# MCN 301
# Disaster Management

Module I

Disaster

# Module I

**Definition and meaning of key terms in Disaster Risk Reduction and Management- disaster, hazard, exposure, vulnerability, risk, risk assessment, risk mapping, capacity, resilience, disaster risk reduction, disaster risk management, early warning systems, disaster preparedness, disaster prevention, disaster mitigation, disaster response, damage assessment, crisis counselling, needs assessment.**

# Disaster

- Disaster is a catastrophic situation causing damage to life and property.
  - Natural
    - Earthquakes, floods, tsunamis etc
    - Can be predicted to an extent
  - Man made (Anthropogenic)
    - Transport & other accidents, radiation hazards etc
    - Can not be predicted
- High impact on the environment and ecology of a region.

# Impact of Disasters

# Definition of Key Terms in Disaster Risk Reduction and Management

- **Disaster**
  - 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.
  - Disaster is a result from the combination of hazard, vulnerability insufficient capacity or measures to reduce the potential chances of risk
  - A disaster happens when a hazard impacts on the vulnerable population and causes damage, casualties and disruption

# Characteristics of disasters

- Disaster is an outcome of a hazard event
- The disaster event has spatial boundaries (such as a community)
- The event results in large human and material losses and damages
- The affected community is unable to cope with its own resources

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- **Hazard**
  - A phenomenon, condition, situation, event, human activity or substance that has the potential to cause injury to life or health, damage to property or the environment, or disruption of livelihoods and social services.
  - The *potential* to cause harm is the hazard.
  - Natural or Human-induced.

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- **Types**
  - Biological hazards arise from organic materials, living organisms (such as disease vectors), toxins and other bioactive substances.
    - An example is epidemic diseases.
  - Geological hazards originate from processes or phenomena internal to the Earth,
    - Volcanic eruption and earthquake.
  - Hydrometeorological hazards result from atmospheric, hydrological and oceanic processes.
    - Examples include hurricanes, drought, tornado, and floods.
  - Technological hazards arise from technical or structural failures, industrial conditions and dangerous procedures.
  - Note that combinations of these are possible.

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- **Exposure**
  - The nearness of people, properties or communities to a hazard zone in space and time to suffer potential impacts.
  - Houses and people close to an earthquake zone or at the epicentre are more exposed than those far away.
  - However, a person living at the epicentre, but was away when an earthquake happened, would avoid personal injuries or death as opposed to a visitor who was at the premises.

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- **Vulnerability**
  - The degree to which a system, such as a community, is susceptible and exposed to the adverse effects of a given hazard.
  - It is a condition that predisposes individuals, groups, communities or systems to hazard event.
  - Vulnerability depends on the physical, socio-economic and environmental characteristics and circumstances that make the target system or community susceptible.

