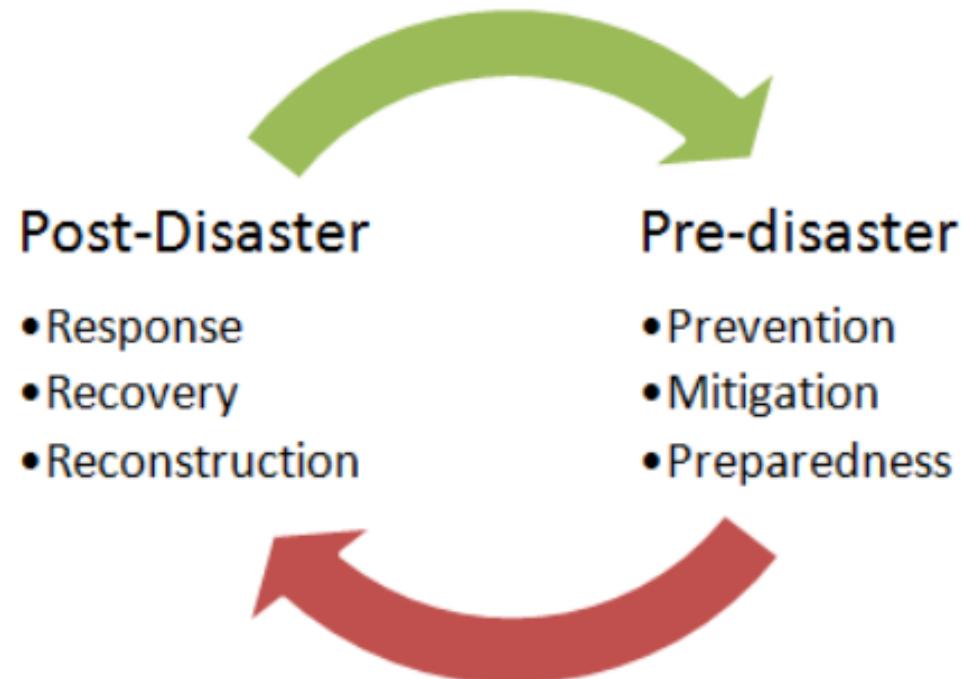


# Unit -4



# Components of Disaster Management

- Disaster management is fundamentally disaster risk management.
- To avoid disaster, to reduce risk, and recover its losses.
- Pre-Disaster and Post-Disaster Phases.

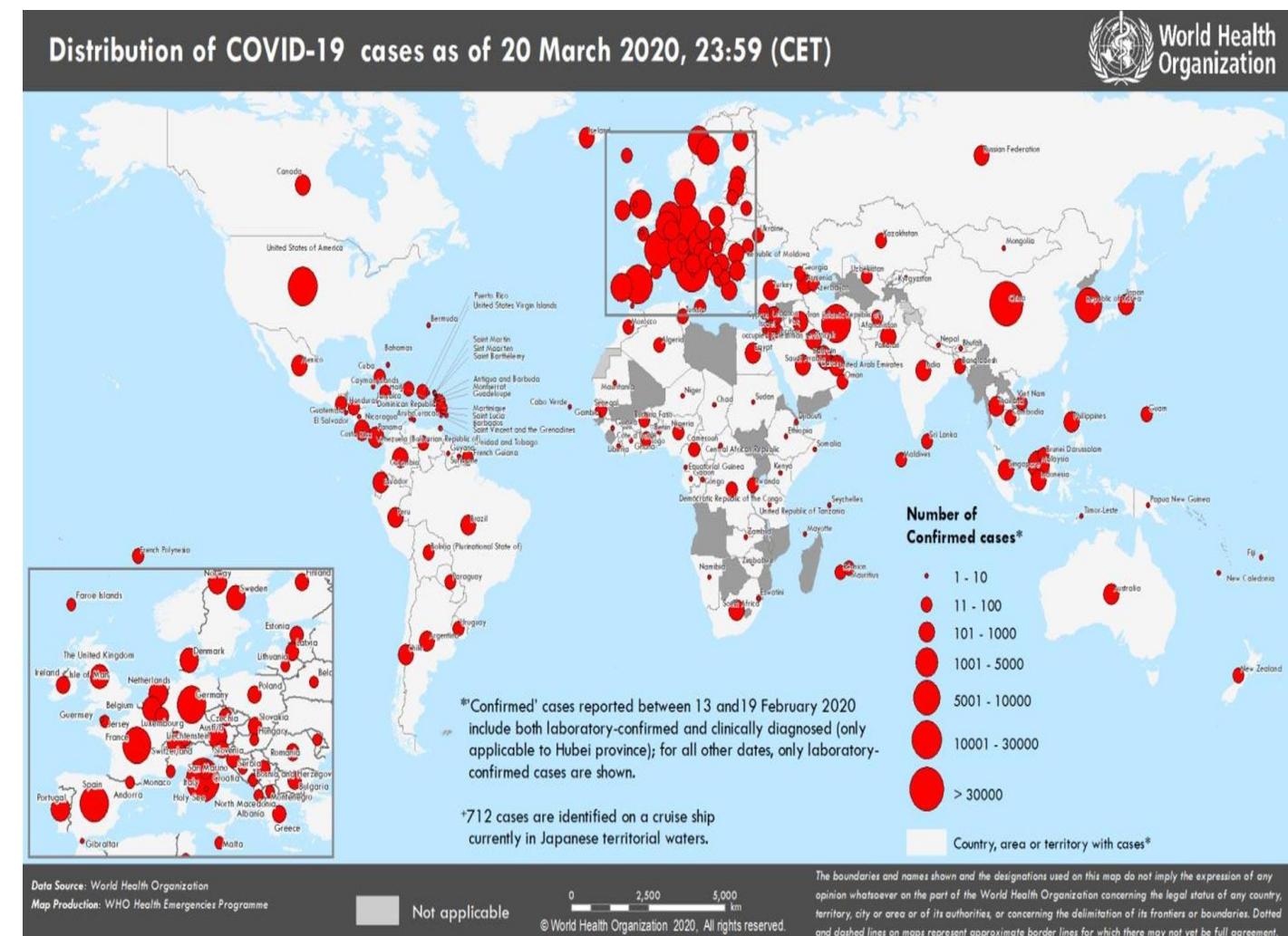
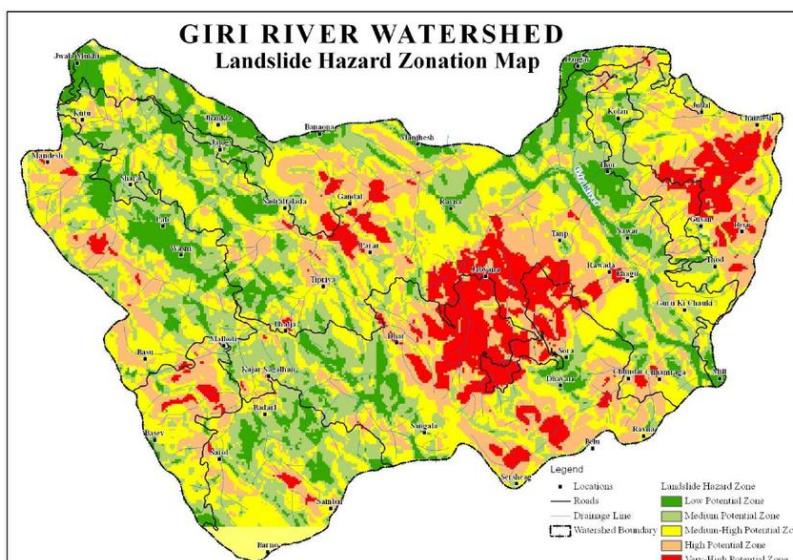
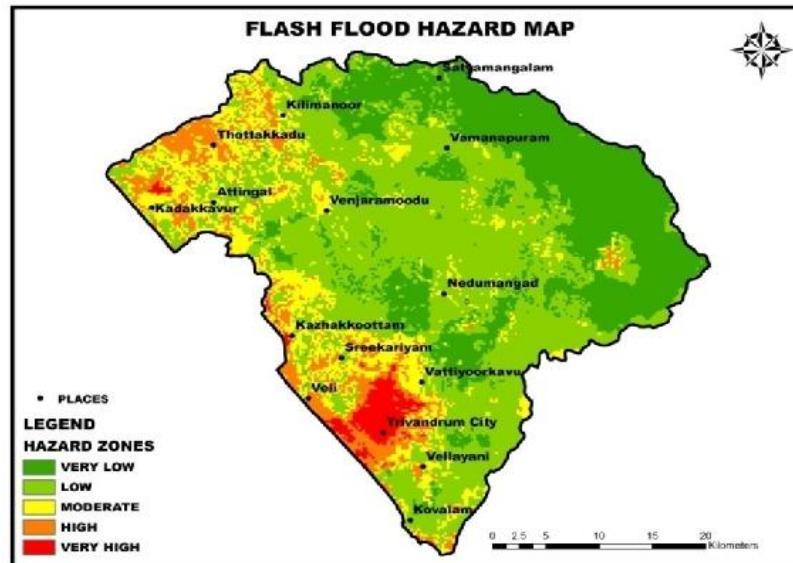




