
UNIT 6 DISASTER MANAGEMENT CYCLE WITH FOCUS ON PREPAREDNESS, PREVENTION AND MITIGATION*

Structure

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6.0 OBJECTIVES

After reading this Unit, you should be able to:

- Understand the disaster management cycle and its stages;
- Examine the concept and principles of disaster prevention;
- Elaborate the disaster preparedness measures and its types; and
- Explain the concept of disaster mitigation and discuss its approaches.

6.1 INTRODUCTION

Disaster management measures in earlier times were oriented mostly to the relief measures, wherein items of relief are distributed to the victims after the disaster. However, there was a realisation in later times on disaster management and it was felt that rather than serving the needs of the victims after a disaster happens, it is better to engage in prevention and mitigation measures which can contribute towards not only preventing huge loss of life and property, but also contribute towards preventing huge burden on the exchequer.

Both at the international and national level, the approach towards disaster management has changed and the focus is on concentrating on the disaster management cycle and promoting the culture of disaster risk prevention and mitigation. In this Unit,

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you will be introduced to the Disaster Management Cycle, which encompasses various stages viz. pre-disaster, during-disaster and post-disaster. Rather than focusing on the post-disaster measures, emphasis has been made on the pre and during-disaster measures which cover aspects such as prevention, preparedness and mitigation.

6.2 INTERNATIONAL AND NATIONAL APPROACH TOWARDS DISASTER

As stated earlier, the initial measures of disaster management only meant distribution of relief to the victims. It was only after the Yokohama Strategy for Disaster Reduction in 1994 that the approach at the international level took a shift from relief to mitigation and prevention. The Yokohama Strategy states that “disaster prevention, mitigation and preparedness are better than disaster relief as the latter only leads to temporary results with high costs, while the former contributes to lasting improvement in safety thereby focusing on integrated disaster management” (UNISDR, 1994). The same point has been reiterated by UNICEF (2016), which states that, on an average “every \$1 spent on preparing is worth more than \$2 in the emergency response, and that preparedness saves responders over a week of operational time – doubling the impact of donors’ and taxpayers’ contributions”.

In the Indian context too, the approach towards prevention and mitigation can be found in the Disaster Management Act of 2005. The Act states that the National Plan shall include:

- i) measures to be taken for prevention of disasters or the mitigation of their effects;
- ii) measures to be taken for the integration of mitigation measures in the development plans;
- iii) measures to be taken for preparedness and capacity building to effectively respond to any threatening disaster situations or disaster; and
- iv) roles and responsibilities of different Ministries or Departments of the Government of India in respect of measures on the three aspects mentioned above (Government of India, 2016).

Thus, the shift in approach can be observed both at the international as well as national level and the core objective of India towards disaster management is to promote the culture of disaster risk prevention and mitigation at central, state and local levels.

6.3 DISASTER MANAGEMENT CYCLE

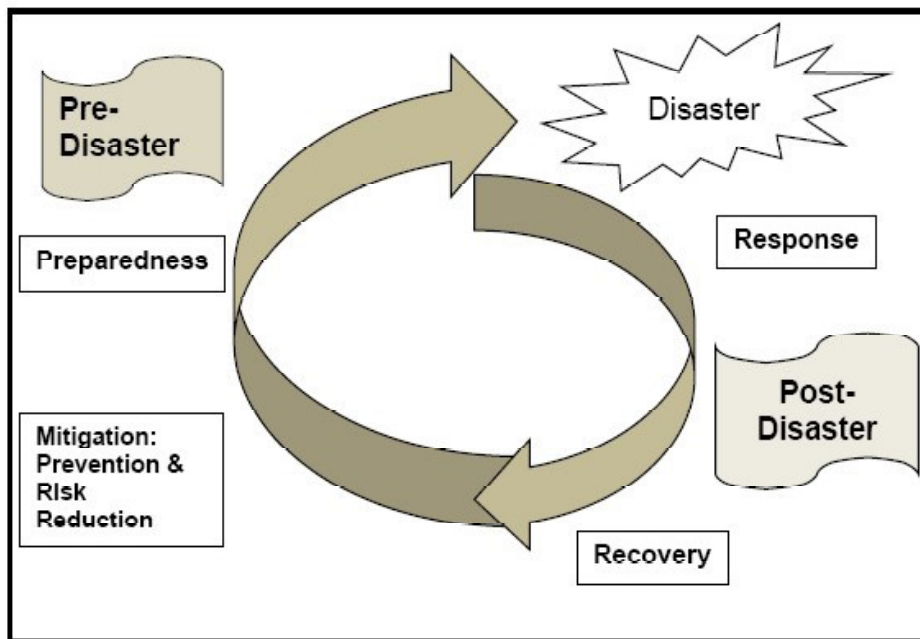
Disaster Management is not a single entity. It involves so many actions and actors as a disaster is not confined to any particular area/ location. It can happen anywhere and at any time, which is so sudden and it makes enormous damage to the lives of the people and the infrastructure. In managing disaster situation, emphasis has been made on the Disaster Management Cycle, which is a new approach to look into disasters in a holistic way. The Disaster Management Cycle thus:

- integrates various isolated activities, attempts and different actors;
- shows new path in handling disasters, which makes a shift from relief-oriented approach to proactive approach.

