CHAPTER-1 INTRODUCTION

Hazard

i) A hazard is something that can cause harm to the property and human lifes.

ii) Hazard just impose a threat to life and property for e.g- electricity, chemical working up in a ladder, noise.

iii) This hazard is termed as disaster when they cause wide spread destruction of property and human lifes.

iv) Once a hazard becomes active then it is no longer just threat it becomes a disaster.

Risk:-

Risk is the chance high or low that any hazard will actually cause somebody harm.

Types of risk:-

There are two types of disaster

i) Natural disaster

e.g.- Earthquake, Tsunami, drought, Flood, Landslides cyclones etc.

ii) Man made disasaster

e.g.- Train accident, Flight, bus accident, industrial accident, nuclear explosion.

Types of hazard:-

i) Geological - landslieds, Tsunami, earthquake, volcanic eroption.

ii) Metalogical - cyclone, Flood, drought

iii) Environmental - Deforestation, pollutant

iv) Industrial - water pollution, Air pollution

Indian Metological department (IMD) and Centre water commision gives data about weather condition.

Average annual rain-fall in India = 118 cm.

Maximum rainfall - cherapunji (northeast)

Vurnerability:-

It describe the characteristic of a community system, asset (thing) that may it susceptible to the damaging effect of a hazard.

e.g - Poor design & construction of a building

ii) Inadiquet protection of asset

iii) Lack of public information and awareness

Disaster Management cycle:-

Disaster Management aims to reduce or avoid the potential losses from hazard, assure prompt an appropriate assistance to victims (who public involve) for the disaster and achive rapid and effective recovery.

Disaster management cycle illustrates the ongoing process by which government, business and civil society, plan for reduce the impact of disaster, react during an immediately following a disaster and takes steps to recover after a disaster has occure.

Elements:-

i) Mitigation - minimizing the effect of disaster

ii) preparedness - preparedness means planning how to response.

iii) Response - Effort to minimize the hazard created by disaster.

iv) Recovery - Returning community to normal.

CHAPTER-2 EARTHQUAKE

Defination:-

I) Any sudden shaking of the ground caused by the passage of seismic wave through earth rocks.

II) Seismic wave are produce when some form of energy stored earth crust is suddenly realeased this happen when mass of ~~rock~~ rock straining against one another.

III) Earthquake occure mostly along geological fault, narrow zones where rock masses moves in relation to one another.

IV) Scientific study of all aspects to earthquake is called as seismology.

Richter's Scale:-

i) It is a quantitative Measure of an earthquake magnitude. It was developed by American Seismological channels Richter.

ii) The earthquake magnitude is determined using the logarithim of the amplitude (height) of the largest seismic wave calibrated (to bring value to standard value) to a scale by a seismograph.

Methodology:-

I) One the original Richter scale the smallest earthquake measurable at that time when assigned values close to zone on the seismograph of the period.

ii) Modern seismograph can detect seismic waves even smaller than those originally chosen for zero magnitude, so it is possible to measure earthquake having negative magnitude on the richter's scale.

iii) In theory the richter's scale are no upper limit but in practice no earthquake has ever been registered on the scale above magnitude 8.6 (chile, south america, 1960)

Magnitute level	Catagory
1 - 2.9	Micro
3 - 3.9	Minor
4 - 4.9	Light
5 - 5.9	Moderate
6 - 6.9	Strong
7 - 7.9	Major
> 8	Great

Hazard zone in India for earthquake

Zone-5 :-

i) High risk

ii) Magnitude > 9

iii) Kashmir, central himlayas, north and middle bihar, northest region, Andaman nik and necober group of island.

2) Zone-4

i) Magnitude nearly equal to 8
ii) Himanchal pradesh, utrakandh, sikkim, dehli, bihar.

3) Zone-3

i) Moderate risk
ii) Magnitude nearly 7
iii) It covered maximum part of indian
iv) e.g - Kerla, Goa, Lakhadhip island, Gujurat, west bengal, panjab, rajastan, Madhya pradesh, Jarkandh, chhatisgarh, Maharastra Andhra pradesh, tamilnadu, karatak, odisha (BBSR)

4) Zone-2

i) Low risk
ii) Magnitude > 7 (less than 7)
iii) Rourkela and remaining part of indian.

