPATI
KORAPUT
MALKANGIRI
LEGENDS
District Headquarter
District Boundary
Moderate Damage Risk Zone (MSK VII)
Low Damage Risk Zone (MSK VI)
Source : Vulnerability Atlas published by BMTPC Government of India


ORISSA MAP INDICATING CYCLONE-1999 ; DROUGHT- 2000 & FLOOD - 2001 AFFECTED DISTRICTS
Sundargarh
Jharsuguda
Mayurbhanj
Deogarh
Keonjhar
Balasore
Bargarh
Sambalpur
Nawapara
Sonepur
Angul
Bhadrak
Dhenkanal
Jajpur
Boudh
Balangir
Kendrapara
Cuttack
Nayagarh
Khurda
Jagatsinghpur
Phulbani
Puri
BHUBANESHWAR
Kalahandi
Now-rangpur
Ganjam
Rayagada
Gaja-pati
Koraput
Malkangiri
Drought affected districts
Cyclone and Drought affected districts
Drought and Flood affected districts
Cyclone and Flood affected districts
Cyclone, Drought and Flood affected districts
PS: Drought declaration based on the crop cutting report during the year 2000-2001

Type of Hazard	Particulars	% of Area vulnerable
Flood	Flood Prone	1.9%
	Flood Protected	2.4%
	Outside Flood Area	95.7%
Cyclone	198-180 km/h	24.1%
	169.2 km/h	3.3%
	158.9-140.9 km/h	72.6%
Earth-quake	Low damage risk Zone	84.2%
	Moderate damage risk zone	15.8%



Source: Indian Metrological Department, India

1.6. Difference between Disaster and Hazard:

Hazard and disaster are closely related to each other. A hazard is a natural event while the disaster is its conequence. A hazard is a perceived natural event which threatens both life and property. A disaster is the culmination of such hazards.

A hazard is a potential for a disaster. A hazard becomes a disaster when it hits an area affecting the normal life system. If a hazard like a cyclone hits an unpopulated area, say an popuated coast,it need not be considerecl as a disaster. However, it will be considered a disaster if life and property are seriously damaged. A hazard may be regarded as pre-disaster situation, in which some risk of disaster exists, because the human population has placed itself in a situation of risk.

Disasters are extreme events which cause great loss of life and/or property and create severe disruptions to human activities. They can be created by human actions, e.g., transport accidents and industrial explosions or natural processes like earthquakes. Therefore,a hazard occurs as fatal when extreme events or processes occur in an area of human settlement and could cause loss of life and damage to existing constructed resources or infrastructure.

1.7. Vulnerability:

Vulnerability is a set of prevailing or consequential conditions, which adversely affect the community's ability to prevent, mitigate, prepare for and respond to hazardous events.

What is Vulnerability?

Vulnerability is:

- Susceptibility to a potentially damaging phenomenon
- Extent to which a community, structure, service, or geographic area is likely to be managed or disrupted by the impact of a particular hazard
- Gauged on the basis of nature, construction and proximity to hazardous terrain or a disaster prone area
- Projected in terms of class, ethnicity, gender, disability, age, and economic conditions

As per United Nations Framework Convention on Climate Change (UNFCCC), developing countries are the most vulnerable to impact of climate change because they have fewer resources to adapt: socially, technologically and financially.

Types of Vulnerability:

Physical/ Material Vulnerability:

- Disaster prone location of community
- Houses
- Farmlands

- Infrastructure
- Insecure sources of livelihood
- Risky sources of livelihood
- Lack of access and control over means of production
- Dependency on money lenders
- Occurrence of chronic and acute food shortage
- Over exploited natural resources
- Exposed to violence

Social/Organisational Vulnerability:

- Poor leadership
- Poor initiative
- Poor organizational structure
- Ineffective decision making (people/groups are left out)
- Unequal participation in community affairs
- Rumors
- Divisions in community
- Conflicts
- Poor relationship with Government and other stakeholders
- Isolated from outside world