As per Disaster Management Act, 2005, “Disaster Management” means a continuous and integrated process of planning, organising, coordinating and implementing measures which are necessary or expedient for – (i) prevention of danger or threat of any disaster; (ii) mitigation or reduction of risk any disaster or its severity or consequences; (iii) capacity building; (iv) preparedness to deal with any disaster; (v) prompt response to any threatening disaster situation or disaster; (vi) assessing the severity or magnitude of effects of any disaster; (vii) evacuation, rescue and relief; and (viii) rehabilitation and reconstruction. All these components mentioned in the Act are not an isolated or single activity and should be holistic, integrated and interconnected. Hence these components should be inbuilt into the development programmes for effective disaster management. Such effective disaster management is based upon the partnership among the Central, State and Local levels to ensure the protection of the people through measures of proper preparedness, mitigation, response, relief, recovery and rehabilitation.

Stages of Disaster Management Cycle

The Disaster Management Cycle can be divided into three stages, that is, Pre-disaster, During-disaster and Post-disaster.



Source: Government of India, 2016.

Pre-disaster: Preparedness, Prevention and Mitigation are the major activities in pre-disaster stage. It is based upon the principle that prevention is better than cure. In this stage, various preventive measures and activities are undertaken well in advance so as to respond to disasters in an effective way. Much of the disastrous effects could be avoided, if we are well equipped with preparedness, prevention and mitigation measures and give serious attention to the early warnings. Pre-disaster activities should, thus, concentrate on creating disaster resilient structures and communities. For example, in India, cyclones are a common phenomenon that occurs and warnings are generally given beforehand. If preparatory activities can be undertaken well in advance, then it becomes easy to prevent huge losses in terms of lives and property, in the aftermath phase.

During-disaster: Response and Relief are the important activities in the during-disaster stage. It will start in the aftermath of a disaster. It includes immediate

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activities like search, rescue and evacuation, identification of and management of dead bodies and debris management, provision of first-aid, food, water, shelter, safety and security, health care and sanitation, restoration of basic facilities, etc. For example, when the Indian Ocean Tsunami struck in 2004, one can reflect that all these measures were undertaken immediately.

Post-disaster: The major activities in the post-disaster phase include: Rehabilitation, Reconstruction and Recovery. These activities will ensure that the disaster affected community becomes resilient and return back to normalcy. Generally, this phase takes a long time, as the efforts are made to restore all essential facilities to pre-disaster status. The major focus of this phase is on the measures that could pave 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.

As discussed earlier, the activities undertaken in all the three phases are not an isolated one and hence proper preparedness and mitigation measures are essential for an effective response and recovery of the society. Further insights on the different stages of a disaster have been made here to provide better understanding (IGNOU-NDMA, 2012):

Prevention	Prevention activities aim at totally avoiding the adverse impact of hazards and providing means to minimise 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 minimise 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 to actions against potential disasters. Mitigation measures are physical and both structural and 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. The following are the important components of disaster preparedness, that is, evacuation plans, incident response

	set-up, logistics management, standardisation of relief procedures, land-use planning, disaster insurance, awareness on vulnerability of women, elderly, children and disadvantaged sections of society, pertinence of disaster task force, role of traditional wisdom and community based disaster management.
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. The following are important components of disaster response, that is, role of search and rescue, health assessment, epidemiological survey, standard operation procedures, emergency operations centre, emergency health care, geographical information system and remote sensing, community radio and internet, communication and alarm systems and evacuation plans (See Unit 7 for more information).
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 (See Unit 9 for more information).
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 (See Unit 9 for more information).
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, it also focuses on 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 minimised. All development programmes in the area need to be mainstreamed with recovery programmes in order to treat disasters as development opportunities (See Unit 9 for more information).

Source: Adapted from IGNOU-NDMA, 2012.

