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## Essentials of Inclusion of Natural Disaster Management in Teacher Education Curriculum

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### **Abstract:**

*Natural Disaster Management essentially deals with management of resources and information relating to a disaster event and is measured by how efficiently, effectively and seamlessly one coordinates these resources. At the individual and organizational level deals with issues of planning, coordination, communication and risk assessment. It deals with all humanitarian aspects of emergencies, in particular preparedness, planning, response and recovery in order to lessen the impact of disaster. "Natural 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. The teacher "Architecture of Nation" is a dynamic force of the society. A society without a teacher is like a body without a soul, a skeleton without flesh and blood, a shadow without substance. As a social engineer, he socializes and humanize the younger generation by the man-like qualities. Inclusion of natural disaster management in teacher education curriculum enhances the teacher trainee to equip and prepare themselves for natural disaster management. This helps in transforming the knowledge of natural disaster management to the future younger generation and to save the lives of living beings in the world.*

**Keywords:** Disaster, natural disaster management

### **1. Introduction**

A Disaster is a serious disruption of functioning of a society, causing widespread human, material or environmental losses which exceed the ability of the affected society to cope with using only its own resources. Ronan and Johnston (2005) defined disasters are unpredictable, and damaging, and it can be easy to feel that they are entirely beyond our control. According to Nashreen Mahbuba (2004) a disaster can be regarded as a severe, relatively sudden, and unexpected disruption of normal structural arrangements within a social system over which the system has no firm control. The Natural Disaster Management Act, 2005 defines disaster is a catastrophe, mishap, calamity or grave occurrence affecting any area, arising from natural or man-made cause, or by accident or negligence, which results in substantial loss of life or human suffering, and destruction of human property, or degradation of environment. Disaster as a crisis situation that outstrips the capacity of a society to cope with (Anderson Mary and Peter Woodrow, 1989). Disaster management is 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. Natural Disaster Management essentially deals with management of resources and information relating to a disaster event and is measured by how efficiently, effectively and seamlessly one coordinates these resources. At the individual and organizational level deals with issues of planning, coordination, communication and risk assessment. It deals with all humanitarian aspect of emergencies, in particular preparedness, planning, response and recovery in order to lessen the impact of disasters.

Prevention is better than cure, is an old saying which is very apt in the context of disaster management. Government of India, Ministry of Human Resource Development in its Tenth Five Year Plan (2002-2007) emphasized the need for integrating disaster management in the existing education system in India. One of the important initiatives includes disaster management in the curriculum of school and professional education has been recommended. In the recommendation empowering the younger generation on the preventive aspects, the types of services to be rendered in a disaster situation and the need for human approach from part of the curriculum.

#### *1.1. Causal Factors of Disaster*

Common causal factors play a vital role in determining the magnitude and severity of a disaster. Poverty, ungoverned population growth, rapid urbanization and migration, transition in cultural practices, environmental degradation, lack of awareness and information.

### 1.2. Dimensions and Typology of Disasters

- Meteorological/Climatic origin: Drought, Hailstorm, Heat wave, Hurricane Tropical Cyclones and Typhoons, Ice age, Ice Storm and Tornado.
- Hydrological origin: Flood, Limnic eruption, Maelstrom, Seiche and Tsunami
- Geological origin: Earthquake, Lahar, Landslide and Mudflows, Sinkholes, Volcanic Eruption and Avalanche.

## 2. Components of a Natural Disaster

In order to improve disaster management one must first understand the components of a natural disaster and how they interact with knowledge systems. Disasters arise out of the interaction between a natural hazard and human vulnerability.