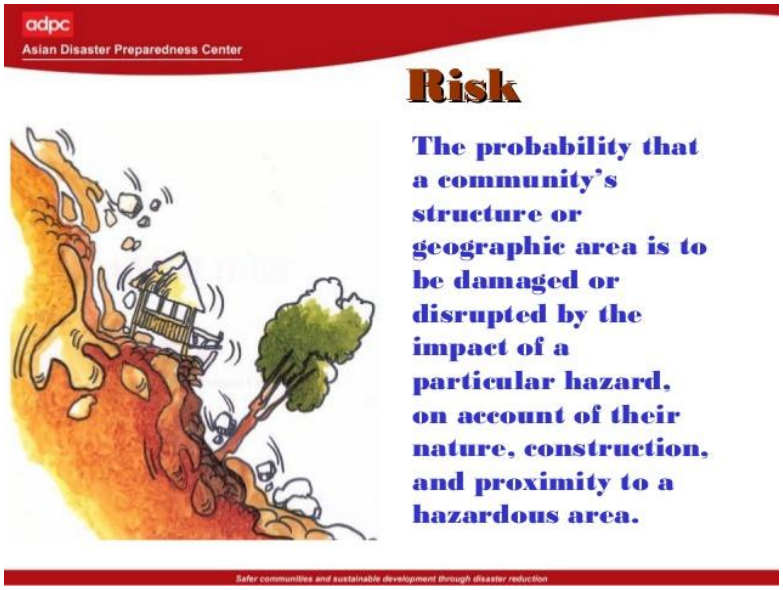
Motivational/Attitudinal Vulnerability:

- Negative attitude towards change
- Passivity
- Fatalism
- Helplessness
- Lack of initiative
- Lack of unity, cooperation, solidarity
- Negative beliefs/ideologies
- Lack of awareness about hazards and consequences
- Dependent on external support

1.8. Risk:

The combination of the probability of an event and its negative consequences .The risk is generally defined as the expected impact caused by a particular phenomenon. It combines the livelihood or probability of a disaster happening and the negative effects that result if the disaster happens.

Disaster Risk is the chance of damage and loss as a result of the occurrence of a hazard.



Source: Asian Disaster Preparedness Center

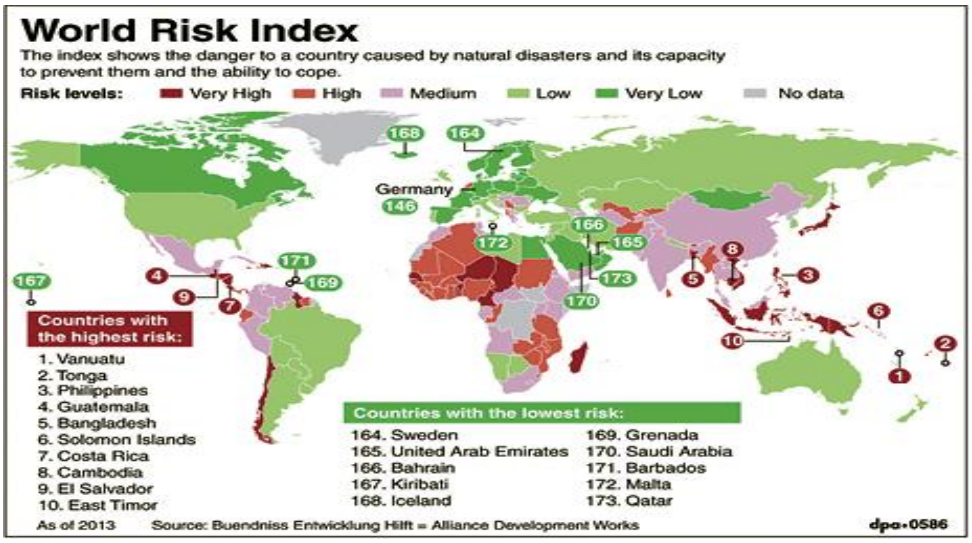
Elements at Risk:

- People
- Livestock
- Rural / Urban Houses
- Crops, Trees
- Telephone, Electric poles
- Boats, Looms, Working Implements
- Personal Property
- Electricity, Water and Food Supplies
- Infrastructure Support

Scale of Disaster is Dependent on:

- Lead Time Availability.
- Intensity of Hazard.
- Duration.