6.4 DISASTER PREVENTION

As we know, disasters are inevitable and unavoidable. But appropriate preventive measures will help in reducing the impact of a disaster. The High Powered Committee (HPC) Report on Disaster Management (2001) considers “development of a culture of prevention as an essential component of an integrated approach to disaster reduction”. The Committee also pointed out that the ‘culture of prevention’ should be developed among the people, government and other community based organisations. In recent times, the system of disaster management has undergone a major change and importance has been given to disaster prevention too. The National Policy on Disaster Management (2009) considers it essential to put in place “appropriate institutional framework, management systems, and allocation of resources for efficient prevention and handling of disasters”. Developing early warning systems and developmental planning are the key measures towards disaster prevention. For achieving long-term development or sustainable development, the country should include the disaster preventive components in the policies, plans and the projects. Ideally, these preventive measures will be helpful during the stages of preparedness, response, recovery and rehabilitation. Following are some of the measures towards disaster prevention:

6.4.1 Measures towards Disaster Prevention

HPC has listed the following measures towards disaster prevention.

- Risk assessment is a required step for the adoption of adequate and successful disaster reduction policies.
- Disaster prevention should focus on reducing the need for disaster relief.
- Disaster prevention should be an integral part of the developmental policy and planning at national, regional, bilateral, multilateral and international stage.
- Early warning of impending disasters and their effective dissemination using telecommunication are the key factors to successful prevention.
- Preventive measures should involve participation at all levels, from the local community to national level to the regional and international level, to ensure effectiveness.
- Application of proper design and patterns of development focused on target groups through appropriate education and training is essential for the reduction of vulnerability.
- There should be acceptance on the part of the international community to share necessary technology to prevent disasters, which should be made freely available and done in a timely manner as an integral part of technical cooperation.
- Each country bears the primary responsibility of protecting its people, infrastructure and other national assets from the impact of natural disasters. The international community should demonstrate strong political determination required to mobilise adequate resources and make efficient use of existing resources, including financial, scientific and technological means (HPC, 2001).

Thus, the focus of preventive measures is to give thrust to vulnerability reduction and risk reduction. Proper preventive measures can reduce the need of the disaster relief and response. Though disasters cannot be completely prevented, paying

heed to early warning systems and communication strategies can help in reducing the impact of the disasters. The preventive measures cannot be implemented without the coordination of the community and the government. The following Table (adapted from Coppola, 2015) shows the difference between response and recovery based efforts and prevention and risk reduction based efforts.

Response and Recovery-based Efforts	Prevention and Risk-reduction based Efforts
Primary focus on disaster events	Focus on vulnerability and risk areas
Single, event based scenarios	Dynamic, multiple risk issues and development scenarios
Basic responsibility to respond to an event	Fundamental need to assess, monitor and update exposure to changing conditions
Often fixed, location-specific conditions	Extended, changing, shared or regional, local variations
Responsibility in single authority or agency	Involves multiple authorities, interests, actors
Command and control, directed operations	Situation-specific functions, free and open association and participation
Established hierarchical relationships	Shifting, fluid, and tangential relationships
Often focused on hardware and equipment	Dependent on related practices, abilities, and knowledge base
Dependent on specialised expertise	Focused on aligning specialised expertise and public views and priorities
Urgent, immediate, and short time frames in outlook, planning, attention and returns	Moderate and long time-frames in outlook, planning, values and returns
Rapidly changing, dynamic information usage, which is often conflicting or sensitive in nature	Accumulated, historical, layered, updated or comparative use of information
Primary, authorised, or singular information sources, need for definitive facts	Open or public information, multiple, diverse, or changing sources, differing perspectives and points of view
In-out or vertical flows of information	Dispersed, lateral flows of information
Related to matters of public security, safety	Matters of public interest, investment and money

Source: Terry, 2001.

Check Your Progress 1

Note: i) Use the space given below for your answers.

ii) Check your answers with those given at the end of the Unit.

1) Discuss Disaster Management Cycle and its stages.

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2) Explain Disaster Prevention.

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3) Bring out the difference between response and recovery based efforts, as well as prevention and risk reduction based efforts.

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6.5 DISASTER PREPAREDNESS

Disaster preparedness is defined as “actions taken in advance of a disaster to ensure adequate response to its impacts, and the relief and recovery from its consequences – is performed to eliminate the need for any last-minute actions” (Coppola, 2015). United Nations’ International Strategy for Disaster Reduction (UNISDR) has referred to preparedness as “the knowledge and capacities developed by governments, professional response and recovery organisations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions”. Disaster preparedness, as per IFRC (2005), is a “continuous and integrated process involving a wide range of activities and resources from multi-sectoral sources”. The United Nations Disaster Relief Office (UNDRO, 1982) defines disaster preparedness as “measures designed to organise and facilitate timely and effective rescue, relief, rehabilitation operations in case of disaster. Measures of preparedness include among others, setting up of disaster relief machinery, formulation of emergency relief plans, training of specific groups (and vulnerable communities) to undertake rescue and relief, stock piling supplies and earmarking funds for relief operations”. Thus, preparedness includes formulation of emergency plans, development of warning system, and training of personnel to handle the emergency. It also includes planning of evacuation measures and preparation for rescue measures. Preparedness helps in minimising loss of life, disruption of critical services and damages on the occurrence of a disaster (Kanal, 2013).