# Disaster Management

- Flood (Structural and non-structural measures)
- Earthquake (EWS, Earthquake resistant structures, Public Awareness)
- Cyclone (EWS, Shelter belts, Landuse Control and Settlement Planning)
- Landslide (Drainage measures, Erosion-control, preventing Deforestation and Improving Aforestation).
- Tsunami (Construction of Seawalls and Break waters, Protecting Coastal forests and Planting Tree Belts, Coral Reefs, EWS)

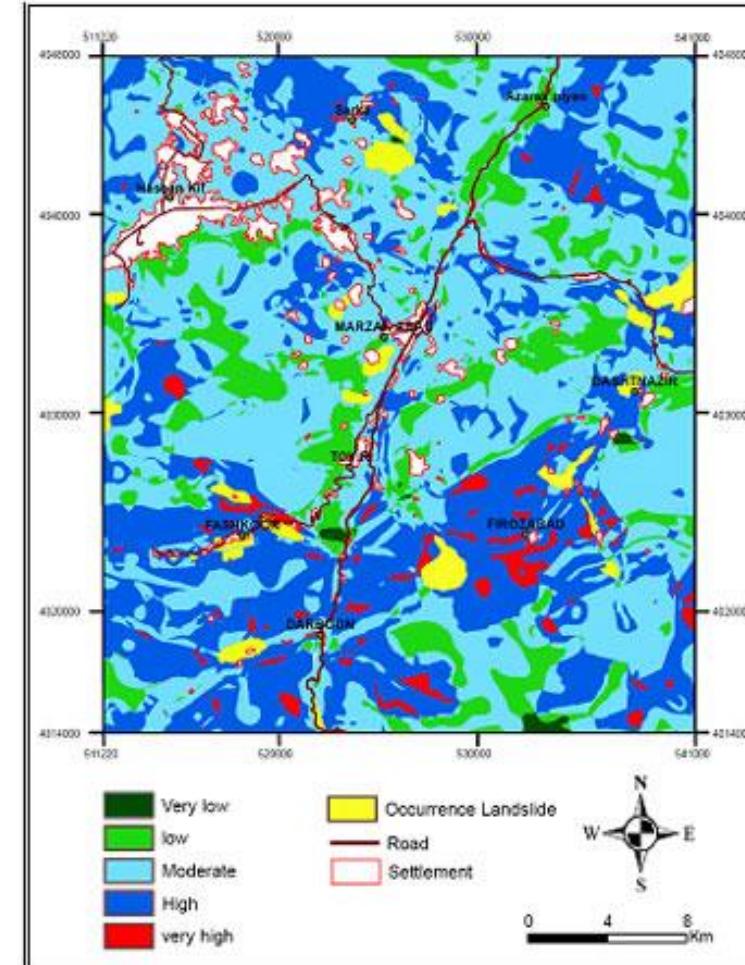
# Pre-Disaster Stage – Preparing Hazard zonation maps





# Preparing hazard zonation maps

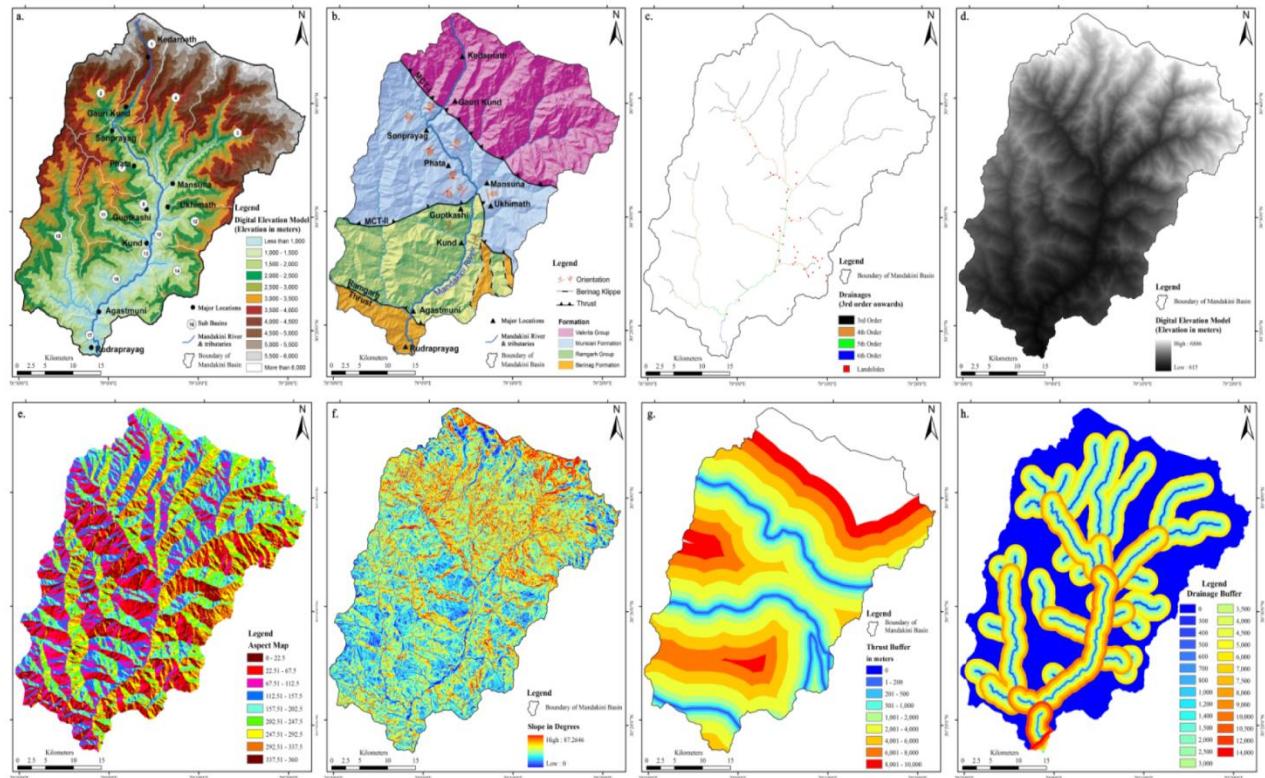
- The main purpose of Multiple Hazard Mapping (MHM) is to gather together in one map the different hazard-related information for a study area to convey a composite picture of the natural hazards of varying magnitude, frequency, and area of effect.



# Hazard zonation mapping



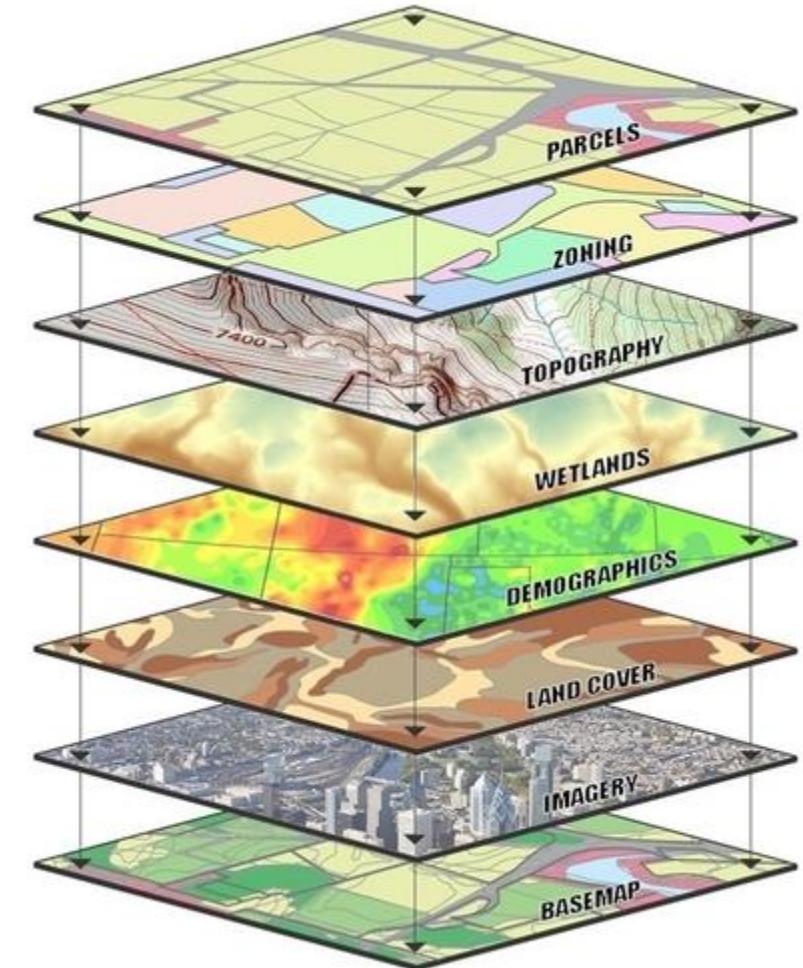
- The inducing or triggering factors which can interconnect several hazards can more easily be seen through the use of a MHM.