- Spatial Extent.
- Density of Population & Assets.
- Time of occurrence.
- Vulnerabilities existing in the Elements at Risk.
- Hazard X Vulnerability = Disaster



Source: Alliance Development Works

Risk is the:

- Expected loss (lives lost, persons injured, damage to property and disruption of socio-economic and educational activity)
- Product of hazard and vulnerability

It is important to consider the ***social contexts*** in which risks occur, as people do not necessarilyshare the same perceptions of risk and their underlying causes. Some professionals identify ***capacity*** as an element that can drastically reduce the effects of hazards and vulnerabilities. There is no consensus on the use of a particular definition on risk. It is, however, conventionally expressed by the equation:

Risk = Hazard
+Vulnerability- Capacity

By this definition, vulnerability increases the risk of a hazard turning into a disaster; and capacityhas the potential to control the risk factor. If capacity to cope with hazard and vulnerability is high, risk factor would be low and if capacity is low, then risk would be high. Thus, we have to be clear about the terms vulnerability and capacity as well.

1.9. Capacity:

As per the United Nations International Strategy for Disaster Reduction (UNISDR) definition, capacity is the combination of all the strengths and resources available within a community, society or organization that can reduce the level of risk, or the effects of a disaster. Capacity may include physical, institutional, social or economic means, as well as skilled personal or collective attributes such as 'leadership' and 'management.' Capacity may also be described as capability and can also be referred to resources, attitudes, skills and knowledge to cope with crises. Capacity basically, it may describe as the ability to perform.

1.10. Management of Disaster:

***What is Disaster Management*?**

The disaster management process attempts to integrate several interrelated components in an orderly and coordinated manner. This includes activities pre-, during and after the occurrence of a disaster. An effective management of disasters is based on four types of systematic assessment of: hazards, vulnerability, risk and capacities. Disaster management as an activity involves measures to:

- Reduce the risks associated with disasters through timely measures, short-term and long-termpolicies

- Provide required assistance to communities during and after the disasters; and
- Ensure rapid and sustained recovery and rehabilitation after the occurrence of disasters

The new vision adopted for disaster management focuses on:

- Preparedness rather than post-crisis management
- Coordinated participatory approach
- Technology upgradation and deployment
- Information as a tool for disaster management
- Recognition of linkages between disasters and development
- Connecting specific programmes for management of natural disasters
- Forecasting and warning using latest technology; and
- Disaster management as a continuous and integrated part of development process.

'**Disaster Management'** is defined as a continuous and integrated process of planning, organizing, coordinating and implementing measures which are necessary or expedient to prevent danger or threat of any disaster, mitigation or reduce the risk or severity or consequences of any disaster, capacity-building and preparedness to deal with any disaster, prompt response to any threatening disaster situation or disaster, assessing the severity or magnitude of effects of any disaster, evacuation, rescue and relief, rehabilitation and reconstruction.

"Disaster management" can be defined as the range of activities designed to maintain control over disaster and emergency situations and to provide a framework for helping at-risk persons to avoid or recover from the impact of the disaster. Disaster management deals with situations that occur prior to, during, and after the disaster.

Disaster Management can be defined as the organization and management of resources and responsibilities for dealing with all humanitarian aspects of emergencies, in particular preparedness, response and recovery in order to lessen the impact of disasters.

Concept

When there is an unexpected situation, timely and accurate information as well as a network which is flexible to connect, helps in reinforcement of cooperation and self help activities in citizens and, also helps in assistance of staff members at the disaster site who are supported by the system of wide area assistance

1.11. Objective of Disaster Management:

Disaster management refers to the policies, programs, administrative actions and operations undertaken to address a natural or man-made disaster through preparedness, mitigation, response and recovery. Although the actions taken to address a specific disaster vary depending on the hazard, four objectives of disaster management apply to every situation.

- **Reduce Damages and Deaths:**

Effective disaster management reduces or avoids morbidity, mortality, and economic and physical damages from a hazard. The methods used to achieve this include hazard and vulnerability analysis, preparedness, mitigation and prevention measures, and the use of predictive and warning systems. Examples of effective disaster management techniques include completing risk assessments, building community storm shelters and installing community outdoor siren systems.