Disaster preparedness is not an easy task and is a complex process. No one knows about the aftermath of the disasters. It needs prior planning, proper institutional settings and coordination among various stakeholders. In this process of preparedness, the role of community is very important. Preparedness has to be the core requirement for communities, if they have to survive the aftermath of different catastrophes. There is an urgent need to build the capacity and capability of the local communities by empowering them with coping capacities and increasing their self-confidence

through recognition and increasing their knowledge, practices and values so that this falls in line with the developmental activities. The role of community participation in disaster preparedness is discussed at length in Unit 13.

6.5.1 Key Components of Disaster Preparedness Framework

Disaster preparedness framework has to encompass various measures. Following are some of the key components of disaster preparedness:

- Strengthening of policy, technical and institutional capacities in regional, national and local disaster management, including those related to technology, training, as well as human and material resources.
- Promoting and supporting dialogue, exchange of information and coordination, with the aim of fostering a holistic approach towards disaster risk reduction.
- Strengthening and developing coordinated regional approaches, to prepare or review and periodically update disaster preparedness plans and policies at all levels, with a particular focus on the most vulnerable areas and groups.
- Promoting the establishment of emergency funds, wherever needed, to support preparedness measures.
- Developing specific mechanisms to engage the active participation and ownership of relevant stakeholders including the communities, with the spirit of volunteerism.

6.5.2 Types of Preparedness

The preparedness activities can be divided into three types, namely 1) Target-oriented Preparedness; 2) Task-oriented Preparedness; and 3) Disaster-oriented Preparedness, which are discussed as follows:

6.5.2.1 Target-oriented Preparedness

Preparedness plans are target specific and for instance, the focus is laid on making different types of planning for the vulnerable groups viz., women, children, elderly and disabled. It also focuses on animals. Livestock would need a specific preparedness plan. Apart from that there could be health preparedness plans, risk reduction preparedness plans and awareness generation plans, some of which have been discussed in the succeeding text.

- ***Livestock Preparedness Plan*** – this may include preparatory work on database that provides information with regard to hazards, community profile, livestock profile and animals at risk; Assessment of resources including veterinary personnel, drugs and equipment, mobile veterinary units, veterinary hospitals; and General awareness amongst the community, and volunteers about the livestock management aspects including their recovery, rehabilitation, and control of diseases.
- ***Composite, Long-term Disaster Health Preparedness Plan*** – a composite plan for mitigation of medical and health related problems arising out of any natural disaster should include community profile, Plan of Action, Resource Planning, Training Plan, Allied Planning, Periodical Practice, Evaluation of Plan and its consequent modification; collaboration and coordination with allied agencies and neighbourhood areas.

- **Community Based Disaster Management (CBDM) Plan** – The preparatory work for CBDM plans to safeguard lives, livelihood and property and in this context, involvement of community or people is integral to disaster preparedness. It contains Risk Assessment Vulnerability Analysis; Resource Analysis and Mobilisation; Warning System and its dissemination; Community Response Mechanisms; Construction and Maintenance of Shelters; Mock Drills; Strengthening of Community Self-help capacities; Formation of Disaster Management committees and teams; Making of Seasonal Calendars; and Creating Hazard, Vulnerability, Risk and Capacity Analysis, etc.
- **Coordination Plan** – It is pertinent that coordination between all the institutions/agencies (Governmental and Non-Governmental) takes place systematically. Even though, coordination has to be established between the central, state and local levels, the majority of disaster information for the purpose of coordination is processed at the state level, depending on the intensity and scale of disaster event.