# PREPARING MULTIPLE HAZARD MAPS

- **Translated Information** – The information must be "translated" for planners and decision-makers and placed on maps
- **Sources and Compiling Information**
- **Timing**





# TYPES OF INFORMATION NEEDED TO ASSESS THE HAZARD POTENTIAL OF NATURAL PHENOMENA

|                          | EARTHQUAKE   | LANDSLIDE  | HURRICANES                | RIVER FLOODS   |
|--------------------------|--|--|---------------------------|--|
| LOCATION                 | Epicenters<br>Geologic formations<br>Slope                 | Inventories<br>Geologic formations                               | Landfall<br>Path          | Channel<br>Floodway<br>Floodplain<br>Elevation               |
| SEVERITY                 | Intensity<br>Magnitude<br>Acceleration<br>Displacement     | Velocity<br>Displacement   | Wind velocity<br>Rainfall | Volume<br>Velocity<br>Rate of rise                           |
| LIKELIHOOD OF OCCURRENCE | Recurrence interval<br>Slip rates<br>Historical seismicity | Earthquake recurrence<br>Rainfall patterns<br>Bank cutting rates | Historical occurrence     | Historical return periods<br>Flood of record<br>Design event |



# COMPILING INFORMATION ON MULTIPLE HAZARDS

- Collecting base maps and appropriate hazard information from the various sources identified.
- Evaluating the uniformity, accuracy, and completeness of such information-areal coverage, detail, content, elements (likelihood, location, and severity), format, and symbols.
- Selecting the most appropriate base map and scale to be used, hazards to be shown, and symbols to portray those hazards.
- Combining the selected individual hazard information onto the MHM in an accurate, clear, and convenient way.



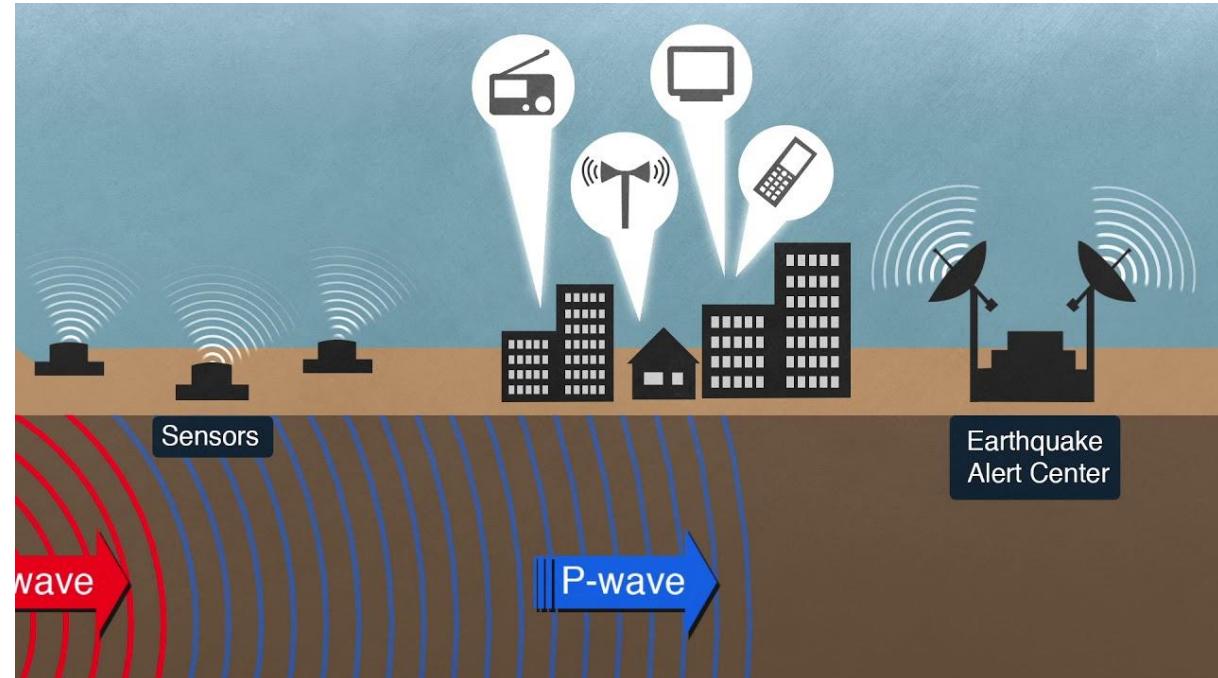
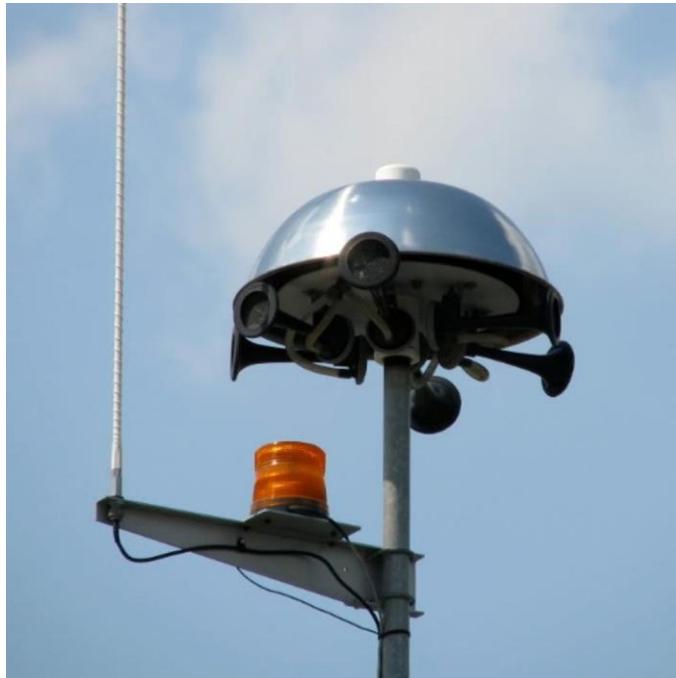
# BENEFITS OF MULTIPLE HAZARD MAPPING

- A more focus on the effects and impacts of natural phenomena on a particular area is possible.
- Many hazards and the trigger mechanism of each can be viewed at the same time.
- Study areas can be divided into sub-areas requiring more information, additional assessments, or specific reduction techniques.
- More realistic evaluation of risks to new development are possible.
- Appropriate hazard reduction techniques can be more easily built into the investment project formulation.
- Selection of appropriate land uses can become more rational.



# PREDICTION AND WARNING

- Predictions and warnings can also reduce damage and economic losses.
- Scientific and technological advances in recent decades have greatly improved the nation's capability to predict most natural hazards and disseminate warnings based on those predictions.





# Goal of Prediction Systems

- The upgrading of natural hazard prediction and warning systems through application of state-of-the art science and technology.
- Augmentation of research programs, models to predict their occurrence, and technology to detect and monitor them and to disseminate warnings.
- Expansion of research on the social aspects of effective warning messages.



# EARLY WARNING SYSTEM



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- An **Early Warning System** (EWS) can be defined as a set of capacities needed to generate and disseminate timely and meaningful warning information of the possible extreme events or disasters (e.g. floods, drought, fire, earthquake and tsunamis) that threatens people's lives.
- The purpose of this information is to enable individuals, communities and organizations threatened to prepare and act appropriately and in sufficient time to reduce the possibility of harm, loss or risk.



# CHARACTERISTICS OF EWS

- Effective early warning systems require strong technical foundations and good knowledge of the risks.
- But they must be strongly people centered – with clear messages, dissemination systems.
- Public awareness and education are critical; in addition, many sectors must be involved.
- Effective early warning systems must be embedded in an understandable manner and relevant to the communities which they serve.



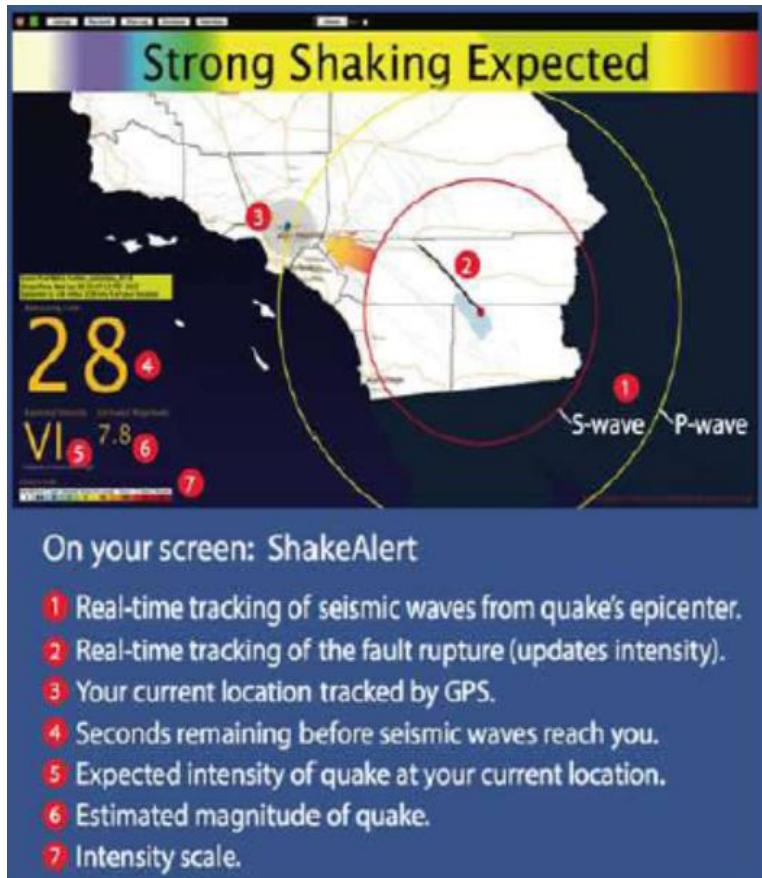
# AGENCIES FOR FORECASTING

| Disasters   | Agencies  |
|-------------|---|
| Cyclone     | Indian Meteorological Department                        |
| Tsunami     | Indian national centre for oceanic information services |
| Floods      | Central water commission                                |
| Earthquakes | Indian Meteorological Department                        |