- **Reduce Personal Suffering:**

Disaster management reduces personal suffering, such as morbidity and emotional stress following a hazard. The methods used to prevent suffering include hazard and vulnerability analysis, preparedness, and mitigation and prevention measures. Examples of efforts to reduce personal suffering include providing safe food supplies and potable drinking water when water supplies become contaminated.

- **Speed Recovery:**

The third objective is to speed recovery. The methods to accomplish this objective include effective response mechanisms and the institution of recovery programs and assistance. Examples of efforts to speed recovery include providing paperwork assistance for insurance claims, and grant or loan applications.

- **Protect Victims:**

Disaster management provides protection to victims and/or displaced persons. Facilities utilize preparedness, response mechanisms, recovery programs and assistance to address shelter needs and provide protective services.

- **Other Objectives:**
  i) to reduce or avoid the human, physical, and economic losses

suffered by individuals, by the society, and by the country at large.

ii) to reduce personal suffering

iii) to speed recovery

1.12. Approaches to Disaster Management:

APPROACH	FOCUS
Conventional /Dominant Approach	It focuses on managing disasters after they have occurred. The focus is on reactive or ***Relief Paradigm***. It includes provision of food and shelter, health aspects, contingency planning, evacuation planning, organization and training, early warning and hazard monitoring system. It also includes the ***Mitigation Paradigm***, which focuses on identification of hazard prone locations, patterns of physical vulnerability, relocating; retrofitting; zoning; and building codes.
Alternative/ Progressive Approach	The focus here is on ***Development Paradigm*** with emphasis on the causal factors and processes of vulnerability, community capacitybuilding, land property ownership; access tocredit; diversification of livelihoods; and technological innovation. The ***Risk ReductionParadigm*** is also a component of this approach. It amalgamates scientific approach with traditional knowledge. The objective is to: Assess hazards,

	vulnerabilities and capacities as well as people's understanding of disaster risks Optimize existing coping strategies in the face of losses. Provide local solutions to global problems; and Treat communities as subjects and not objects
Contract-Expand Approach	This approach assumes that the component or dimensions of disaster management like disaster prevention, mitigation, response and recovery can all be carried out at the same time in a hazard-prone community. However, the relative weighing of each component contracts" or "expands", depending on the relationship between the hazard and the vulnerability of the community. It believes thatdisasters occur when a hazard exceeds a community capacity to manage it (i.e., when itsvulnerability to the hazard increases)

These approaches are followed with varied emphases in varied disaster situations at different disaster phases of a disaster management cycle.

Goals of disaster management:

- Reduce or Avoid losses from Hazards
- Assure prompt assistance to the victims
- Achieve rapid and effective recovery

1.13. Importance of Disaster Management:

Disasters are events that have a huge impact on human and the environment. Disasters are inevitable. We cannot do anything to

prevent these but disaster preparedness is only in our hand. Disaster management requires government intervention and a proper planning as well as funding. It is necessary that these disasters are always unpredictable. Flood takes place in valleys and flood plains, drought in areas with unstable ad low rainfall, and oil spills happen in shipping lanes. This predicable provides opportunities to plan for prevent and lessen the impact of disaster. Disasters are inevitable although we do not always know when and where they will happen. But their worst effects can be partially or complete prevented by preparation, early warning and swift decisive responses.

Disaster management aims to reduce the occurrence of disasters and to reduce the impact of those cannot be prevented. The government White paper and Act ob disaster Management defines the role of local authorities as well as State and National Government in disaster management. Disaster management forces come into action as soon as a disaster strikes and help out in relief, rescue and rehabilitation process. These are trained individuals and are given extensive training to perform in the event of disaster or a natural calamity and they work as a team to reduce the loss of life and helping the locals getting back to normal life.

Disaster Management is vital for the following purposes that prove its importance:

- **To avert a disaster:**

Disaster management teams can help to avert a disaster before it occurs. The Disaster management team may examine the possible causes of disaster, and may take appropriate measures to avert a disaster. For instance, forest fires, or even terrorists bombings can be averted through effective planning and pre-emptive action.