6.5.2.2 Task-oriented Preparedness

Task-oriented preparedness planning, focuses on carving out various tasks, which include the following:

- Mapping
- Planning
- Forming Disaster Task Forces
- Training of members of Task Force and other Volunteers
- Creating Structures for Coordination
- Promoting Awareness Campaigns
- Operationalising Disaster Management
- Recruiting Personnel for Relief and Distribution Tasks

6.5.2.3 Disaster-oriented Preparedness

Sometimes the disaster preparedness is oriented towards the particular type of disaster, for which the planning can be both structural and non-structural:

- **Structural Preparedness Measures** are proactive and reactive measures. These are used to arrest the adverse impact of disasters. These measures would vary from disaster to disaster.
- **Non-structural Preparedness Measures** include: Administrative and Regulatory Legislation; Insurance Schemes; Information, Education and Training; Community Participation, Community Action Groups; Responding to Warning Systems; Institution Building; Provision of Incentives; and Creations of Public Awareness (IGNOU-NDMA, 2012).

6.6 DISASTER MITIGATION

Disaster mitigation involves measures to reduce the effects of disaster causing phenomena. It includes all actions to reduce the impact of a disaster that can be taken prior to its occurrence including preparedness and long-term risk reduction measures. According to Coppola (2015), “The components of disaster management cycle, that is, preparedness, response and recovery are performed either in reaction

to hazards or in anticipation of their consequences and mitigation measures seek to reduce the likelihood or consequences of hazard risk before a disaster ever occurs”. The DM Act, 2005, defines Mitigation as “measures aimed at reducing the risk, impact, or effects of a disaster or threatening disaster situation”. Like preparedness and preventive measures, mitigation measures are also essential to deal with disaster. Thus, a sustainable development model towards disaster management has to focus on mitigation too.

6.6.1 Disaster Mitigation Approaches

The disaster mitigation can be divided into two approaches viz., Structural Approach and Non-structural Approach .

6.6.1.1 Structural Approach

Structural approach is divided into engineered structures and non-engineered structures. Engineered structure is about the structure that is constructed by architects and engineers. This approach involves various activities like planning and designing of bridges, dams, buildings, roads, etc. The building codes are available to construct various structures in disaster prone areas. Though engineered structures are expensive it helps in disaster resistance. On the other hand, non-engineered structure is something which is constructed by local people with the available local knowledge and skills. Mostly it is constructed by locally available masons, carpenters, etc. The materials which are used for this are mostly from locally available raw material. The cost of the construction is less expensive; however, it is not disaster resistant. The structural approach is also called as a “man-controlling nature”.

6.6.1.2 Non-structural Approach

Non-structural approach of the disaster mitigation is human behaviour oriented, which does not focus on the engineered structures. It is called as a “man adapts nature”. The following are the key components of Non-structural approach of mitigation, that is, Legislation, Insurance, Information, education and training, Community participation, Community action groups, Responding to warning systems, Institution building, Incentives and Public awareness.

Check Your Progress 2

Note: i) Use the space given below for your answers.

ii) Check your answers with those given at the end of the Unit.

1) Explain Disaster Preparedness and its key components.

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2) Discuss the various types of Disaster Preparedness.

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3) Examine Disaster Mitigation Approaches.
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6.7 CONCLUSION

Day by day, disasters are leading to huge economic losses and developmental setbacks to the country. Incorporating proper preventive, preparedness and mitigation strategies in the development planning will reduce the impact of the disaster, discussed in this Unit. Towards effective disaster management, it is pertinent that various measures as pointed in disaster management cycle in all three phases of disaster are incorporated at the international and national level to ensure effective disaster management.

6.8 GLOSSARY

- Disaster Management Act, 2005** : The Disaster Management Act, 2005 was enacted from 23rd December 2005. This Act provides for the effective management of disasters and for matters connected there with or incidental thereto.
- National Policy on Disaster Management, 2009** : National Policy on Disaster Management (NPDM) was approved by the then Union Cabinet on 22nd October, 2009 with the vision “To built a safe and disaster resilient India by developing a holistic, proactive, multi-disaster oriented and technology driven strategy through a culture of prevention, mitigation, preparedness and response.

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6.10 ANSWERS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) Your answer should include the following points:
 - Disaster Management Cycle integrates various isolated activities, attempts and different actors.
 - Pre-disaster, During-disaster and Post-disaster.
- 2) Your answer should include the following points:
 - Prevention activities aim at totally avoiding the adverse impact of hazards and providing means to minimise environmental, technological and biological disasters.
 - Measures towards Disaster Prevention.
- 3) Your answer should include the following points:
 - Response and Recovery-based Efforts.
 - Prevention and Risk-reduction based Efforts.

Check Your Progress 2

- 1) Your answer should include the following points:
 - Preparedness includes formulation of emergency plans, development of warning system, and training of personnel to handle the emergency.
 - Key Components.
- 2) Your answer should include the following points:
 - Target-oriented Preparedness.
 - Task-oriented Preparedness.
- 3) Your answer should include the following points:
 - Structural Approach.
 - Non-structural Approach.