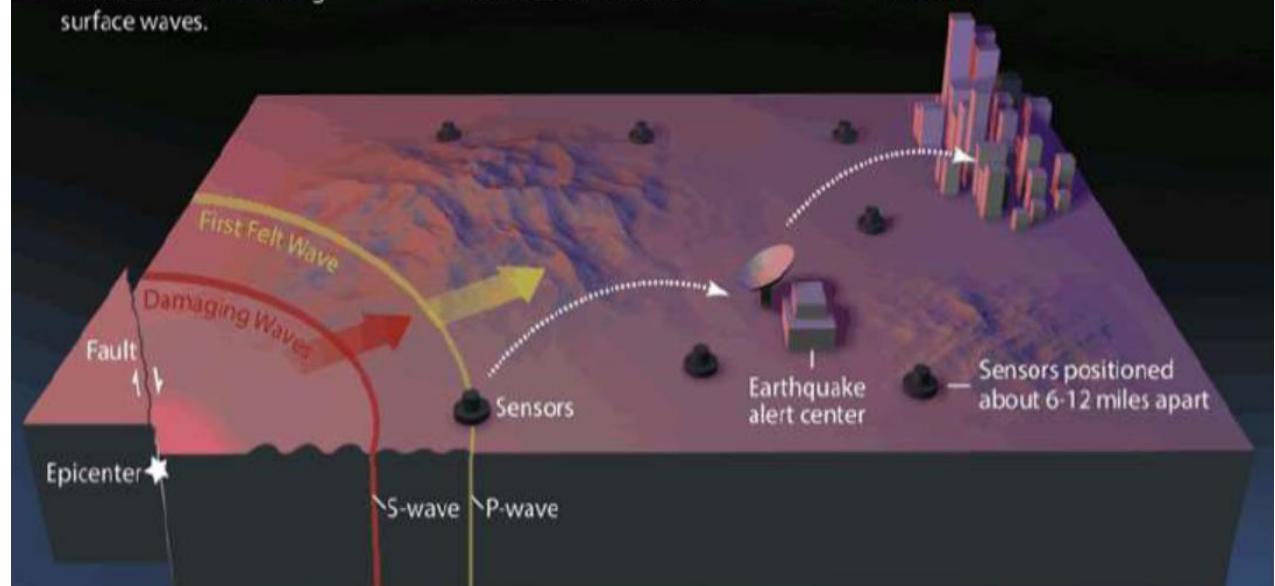
# Earthquake

- Shake Alert



## Earthquake Early Warning Basics

- 1 In an earthquake, a rupturing fault sends out different types of waves. The fast-moving P-wave is first to arrive, but damage is caused by the slower S-waves and later-arriving surface waves.
- 2 Sensors detect the P-wave and immediately transmit data to an earthquake alert center where the location and size of the quake are determined and updated as more data become available.
- 3 A message from the alert center is immediately transmitted to your computer or mobile phone, which calculates the expected intensity and arrival time of shaking at your location.





# Flood

- The Community-based Flood Early-warning System is used in Hindu Kush Himalayan region.
- The wireless system manages flood or flash flood risk by providing early warnings to downstream communities and enhances cooperation between upstream and downstream communities in the sharing of flood information.

## Community-Based Flood Early-Warning System

To enhance the resilience of at-risk communities to flood hazards, IDMOD, together with its partners Aastaryok (India) and SEE (Nepal), established the Community-Based Flood Early-Warning System project. The ICT-enabled system uses a flood sensor attached to a transmitter to detect rising water levels. When the water reaches a critical level, a signal is wirelessly transmitted to the receiver. The flood warning is then disseminated via mobile phone to concerned agencies and vulnerable communities downstream. Critical flood levels are set with the help of the local community.

### How it Works

The ICT-enabled system installed upstream sends warning signals to flood-vulnerable villages downstream when water reaches a critical level. This gives people time to move out of harm's way, saving lives and property.



### Early-Warning System

The warning system consists of sensors that wirelessly transmit information about river water levels to a receiver.



INDIA

**END**

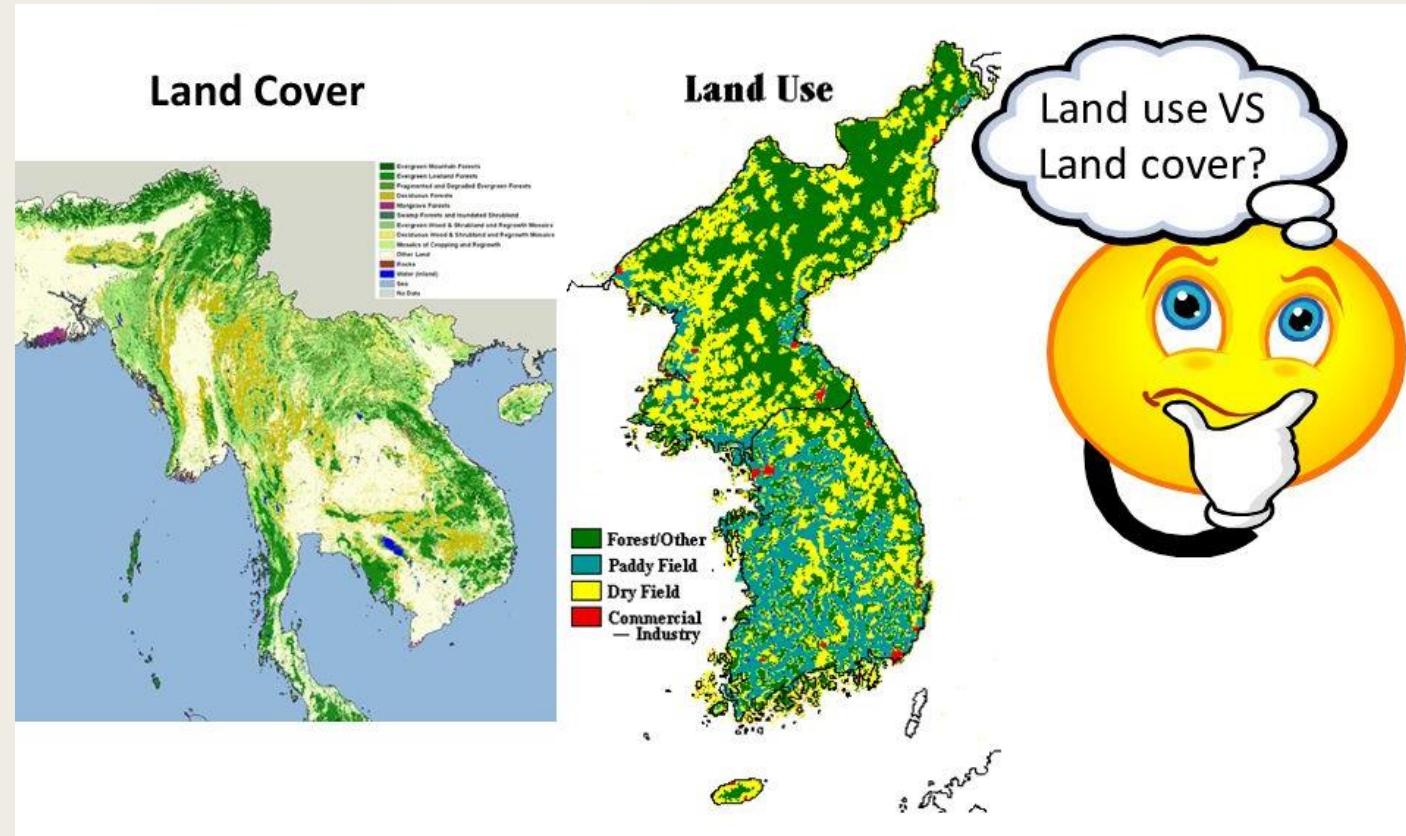


# **LAND-USE ZONING FOR DISASTER MANAGEMENT**

Unit -4

# Land use/Land cover

- **Land use** - Areas are classified based on the purpose the land serves: such as recreation, wildlife habitat or agriculture.
- **Land cover** - Areas are classified based on the surface cover on the ground whether vegetation, urban infrastructure, water, bare soil or others.



# Objectives of Land-use zoning

- Understand the relationship between land-use zoning and disasters.
- Know how faulty allocations of land-use can often become the cause of disasters, both man-made and natural.
- Describe how judicious land-use zoning can help not only in disaster mitigation, but also in disaster relief operations.

# Major elements of Land-use Planning

- Land-use policies and plans setting out the social, economic and environmental goals of comprehensive land development and their stages of development;
- Land ownership and land tenure patterns identifying the legal, social and economic basis of ownership and tenure
- Land values and prices, reflecting the forces of supply and demand for land and
- Land-use controls which may be subdivided into three broad categories, i.e., legal, fiscal and directive.

# Challenges?

- Less weightage is often given to disaster prevention in land-use policies.
- Traditional systems of land-use have over a long period adjusted to periodic disasters.
- Traditional and intermediate indigenous economic systems are highly sensitive to regulate and the economic costs or uprooting, relocating, or inhibiting development can be' very high in labour intensive employment sectors.
- Growth of population and land shortages have tended to make the poor poorer and affected the marginal land such as ravines, steep slopes, low flood plains or even riverbeds.