- **To undertake rescue operations:**

Disaster management personnel can undertake rescue operations effectively. Trained disaster management personnel can rescue people effectively at the time of floods, major fires, building collapses, and so on.

- **To provide relief measures:**

Disaster management team is responsible to provide relief measures to the victims. For instance, the team can make arrangement for food, clothing, and relief camps, medicines and so on. Such measures would reduce the misery of the disaster victims.

- **To undertake rehabilitation programmes:**

Disaster management team can work effectively to undertake rehabilitation programmes in the affected areas. For instance, in the earthquake affected areas, rehabilitation programmes include:

a. Construction of dwellings
b. Schools and other infrastructure.

- **To undertake liaison work:**

The disaster management team undertakes liaison work relating to the disaster. The liaison work is required with various agencies-private and government (including hospitals) in order to obtain funds and donations, and other resources or services so as to manage and overcome the disaster.

- **To reduce trauma and tension:**

The Disaster management team can help to reduce the trauma and tension before and after the disaster. For instance, before a disaster, the team can properly guide the people to face or handle the disaster such as floods. Also, after the disaster, the team can provide not only material or financial support, but also psychological support to overcome the traumatic effect of disaster.

- **To protect the Environment:**

Disaster management team can help to protect and preserve the environment. For example, a disaster management team can plan pre-emptive action to avert forest fires, etc.

- **To minimize losses:**

Disaster management teams can help to minimize loss of life and property. This is because; the Disaster management team can take pre-emptive actions to avert a disaster.

1.14. Scope of Disaster Management:

The term "disaster management" encompasses the complete realm of disaster-related activities. Traditionally people tend to think of disaster management only in terms of the post-disaster actions taken by relief and reconstruction officials; yet disaster management covers a much broader scope, and many modern disaster managers may find themselves far more involved in pre-disaster activities than in post-disaster response. This is because many persons who work in the development field, or who plan routine economic, urban, regional or agricultural development projects, have disaster management responsibilities. For example, housing specialists planning a low-income housing project in a disaster-prone area have the opportunity

(and an obligation) to mitigate the impact of a future disaster if the houses incorporate disaster-resistant construction technologies. In the same manner, agricultural development projects must be planned in such a way that they help stem environmental degradation and thus lower the farmer's vulnerability to losses from droughts, floods, cyclones, or other natural hazards. In fact, in dealing with natural hazards, the vast majority of disaster management activities are related to development projects; only a small portion are related to emergency response.

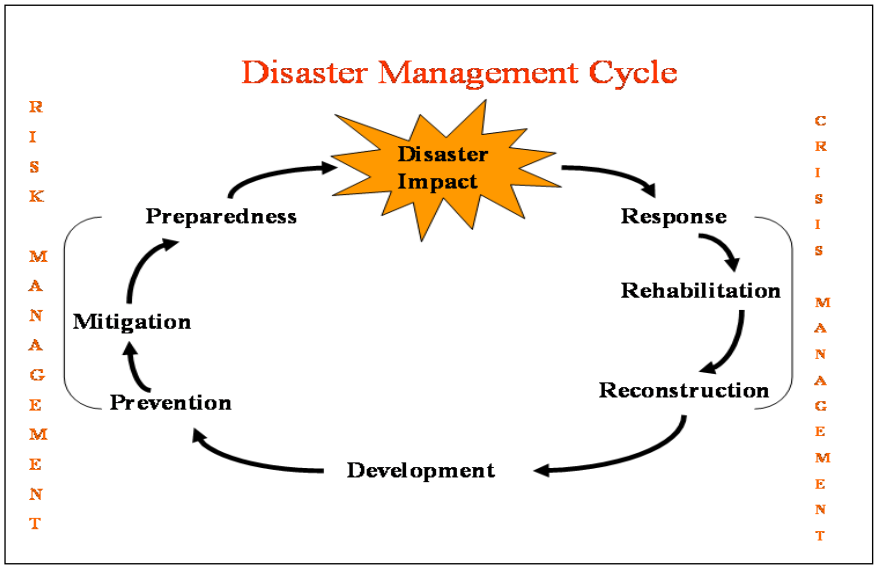
Of course, disaster management also encompasses the field of emergency assistance and long-term maintenance for refugees and displaced persons. The refugee field of disaster management is highly specialized and requires not only many development skills but also a broader awareness of political, legal, and humanitarian issues.