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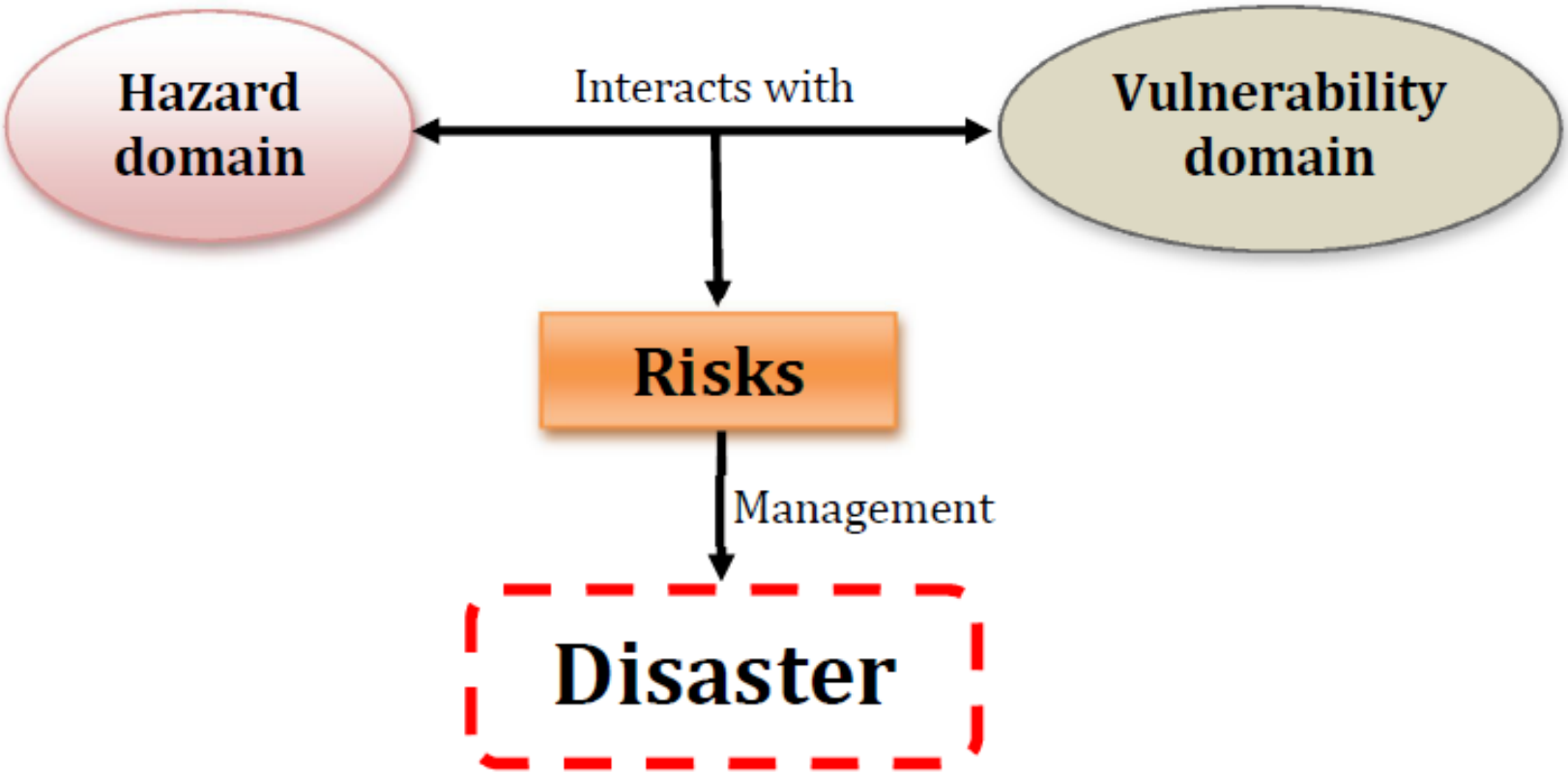
- **Risk**
  - The probability that a hazard event will occur and cause damages or losses at a given place and time.
  - It is a combination of the possibility of a hazard happening, the vulnerability of the target system to the hazard and the scale of damage that can occur.
  - Disaster occurs when a hazardous event results in large scale or widespread damages or disruptions.
  - Since risk is a probability, it can be calculated from past events.


Hazard domain
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- **Risk assessment**
  - A systematic approach to identify, quantify or simulate risks associated with hazards and existing conditions of vulnerability in order to reduce uncertainty.
  - Risks can be identified and quantified as the product of hazard and vulnerability in a given context.
  - Risks can be simulated by developing different scenarios of hazard-vulnerability interactions to assess potential damages. This can be done using simulation models.

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- **Risk map**
  - Identifies the places and structures in a community or geographical zone that might be adversely affected in the event of a hazard.
  - Risk mapping is the process that leads to the production of a risk map.

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- **Capacity**
  - The combination of all the strengths, attributes and resources available within a community, society or organisation that can be used to achieve agreed goals.
  - Coping capacity is the ability of people, communities or organisations, using available resources and skills, to face and manage adverse conditions that potentially could lead to a disaster.