# ZONING CONTROLS

- Land-use Macro Zoning
- Land-use Micro Zoning
- Sub-division Regulations
- Building or Location Permits
- Open space Controls
- Building Codes

# Land Use Macro Zoning

- Macro zoning is the establishment of land use planning zones at regional levels.
- These zoning are an efficient tool to control the over-all location of various human activities.
- Macro zoning has a broad function in the reduction of risk since hazardous areas can be zoned permanently for agricultural or recreational uses, minimizing as far as possible for urban or semi-urban concentrations of population or industry.
- The demarcation of a country or regions into broad areas of natural hazard is useful for outlining general national policies in disaster prevention and mitigation.

# Land Use Micro Zoning

- Micro zoning is the detailed preparation of land use maps by local bodies and 'public authorities, particularly in urban settlements, fixing specific land - uses for each site (such as residential, educational, commercial, etc.).
- Micro zoning also details the density of land uses at particular sites.
- Furthermore, micro zoning establishes a detailed land use pattern within the natural hazard macro-zoning framework.
- From the point of disaster prevention, micro zoning is a basic tool which relates natural hazard assessment to land-use planning.

## **Sub-division Regulations**

- Sub-division regulations, like zoning, provide public control over the development of land. This is accomplished through approval of plans by the designated government authority where the criteria for approval establish restriction governing the exact way land is subdivided and the provision made for public facilities and infrastructure.

## **Building or Location Permits**

- Building and location permits provide planners and government officials with an opportunity to exercise micro-controls over development.

## Open space Controls

- Land use policies that regulate the location of agriculture or green area have a direct impact on the provision of open spaces in the total planning area "and vice-versa.

## Building Codes

- Building codes or building by-laws in the present context establish minimum standards of design, construction and materials in order to avoid structural collapse under conditions of severe physical stress caused by extreme natural phenomena to which that land might be vulnerable.

# LOCATION OF ACTIVITIES AND LAND USE

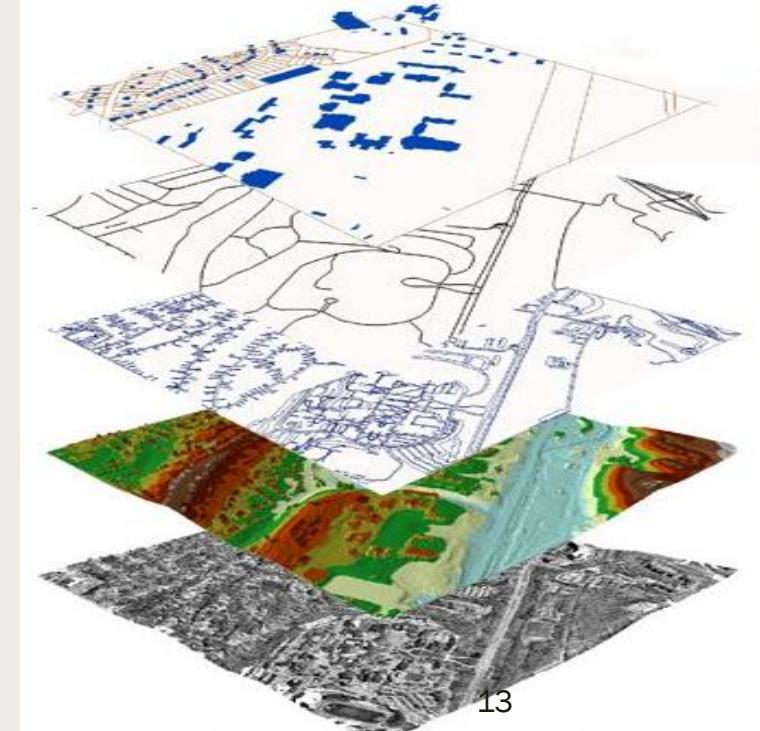
- Major functional land uses should be segregated and not mixed as far as possible.
- In order to diminish the risk of total paralysis of productive or administrative activities in disaster prone areas, the industrial and business zone should be decentralized.
- All important installations (ex: centres of communication, historical monuments) should be located in such way that they are well accessible and well protected.
- Density should be kept as low as possible

# Implications of town planning

- Urban planning is a state responsibility and as such the plans are prepared under the respective Town and Country Planning Acts.
- A broad zonal structural plan based upon risk zones identified. should be prepared before the overall land use plan. This will reduce the time lag between master plan and zonal plan preparation.
- Highrisk zones, which are consequently more vulnerable, should have lower Floor Area Ratio (FAR), wider set backs, more open spaces, and restriction on high rise development.
- The rear set back, in case of industrial plots, should be kept larger than the front set back to prevent factories from being built back to back which: reduces availability of open spaces for rescue operations.

# Application of Remote Sensing and GIS

- The data supplied by earth observation satellites can often provide information such as maps and images.
- Maps of watersheds, river and stream patterns and coastal plains can be produced and geographical maps can be complied.
- Flood plains and delineate areas of potential flood impact.
- IRS Satellites – Acquire the details of the surface
- GIS – Generate, manipulate and analyze maps



# Thanks

# DISASTER EDUCATION

## Unit 4



# Aim of Disaster Education

- The aim of the disaster education is to provide knowledge among individuals and groups to take actions to reduce their vulnerability to disasters.



# Sendai Framework for Disaster Risk Reduction (2015–2030)

- An international document which was adopted by UN member states between 14th and 18th of March 2015 at the World Conference on Disaster Risk Reduction held in Sendai, Japan and endorsed by the UN General Assembly in June 2015
- The need for population-wide resilience building and the enhancement of disaster preparedness for effective response and fast recovery, rehabilitation, and reconstruction was highlighted.



# Need for Disaster Education?

- Due to their limited predictability of the rapid-onset events such as floods, typhoons, volcanic eruptions, tsunamis, or earthquakes, these disasters can cause severe loss of life and major damages to property.



- Household preparedness measures
- Community level preparedness measures

# Central Concepts and Terminology

- Education- Formal and Non-formal
- Knowledge - Explicit and tacit
- Disaster education or disaster resilience education
  - Vulnerability
  - Susceptibility or exposure
  - Adaptive capacity
  - Resilience building

**Vulnerability and  
Resilience**

# Education

- Formal

Classroom-based education normally delivered in a structured environment, such as a school, college or university.

- Non-formal

Organized and structured educational activities that take place outside the established formal school system are referred to as non-formal education. These include community education or alternative learning programs, such as community-based disaster training and drills.



# Knowledge

- Explicit knowledge

Explicit knowledge can be clearly identified, accessed and verbalized.

- Tacit knowledge

Tacit knowledge, on the other hand, is implicit.



# Disaster Resilience Education

- **Vulnerability** to environmental hazards =  $f(\text{susceptibility}, \text{sensitivity}, \text{Adaptive capacity})$ .
- **Susceptibility** or **exposure** refers to the presence of people in places that are at risk of being adversely affected.
- **Sensitivity** relates to the degree to which a population group is negatively affected once a shock occurs.
- **Adaptive capacity** is the ability to cope with and adjust to consequences of natural hazards.