1.15. Disaster Management Cycle:

Disaster management aims to reduce, or avoid the potential losses from hazards, assure prompt and appropriate assistance to victims of disaster, and achieve rapid and effective recovery. The Disaster management cycle illustrates the ongoing process by which governments, businesses, and civil society plan for and reduce the impact of disasters, react during and immediately following a disaster, and take steps to recover after a disaster has occurred. Appropriate actions at all points in the cycle lead to greater preparedness, better warnings, reduced vulnerability or the prevention of disasters during the next iteration of the cycle. The complete disaster management cycle includes the shaping of public policies and plans that either modify the causes of disasters or mitigate their effects on people, property, and infrastructure.

The mitigation and preparedness phases occur as disaster management improvements are made in anticipation of a disaster event. Developmental considerations play a key role in contributing to the mitigation and preparation of a community to effectively confront a disaster. As a disaster occurs, disaster management actors, in particular humanitarian organizations become involved in the immediate response and long-term recovery phases. The four disaster management phases illustrated here does not always, or even generally, occurs in isolation or in this precise order. Often phases of the cycle overlap and the length of each phase greatly depends on the severity of the disaster.

- **Sustainable Development:** Developmental considerations contribute to all aspects of the disaster management cycle. One of the



main goals of disaster management, and one of its strongest links with development, is the promotion of sustainable livelihoods and their protection and recovery during disasters and emergencies. Where this goal is achieved, people have a greater capacity to deal with disasters and their recovery is more rapid and long lasting. In a development oriented disaster management approach, the objectives are to reduce hazards, prevent disasters, and prepare for emergencies. Therefore, developmental considerations are strongly represented in the mitigation and preparedness phases of the disaster management cycle. Inappropriate development processes can lead to increased vulnerability to disasters and loss of preparedness for emergency situations.

- **Humanitarian Action:** During a disaster, humanitarian agencies are often called upon to deal with immediate response and recovery. To be able to respond effectively, these agencies must have experienced leaders, trained personnel, adequate transport and logistic support, appropriate communications, and guidelines for working in emergencies. If the necessary preparations have not been made, the humanitarian agencies will not be able to meet the immediate needs of the people.

- **Response:** The aim of emergency response is to provide immediate assistance to maintain life, improve health and support the morale of the affected population. Such assistance may range from providing specific but limited aid, such as assisting refugees with transport, temporary shelter, and food, to establishing semi-permanent

settlement in camps and other locations. It also may involve initial repairs to damaged infrastructure. The focus in the response phase is on meeting the basic needs of the people until more permanent and sustainable solutions can be found. Humanitarian organizations are often strongly present in this phase of the disaster management cycle.

- **Recovery:** As the emergency is brought under control, the affected population is capable of undertaking a growing number of activities aimed at restoring their lives and the infrastructure that supports them. There is no distinct point at which immediate relief changes into recovery and then into long-term sustainable development. There will be many opportunities during the recovery period to enhance prevention and increase preparedness, thus reducing vulnerability. Ideally, there should be a smooth transition from recovery to on-going development.

The cycle generally comprises four major stages:

- **Disaster Prevention, Preparedness and Mitigation** rest on the principle that prevention is better than cure. This stage or phase involves all the steps necessary for creation of disaster resilient structures and communities
- **Disaster Response and Relief** includes immediate disaster search and rescue operations, provision of food, clothing, and shelter for the affected
- **Disaster Rehabilitation, Reconstruction and Recovery** takes into view the efforts to restore all essential facilities to pre-disaster status. They focus on measures that could pave the way for long-term recovery of social, economic and physical structures, as well as processes in such a way that future disasters are unable to impact severely and irreversibly.
- **Long-term Development** as the Way Forward focuses on erecting disaster resistant infrastructure and mainstreaming disaster management activities into developmental planning.