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- **Resilience**
  - The ability of a community or system to resist, absorb, or recover from the effects of hazards in a timely and efficient manner, preserving or restoring its essential basic structures, functions and identity.
  - It is the ability of the community to bounce back to normal functioning after suffering a distress from a hazard event.

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- **Disaster risk reduction**
  - A systematic and continuous analysis and redressing of the causal factors of disasters.
  - It is the first step and key component of disaster (risk) management.
  - It should be deliberate and proactive; not episodic (occasional or conveniently) and reactionary.
  - Disaster risk reduction efforts and activities are normally specified in a formal document called disaster risk reduction plan prepared by an appropriate entity or authority.

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- Disaster risk reduction involves structural and non-structural measures.
  - *Structural measures* include the use of physical or engineering solutions (such as ocean wave barriers or earthquake resistant buildings) to avoid disaster or reduce its impacts.
  - *Non-structural measures* involve the use of policies, laws, education and awareness creation, and practices to avoid or reduce the impacts of disaster.

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- **Disaster risk management**
  - A structured approach to manage uncertainty and potential adverse impacts from a natural hazard event, through a process of risk assessment and the development of strategies and specific actions to control and reduce risks.
  - It is systematic, institutionalised, and covers both strategic and operational issues related to reducing vulnerability and exposure to hazards while increasing coping and response capacity.
  - Risk management is about dealing with uncertainty.

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- The purpose of disaster risk management is to prevent, reduce or transfer the adverse effects of hazards.
  - Comprises prevention, mitigation and preparedness. That is, disaster risk management (all measures and preparations done ahead of a hazardous event (or disaster)).
- It addresses both current and future risks (corrective and prospective risk management, respectively).

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- **Early warning system**
  - A socio-technical system designed to generate and circulate meaningful warning information in a timely manner to enable a target system take a proactive response to a hazardous threat in order to avoid disaster or reduce its impacts.
  - An early warning system comprises all the steps from detection of the threat, through communication to target community or people, to the ability of the target to understand and respond appropriately to the warning.

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- **Disaster preparedness**
  - Consists of the knowledge and capacities of institutions, communities and individuals to effectively anticipate, respond to, and recover from the impacts of likely, imminent or active hazard events or conditions.
  - Preparedness is incomplete if potentially affected people are not aware of the threat of a hazard.
  - Preparedness is embedded in disaster risk management.

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- **Disaster prevention**
  - The elimination or reduction of the likelihood of occurrence of natural hazard event, or their adverse impacts.
    - Examples include flood protection embankments.
- **Disaster mitigation**
  - A set of measures to reduce or neutralise the impact of natural hazards by reducing social, functional, or physical vulnerability.
- **Disaster response (relief)**
  - The provision of assistance or intervention through the emergency services during or immediately after a crisis in order to save lives, reduce further impacts on health and public safety and to meet the basic subsistence needs of affected populations.

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- **Damage assessment**
  - The procedure for determining the magnitude of damage caused by a disaster or emergency event. Damages are normally classified as:
    - Severe: the target facility or object cannot be used for its intended purpose. Complete reconstruction is required.
    - Moderate: the target facility or object cannot be used effectively for its intended purpose unless major repairs are made.
    - Light the target facility or object can be used for intended purpose but minor repairs would be necessary.

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- **Crisis counselling**
  - The process of alleviating the emotional and psychological disturbances of persons affected by disaster in order to restore a sense of control and mastery and to aid the process of recovery and reconstruction.
  - Normally, disasters overwhelm the physical and psychological capacity of people to cope.
    - This can lead to emotional and psychological disturbances which can affect a person's ability to make right decisions or adopt reasonable responsive actions.
  - Crisis counselling addresses these problems and is a crucial part of recovery and reconstruction.

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- **Needs assessment**
  - A process of estimating (usually based on a damage assessment) the financial, technical, and human resources needed to implement the agreed-upon programmes of recovery, reconstruction, and risk management.
  - *Post-damage needs assessment* is normally a rapid, multi-sectoral assessment that measures the impact of disasters on the society, economy, and environment of the disaster-affected areas.