# Disaster Resilience Education

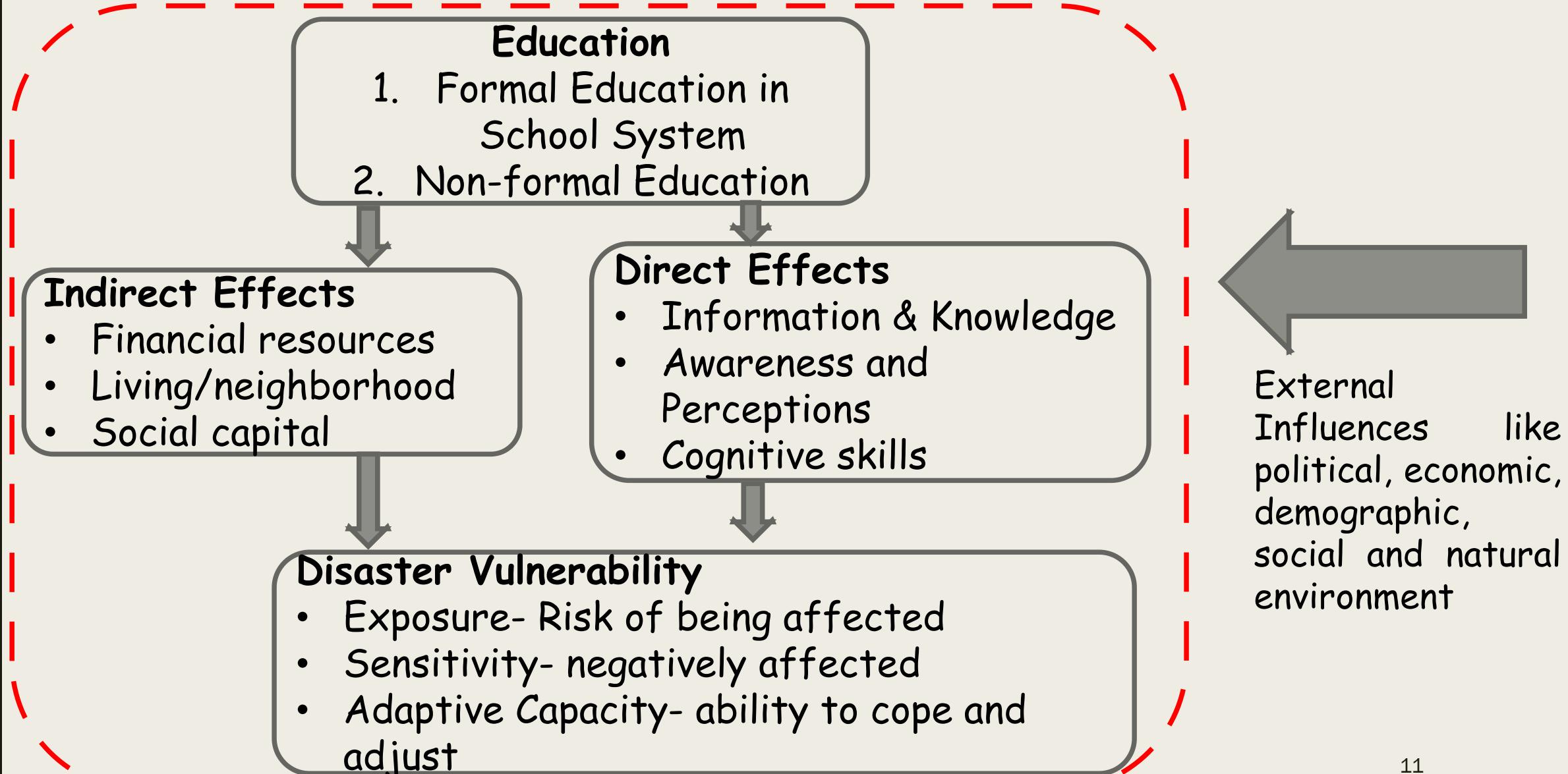
- The term resilience refers to the household's or community's abilities and resources to adequately prepare for, mitigate and cope with disruptive changes and events that may occur in an unforeseen way.
- Economic, social, demographic and institutional factors contribute.
- Among these, also education and the dissemination of knowledge and information can effectively contribute to resilience building efforts.

# Vulnerability and Resilience

- Vulnerability and resilience are both important for disaster risk reduction, which in the concept and practice of reducing disaster risks through systematic efforts, including the anticipation of future disaster risks, the reduction of existing exposures, hazards, and vulnerabilities, and the improving of resilience.



# The conceptual relationship between Education and Disaster vulnerability



# The main target group for Disaster Education

- Disaster education for vulnerable people
- Disaster education for children
- Disaster education for women
- Disaster education for the elderly and disabled people

# Conclusion

- It has been found that living in a community with a higher level of education significantly increases preparedness actions.
- The non-formal or social learning in the affected communities play an important role.
- Besides formal and non-formal disaster education, informal interventions play an important role in strengthening people's preparedness and resilience.
- Interventions can include creative educational materials, such as games, documentary and short videos, cultural and performing arts, such as songs, puppetry and improvisation theatre, as well as projects bringing students in contact with local communities and governments.
- These practical approaches can help foster the development of analytic and problem-solving skills among the learners.

Thanks for the attention

# **POST DISASTER - SEARCH AND RESCUE, IMMEDIATE RELIEF, AND ASSESSMENT SURVEYS**

Unit -4

# Search and Rescue (SAR)

- Termed as “helpful behavior in emergencies”.
- Search and rescue is a technical activity rendered by a group of specially trained personnel.
  1. Community Local Rescuers
  2. Outside Community Resources



# Objectives of SAR

- To rescue the survivors trapped under the debris, from the damaged buildings or from a cyclonic storm surge, flood, earthquake and fire.
- To provide First Aid services to the trapped survivors and to dispatch them for medical care.
- To take immediate necessary actions, as necessary, for temporary support and protection to endangered collapsed buildings to structures.
- To hand-over, recover and dispose-off the bodies of the deceased.
- To train, demonstrate and raise awareness on how to use the local materials for self-rescue amongst the community people.

# Team Composition

- Physically and Psychologically sound volunteers could constitute a rescue team.
- Above 18 years of age, with a minimum education level should be selected.
- Preference would be given to ex-military or army personnel.

Team leader: 1

Skilled persons: 2

Members: 5



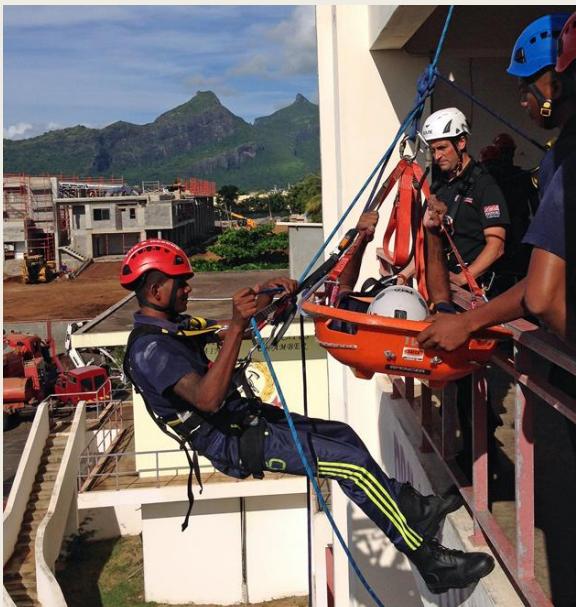
# Duties of the Rescuer

1. Assessment
2. Information
3. Observation – LLF – Look, Listen and Feel

# Plan for Rescue

■ Rescue is a team effort that needs coordination and planning amongst the members for an optimum response operation.

1. Manpower
2. Equipments
3. Methods



# Rescue Stages

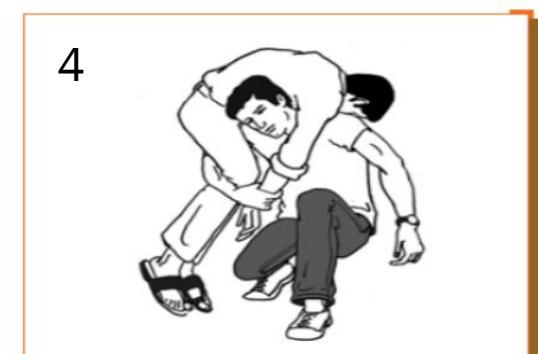
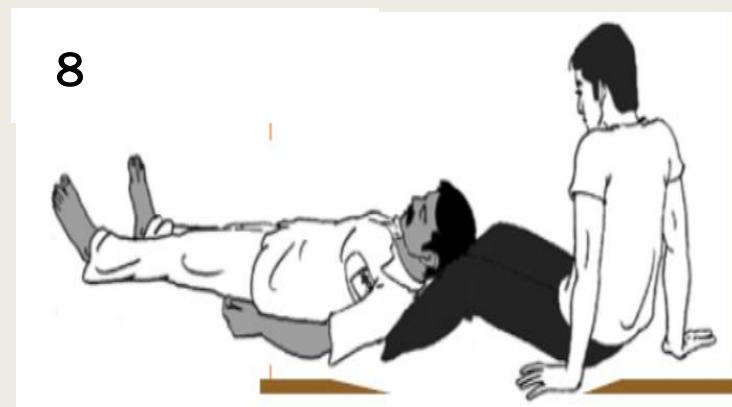
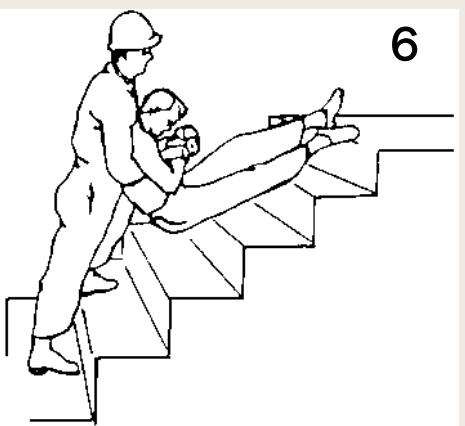
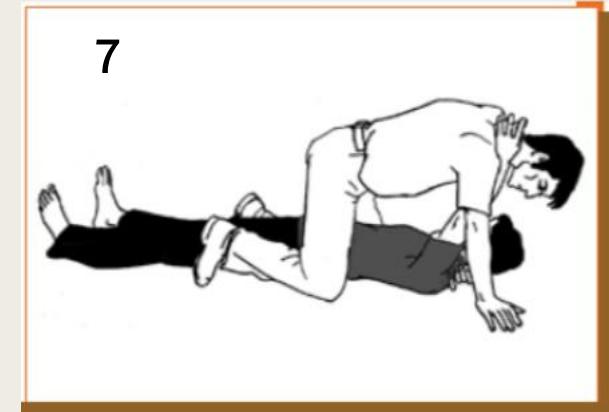
- **Stage 1** - Surface Causality (Emergency Rescue)
- **Stage 2**- Search in Slightly Damaged Buildings (Immediate Rescue)
- **Stage 3**- Search of Possible Survival Points (Specialised Rescue)
- **Stage 4** -Selected Debris Clearance (Specialised Rescue)
- **Stage 5** -General Debris Clearance (Specialised Rescue)