Let us look at the nature of disaster management activity at these stages in detail:

DISASTER STAGE	NATURE OF ACTIVITY
Prevention	Prevention activities aim at totally avoiding the adverse impact of hazards and providing means to minimize environmental, technological and biological disasters. Depending on social and technical feasibility and

	cost/benefit considerations, investing in preventive measures is justified in areas frequently affected by disasters.
Mitigation	Mitigation means any action taken to minimize the extent of a disaster or potential disaster. Mitigation can take place before, during or after a disaster, but the term is most often used proactively to refer **Contract-Expand Approach.** This approach assumes that the component or dimensions of disaster management like disaster prevention, mitigation, response and recovery can all be carried out at the same time in a hazard-prone community. However, the relative weighing of each component "contracts" or "expands", depending on the relationship between the hazard and the vulnerability of the community. It believes that disasters occur when a hazard exceeds a community capacity to manage it (i.e., when its vulnerability to the hazard increases) 46 to actions against potential disasters. Mitigation measures are physical and structural both, and also non-structural. Structural measures are measures that can be easily seen or perceived such as strengthening of buildings, disaster-resistant construction, and erection of infrastructure. The non-structural measures are intangible in nature. These cannot be easily quantified, but are very important such as generation of awareness, education and training, adherence to the rules and

	byelaws.
Preparedness	Preparedness entails activities and measures taken in advance to ensure effective response to the impact of hazards, including the issuance of timely and effective early warnings, preparation of emergency plans, maintenance of inventories, at-risk planning and temporary evacuation of people and property from threatened locations. It involves measures that enable governments, community and individuals to respond rapidly to disaster situations and effectively cope with them.
Response/Relief	Relief can be of an immediate, short-term, or protracted duration. For example, search and rescue of the affected people and provision of food, temporary shelter and medical care to the persons affected by the disaster are some common areas of intervention after a disaster. Relief involves strategies and ways that can help to reduce the level of suffering and mitigate the distress, so as to bring out the affected people from the shock and trauma of suddenly losing their means of livelihood. Further, the main objective of relief is to assist the affected persons to start their normal activities again.
Rehabilitation	Rehabilitation process includes all operations and decisions taken after a disaster with a view to restoring an affected community to its former living conditions, by encouraging and facilitating the necessary

	adjustments to the changes caused by the disaster.
Reconstruction	Process of Reconstruction includes the actions taken to re-establish a community, following rehabilitation after a disaster. These actions generally include construction of permanent housing, complete restoration of all services and physical infrastructure to the pre disaster state.
Recovery	Recovery refers to decisions and actions related to rehabilitation and reconstruction taken after a disaster with a view to restoring or improving the pre-disaster living conditions of the affected community. At the same time, encouraging and facilitating necessary adjustments to reduce disaster risk. Recovery activities make use of disaster risk reduction measures to improve the situation in affected areas. The aim is to also develop the areas in a way that vulnerability and risk to disasters are minimized. All development programmes in the area need to be mainstreamed with recovery programmes in order to treat disasters as development opportunities.

Check Your Progress I

Note: a) Use the space provided for your answers.

b) Check your answers with the possible answers provided at the end of this unit.

1) What do you mean by "Disaster"?

Ans.

2) Differentiate between Disaster and Hazard?

Ans.

3) What are the objectives of Disaster Management?

Ans.

4) What are the approaches to Disaster Management?

Ans.

5) What is the importance of Disaster Management?

Ans.

6) What are the stages of Disaster Management Cycle?

Ans.

1.16. Let Us Sum Up:

In this block we have discussed the meaning of disaster, vulnerability, hazard, risk and capacity and defined the relevant terms. It throws light on the general difference between disaster and hazard and disaster management, scope, importance and approaches. It also highlighted the disaster management cycle with different stages and nature of activities to be taken up.

1.17. Key Words:

- ***Prevention:*** Prevention activities aim at totally avoiding the adverse impact of hazards and providing means to minimize environmental, technological and biological disasters. Depending on social and technical feasibility and cost/benefit considerations, investing in preventive measures is justified in areas frequently affected by disasters.