5) Zone-1

Not listed till now.

Seismic risk:-

It refers to risk of damage from earthquake to a building, system or other enlity (object). A building located a region of high seismic hazard is at lower risk if it is bit to sound or proper seismic engineering response, on the other hand the building located in a region with a history of minor seismic activity but subjected to poor

seismic design can be at higher risk.

Effects of earthquake:

i) The effects of earthquake are terrible and devasting.

ii) Many building, hospital, schools are destroyed due to it.

iii) The environmental effects of it are that including surface faulting and Tsunami, landslide and ground failure

Mitigation strategies:-

Mitigation mainly focuses on minimizing the destruction by a hazard at offers long term cost effective methods or detailing with or managing natural disaster

There are two approaches for mitigation

1) Structural approach

2) Non structural approach

Structural approach:-

There are two types of structural approach.

i) Engineered structure.

ii) Non-engineered structure.

Engineered structure:-

i) Engineered structure involves architects and engineers during the planning, designing and construction of structure including buildings, dams, roads, bridges etc.

ii) Many countries have rules and laws providing Codes for engineer construction.

iii) This code provide gaulde line for approach appropriate design and construction technique specific disaster like earthquake and cyclone.

iv) such structure can be constructed after Collecting the previous data and related for that area and related metrological parameter (wind, velocity - direction, rainfall and it duration)

Non- Engineer structure:-

i) This structures are generally constructed by the people with the help of local masons and carpenter using locally available raw material.

ii) This structures can be made safer if people are trained and given improve design.

iii) This structure are normally of low cost and have a less strength for a disaster.

Non-structural approach:-

Non- structural approach are those measures that attempt to bring about coordinations of effort and between all organisations and person during all phase of disaster management, training, public awerness, legislation, policy making, perparation of action plan. some of the non structural mitigation are.

1) Legal frame work
2) Incentives
3) Insurance
4) Training, education, public awareness.
5) Warning system.

1) Legal frame work:-

i) In some of the disaster like flood, cyclone, earthquake more casualty occure because people either live in low flood area or not follow building codes made for highig seismic zones.

ii) In case people are made to follow safe principles bye laws and construction in unsafe area is restricted the disaster can be mitigated

Incentives:-

i) By suitable incentives people could be encourged to adopt safe measures.

ii) For exam: In high seismic zones if some incentive can be provide to construct earthquake resistance houses in the form of grand or sublidy

iii) People will adopt such mitigation measures.

Insurance:-

i) Insurance of crops, building and other infrastructure is another mitigation measure.

ii) Insurance company may provide soft loan for disaster ~~seismic~~ resistance structure and buildings.

Training, education and Public awareness :-

i) Training of public, officials at different levels in an essential part of disaster or disaster management.

ii) Separate training for technical people and NGO (non. Govt. organisation) is also required for specific disaster mitigation.

iii) The general people should be made away and kept inform about the nature of hazards to to which their exposed and available protection measures.

Warning system :-

i) A reliable and timely warning of disaster can save a lot of human lifes.

ii) For example in A.P where cyclones are more frequent depth toll has been considerably minimize because of effective warning system and people response.

Mitigation strategy for earthquake

i) Seismic building codes

ii) Seismic zonation.

iii) Appropriate Location Planning and land use regulation

iv) Retrofitting of existing building (To apply new method, technology.)

Government of Indian initiatives:-

i) A comprehensive programme for earthquake risk mitigation is being taken up this includes in co-operation of B.I.S (Bureau Indian Standard) codes in building regulation, town and Country planning.

ii) An expert commitee apointed by the nation care group for earthquake risk mitigation has submitted its report covering appropriate amendments to the existing town and country planning act and zoning regulation and building development control regulation and building by laws.

iii) The model building by laws also cover the aspect of in all engaging technical implimentation of the safety aspects and upgrading the strength of existing structure.