# EMERGENCY RESCUE Methods

- Rescues with One Rescuer
  - 1. Human Crutch.
  - 2. Pick-a-back
  - 3. Pick-a-Back (Reverse)
  - 4. Fireman's Lift
  - 5. Rescue Crawl
  - 6. Removal Downstairs
  - 7. Bowline Drag
  - 8. Toe Drag
- More than Two Rescuers
  - 1. Two-Handed Seat
  - 2. Three-Handed Seat
  - 3. Four-handed Seat
  - 4. Fore and Aft Method
  - 5. Two-Person Human Crutch
- Clothes lift
- Blanket Lift

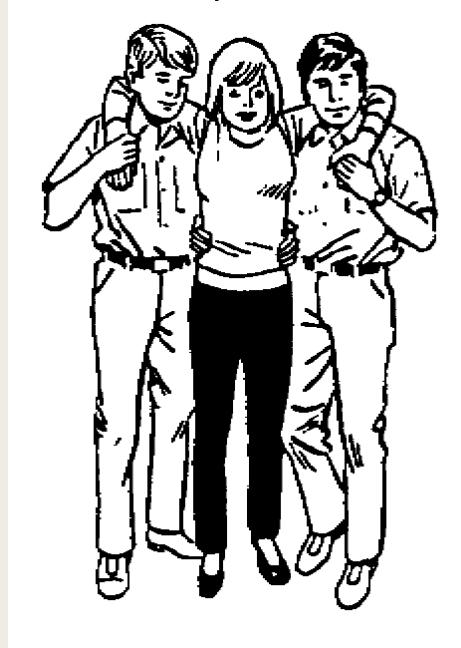
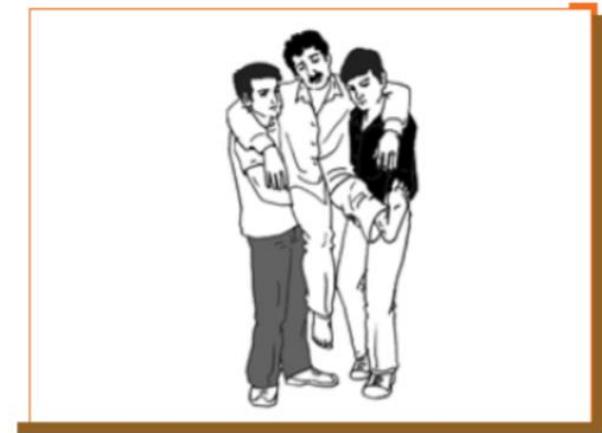
## ■ Rescues with One Rescuer

1. Human Crutch.
2. Pick-a-back
3. Pick-a-Back (Reverse)
4. Fireman's Lift
5. Rescue Crawl
6. Removal Downstairs
7. Bowline Drag
8. Toe Drag



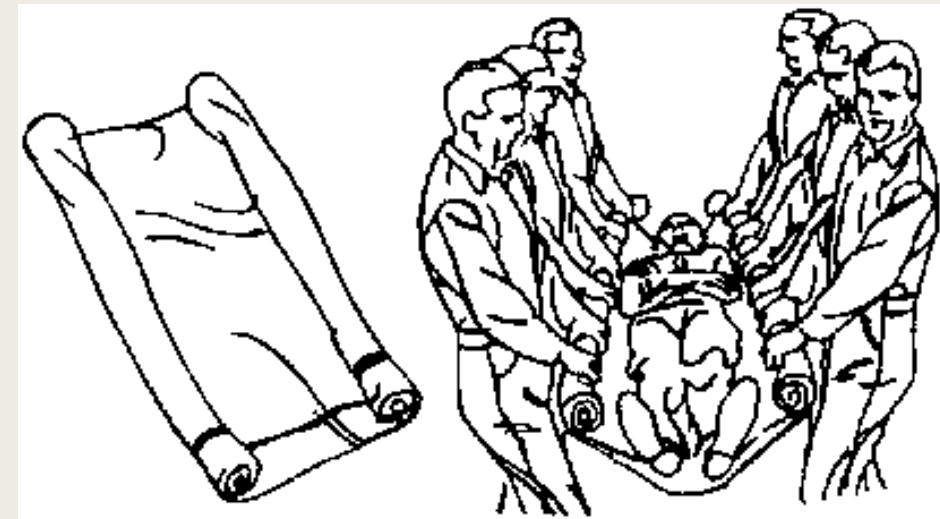
## ■ More than Two Rescuers

1. Two-Handed Seat
2. Three-Handed Seat
3. Four-handed Seat
4. Fore and Aft Method
5. Two-Person Human Crutch



# Clothes lift

- This method is applicable when the casualty is found in a condition that he /she cannot move himself /herself nor any equipment is available with the rescuers for transportation of the casualty.



# Blanket lift

Casualty is found in a grave condition and need to be shifted in flat condition, but the rescuers do not have a stretcher to carry the casualty.



Step 1



Step 2

# Triage and first response

- During medical triage; victims are evaluated, sorted by the urgency of the treatment.
- Triage was, in fact, initiated by the military and that experience has shown that triage is an effective strategy in situations where:
  1. There are many more victims than rescuers
  2. There are limited resources
  3. Time is critical

- **Immediate (I)**: Victim has life-threatening injuries (airway, bleeding, or shock)
- **Delayed (D)**: Injuries do not jeopardize victim's life; treatment can be delayed
- **Minor (M)**: Walking wounded and generally ambulatory
- **Dead (DEAD)**: No respiration after two attempts to open airway

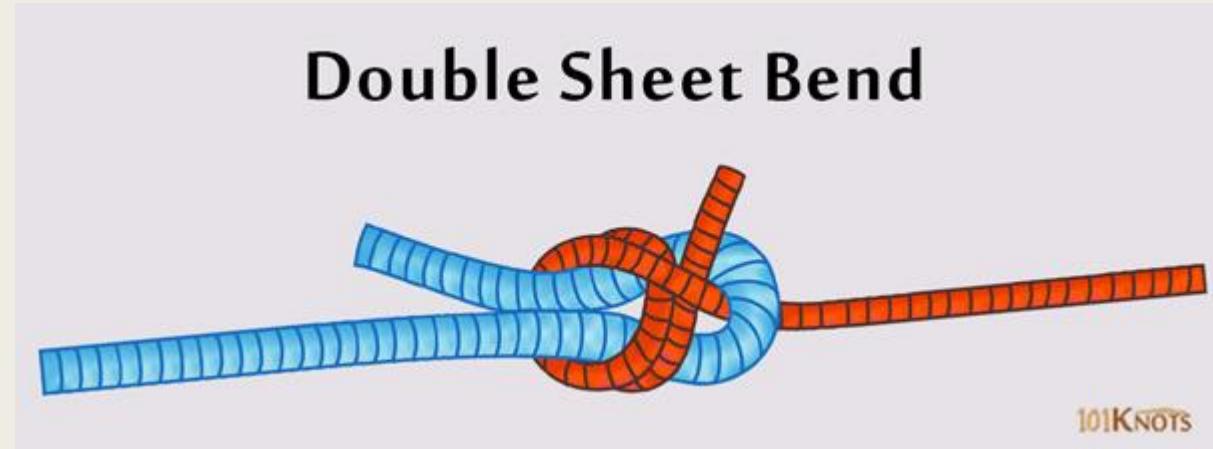
# WATER RESCUE

- Flood and cyclone disasters take thousands of human lives every year; rescue from water related disasters is one of the important challenges for the rescuer. The rescuers must be equipped with swimming and floating aids and should have adequate swimming capacity for rescuing the drowning casualty. The rescuers must have knowledge and practice of swimming in order not to risk himself /herself whilst rescuing the victims.