- ***Capacity:*** capacity is the combination of all the strengths and resources available within a community, society or organization that can reduce the level of risk, or the effects of a disaster. Capacity may include physical, institutional, social or economic means, as well as skilled personal or collective attributes such as 'leadership' and 'management.' Capacity may also be described as capability and can also be referred to resources, attitudes, skills and knowledge to cope with crises. Capacity basically, it may describe as the ability to perform.

- ***Rehabilitation:*** Rehabilitation process includes all operations and decisions taken after a disaster with a view to restoring an affected community to its former living conditions, by encouraging and facilitating the necessary adjustments to the changes caused by the disaster.

- ***Reconstruction:*** Process of Reconstruction includes the actions taken to re-establish a community, following rehabilitation after a disaster. These actions generally include construction of permanent housing, complete restoration of all services and physical infrastructure to the pre disaster state.

- ***Recovery:*** Recovery refers to decisions and actions related to rehabilitation and reconstruction taken after a disaster with a view to restoring or improving the pre-disaster living conditions of the affected community. At the same time, encouraging and facilitating necessary

adjustments to reduce disaster risk. Recovery activities make use of disaster risk reduction measures to improve the situation in affected areas.

- ***Humanitarian Action:*** During a disaster, humanitarian agencies are often called upon to deal with immediate response and recovery. To be able to respond effectively, these agencies must have experienced leaders, trained personnel, adequate transport and logistic support, appropriate communications, and guidelines for working in emergencies. If the necessary preparations have not been made, the humanitarian agencies will not be able to meet the immediate needs of the people.

1.18. References:

1. State Disaster Management plan of Government of Odisha.
2. Training manual of IGNOU Conceptual and Institutional Framework of Disaster Management.
3. National Disaster Management Guidelines, 2007, Medical Preparedness and Mass Causality.
4. Management, National Disaster Management Authority, Government of India, October.
5. National Disaster Management Authority, September,2009, Envisioning a Safer and Disaster Resilient India, Government of India, New Delhi.
6. National Disaster Management Authority, Annual Reports, 2008-2010, Government of India, Ministryof Home Affairs, New Delhi.
7. National Disaster Response Force, Newsletter, 2009-2010. www.ndma.gov.in
8. Training Manual, 2002-2009, "Building PRI Capacities for Disaster Preparedness", United Nation Development Programme, India.
9. Training Module for Non-Governmental Organizations, Disaster Risk Management, (2002-2007). An Training of Trainers Manual, 2008, "Gender Mainstreaming in Disaster Risk Management", GoI UNDP.
10. Disaster Risk Management Programme, June.United Nations Development Programme, 1991, Disaster Management Manual, December.

1.19. CHECK YOUR PROGRESS – POSSIBLE ANSWERS:

Check Your Progress I

1) The 'Disaster' owes its origin to the French word 'Desastre' which is the combination of the article - 'des' and 'astre' meaning 'star'. In earlier days a disaster was considered to be due to some unfavorable star. Nowadays, the term Disaster' is commonly used to denote ally odd event, be natural or manmade, which brings about immense misery to a region. So that it becomes difficult to cope with the situation through local resources.

2) Hazard and disaster are closely related to each other. A hazard is a natural event while the disaster is its conequence. A hazard is a perceived natural event which threatens both life and property. A disaster is the culmination of such hazards.A hazard is a potential for a disaster. A hazard becomes a disaster when it hits an area affecting the normal life system. If a hazard like a cyclone hits an unpopulated area, say an popuated coast,it need not be considerecl as a disaster.

3)
a) Reduce Damages and Deaths
b) Reduce Personal Suffering
c) Speed Recovery
d) Protect Victims
e) Reduce or avoid the human, physical, and economic losses suffered by individuals, by the society, and by the country at large.
f) Reduce personal suffering
g) To speed up recovery

4) Conventional/Dominant Approach

Alternative/ Progressive Approach

Contract-Expand Approach

5) To avert a disaster

To undertake rescue operations

To provide relief measures

To undertake rehabilitation programmes

To undertake liaison work

To reduce trauma and tension

To minimize losses

To protect the Environment

6) Prevention

Mitigation

Preparedness

Response/Relief

Rehabilitation

Reconstruction

Recovery