# RESCUE FROM DAMAGED BUILDING

- Double Sheet-Bend
- Chair-Knot
- Lashing



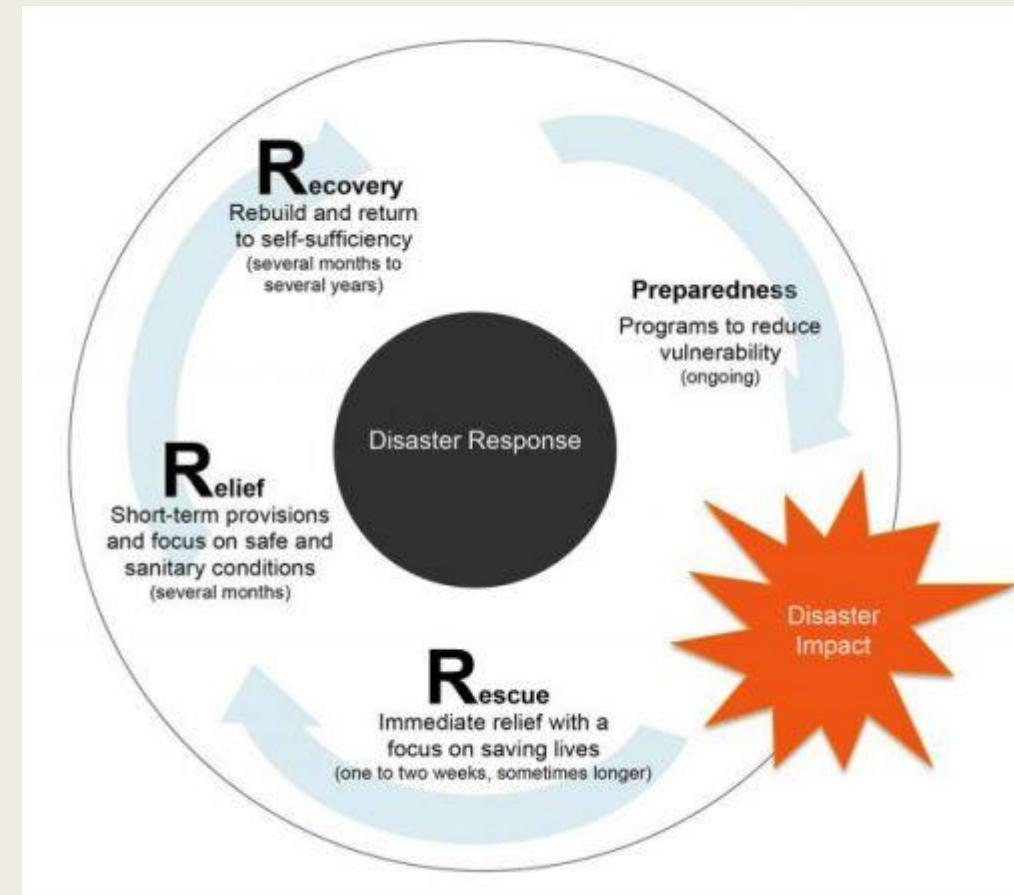
# STRETCHER AND CASUALTY TRANSPORTATION

- Wounded casualty is to be transported with utmost safety to avoid further risk. It may happen that the trained rescuers have to rescue the causalities from a collapsed structure, to from a confined place, or on the uneven ground with obstacles.
- Different techniques are required for different ground conditions. The knowledge of First Aid Services and adequate transportation of the casualty is important for the rescuers.
- In case of shock or serious injuries, the patient needs warmth, which could be provided by using blankets.



# IMMEDIATE RELIEF

- This is a coordinated multi-agency response to reduce the impact of a disaster and its long-term results. Relief activities include rescue, relocation, providing food and water, preventing disease and disability, repairing vital services such as telecommunications and transport, providing temporary shelter and emergency health care.



# Why to conduct a Rapid Assessment?

- To locally assess the disaster-affected areas and the needs of disaster victims.
- One must fight that initial impulse, and first conduct an initial rapid assessment.
- This improves the quality and speed of response.
- Without a rapid assessment, not only wastes precious resources at a time of great need, but can also be a cause of further burden to the affected population.
- The initial rapid assessment is conducted as early as a few hours after the onset of a disaster, and should be completed within 3 days at the latest.



# Rapid Assessment Checklist

## 1. Security and Access

- Route(s) to the location
- Damage severity
- Road accessibility, building collapse
- Secondary disaster: chemical disaster, fire
- Pipeline damage: gas, water, sewerage
- Ongoing safety and security concerns
- Weather conditions
- Phone/internet connectivity

## 2. Population Affected

- Population before disaster
- Number of populations displaced
- Estimated sex ratio
- Age profile: children under 5 years of age
- Vulnerable groups with special needs
  - Dialysis patients, oxygen-dependent patients, immobile elderly, unaccompanied minors, pregnant women, etc.

## 3. Community resources

- Community disaster infrastructure
  - Emergency warning system
  - Community disaster plan and drills
  - Pre-designated shelters
- Means of transportation
- Means of communication
  - Mobile phones, landlines, internet, television, radio

## 4 to 7. Mortality and Health Impact

- Mortality (crude mortality rate, under 5 mortality rate)
- Main diseases and morbidity
- Damage and impact to medical facilities, staff, and supplies
- Public health infrastructure (surveillance, immunization)
- Damage to emergency medical services
- Child health

- Reproductive health (emergency obstetric care, prevention of sexual violence)

## 8. Water

- Water source
- Water distribution system
- Water storage
- Distance from homes to water source
- Water testing system

## 9. Sanitation

- Toilet facilities
  - Types
  - Number
  - Location (distance from shelter/housing)
  - Lights, locks
  - Maintenance
  - Menstrual hygiene materials
- Sanitation
  - Lavatories, buckets, warm water, shower
  - Privacy in bathing/washing space

## 10. Food and Non-food items

- Food supply and calorie intake
- Cooking (self-preparation, communal kitchen)
- Food sources, staples, and food storage methods
- Essential items for daily living
  - Water containers, blankets, bedding/mattresses, soaps, cooking tools and equipment (e.g., utensils, stoves, etc.), lighting, heating/air-conditioning equipment
  - Electricity, gas, and gasoline supplies

## 11. Shelter (including temporary housing)

- Status and need for temporary shelters
- Number of shelters and each capacity
- Covered area
- Availability of partitions (family-based or for different sex)

# Sources and Methods of Data collection

- Assess the general layout (Pre and Post-disaster) – Remote Sensing
- Estimate the number of affected people and local infrastructures and resources
- Living conditions, sanitation, water supply, food supply, health and healthcare services, and level of insecurity
- The degree to which “normal life” and social structure have been disrupted
- How well the affected population is coping

# Outcome of the Assessment

- What is most important in disaster relief
- Create a prioritized list of recommendations for response
- Complete information can save the time and/or reduced security and safety constraints.
- The results of the assessment must also be shared with other disaster relief organizations and relevant sections of the local governments to cross check information and to appropriately coordinate the response

Thanks

# **POST DISASTER – REHABILITATION (SOCIAL AND ECONOMIC ASPECT)**

**Unit 4**

# Introduction

1. Pre-disaster stage
2. Emergency stage or during disaster stage
3. Long-term post-disaster stage.

# REHABILITATION

1. Housing and Infrastructure Redevelopment.
2. Social Rehabilitation Programmes.
3. Economic Rehabilitation Programmes.
4. Other Related Programmes and Activities.

# REHABILITATION: SOCIAL ASPECTS

1. Strengthening/Re-strengthening of existing health facilities and infrastructure.
2. Rehabilitation of educational activities within the disaster affected region.
3. Rehabilitation of women and children affected by the disaster.

# Strengthening/Re-strengthening of existing health facilities and infrastructure

## Major Challenges

- Lack of communication between various functionaries, hospitals and even among the concerned officials.
- Shortage of sufficient accommodation for indoor activities for different operations related to efficient discharge of health facilities and even to store the medicines properly.
- An additional demand for different types of equipment and related materials within the disaster-affected area.
- Improper and inefficient facilities for necessary electric power supply to carry out the necessary tasks related to health facilities.
- Lack of trained staff to handle the mental health or trauma cases effectively.
- Lack of trained manpower to help in the rehabilitation services in the form of physiotherapy and occupational therapy.
- Lack of efforts and coordination related to sustainable disaster management
- Lack of overall training in handling disaster healthcare in a professional manner.

# Solution?

- Adequate preparedness and pre-disaster planning and training.

# Rehabilitation of educational activities within the disaster affected region

- Counselling and encouraging the children to attend the schools regularly
- Assisting the administration in providing the writing materials, work books etc. to the children
- Helping the school administration for ensuring the participation and cooperation of the children in all activities of the school
- Developing an atmosphere for students to seek knowledge and information
- Inculcating conducive attitudes among the students to play a positive role in self-development
- Establishing village level education committees for properly running the schools within the villages, and
- Arranging for volunteer teachers wherever the disaster has resulted in shortage of teachers.

# Rehabilitation of women and children affected by the disaster.

- Women and Children should, as far as possible, be resettled/rehabilitated in familiar environs.
- An attempt- must be made to rehabilitate the widows and orphans within their extended family or in a foster family in case of orphans.
- The mental health of such affected groups must be strengthened through programmes of regular counselling.
- The economic independence of widows must be ensured with the help of suitable programmes.
- The Proper health, nutrition and hygiene aspects must be taken care of within the long-term rehabilitation of the women and children groups.

# REHABILITATION: ECONOMIC ASPECTS

- Agricultural rehabilitation of disaster affected area
- Rehabilitation of artisans and marginal businessmen affected due to the disaster, and
- Rehabilitation of animal husbandry in the area affected due to the disaster.

# Agricultural Rehabilitation of Disaster Affected Areas

## 1. Short-term Measures for Agricultural Rehabilitation

- The short-term measures for agricultural rehabilitation include the sowing of the next crop after the disaster and harvesting of the remaining portion of the crops affected by the disasters.
- Cash grant or loan will be needed to be made available to the farmers.
- provide fertilizers to the affected farmer families.

## 2. Long-term Measures for Agricultural Rehabilitation

- In addition to the provision of free fertilizers and seeds, the necessary equipment /tools must also be provided.

# Rehabilitation of artisans and marginal businessmen

- It becomes necessary to provide them with small work sheds, necessary tool kits and soft loans to enable them to secure raw materials and to market the final/finished products.
- Starting the rural industrial units at the block level within disaster affected areas.
- Rehabilitation process should not disturb their traditional customs or life styles.
- A large number of small businessmen like small shopkeepers, tea stall owners, flour mill owners, etc., might have suffered damage to their respective units. The rehabilitation of all such affected people under this category should also have the provision of monetary loans on easy terms apart from some cash as outright grant.

# Rehabilitation of Animal Husbandry Affected due to Disasters

- Replacement of the dead milch cattle to the affected farmers.
- Free cattle feed for about 2 to 3 months.
- Preventive medication for entire livestock to check the -spread of any disease among the surviving cattles.

Thank you – End of Unit 4 Revision