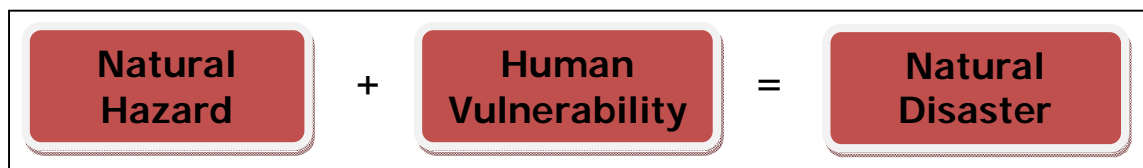


Figure 1

## 3. History of Natural Disasters in India

The unique geo-climate conditions of the Indian sub-continent make this region among the most vulnerable to natural disasters in the world. Natural disasters occur frequently and while the community at large has adapted itself to these regular occurrences, the economic and social costs continue to mount year after year. The Indian sub-continent is highly vulnerable to drought, flood, cyclones and earthquakes. Landslides, avalanche and bush fire frequently occur in the Himalayan region of northern India. Of the 29 States and 7 Union Territories in the country, 22 are disaster prone.

## 4. Major Natural Disasters in India

India has the selfless boundary of nature, which is the great gift to our mankind. For the past centuries though, Mother Nature has been combining its gifts with its often-inexplicable moods of destruction and fury. The destruction creates huge loss to the human property, plants and animals. Earthquake, tsunami, flood, cyclone, landslide and drought are the major natural disasters faced by India.

### 4.1. Earthquake

Earth quake is the sudden shaking of the earth crust. They may occur any time of the year, day or night with sudden impact and little warning making it impossible to predict. The earth's crust is a rocky layer of varying thickness ranging from a depth of 10 Km under the sea to 65 Km under the continent. It consists of varying sizes of tectonic plates. The theory of "Elasticity" says that the earth's crust is continuously stressed by the movement of tectonic plates. It eventually results a point of maximum supportable strain. A rupture then occurs along the fault and the rock rebounds under its own elastic stresses until the strain is released. The fault rupture generates vibration called seismic waves or earthquake that radiates in all direction.

The magnitude of earth quake is determined by Seismograph and the intensity of earth quake is measured by Modified Mercalli Scale.

### 4.2. Tsunami

The term Tsunami has been derived from a Japanese term Tsu meaning 'harbor' and nami meaning 'waves'. Tsunami popularly called tidal waves but they actually have nothing to do with the tides. These waves which often affect the distant shores, originate by rapid displacement of water from the lake or the sea either by seismic activity, landslides, volcanic eruptions or large meteoroid impacts. Whatever the cause may be the sea water is displaced with a violent motion and swells up, ultimately surging over land with great destructive power. The effects of a tsunami can be unnoticeable or even destructive. Tsunami in the deep water of the ocean may travel in the speed of a jet aeroplane 800 km/hr with highest force increase in the sea water.

Tsunami can be predicted by Pacific Tsunami warning system (PTWS) near Honolulu, Hawaii developed by the International Tsunami Warning System. This system alerts the countries several hours before the tsunami strikes. The Regional Warning System is capable to provide warning in less than 15minutes the tsunami strikes. Tsunami can also be detected with the help of radars.

### 4.3. Flood

Flood is a state of high water level along a river channel or on the coast that leads to inundation of land, which is not usually submerged. Flood may happen gradually and also may take hours or even happen suddenly without any warning due to breach in the embankment, spill over, heavy rain. Flood forecasting and warning has been highly developed with the advancement of technology such as satellite and remote-sensing equipments.

#### 4.4. Cyclone

Cyclone is a region of low atmospheric pressure surrounded by high atmospheric pressure resulting in swirling atmospheric disturbance accompanied by powerful wind blowing in anti-clock wise direction in the northern hemisphere and in the clock- wise direction in the southern hemisphere. Strong wind, exceptional rain and storm urge are the general characteristics of a cyclone. Our country has one of the best cyclone warning system in the world. The Indian Metrological Department (IMD) is the nodal department for wind detection, tracking and forecasting cyclones. Cyclone tracking is done through INSAT satellite.

#### 4.5. Landslide

The term 'landslide' includes all the varieties of mass movement of hill slopes. It can be defined as the downward and outward movement of slope forming materials composed of rocks, soil, artificial fills. It is the combination of all these materials along with the surface of separation by falling, sliding and flowing. It may happen either slowly or quickly from one place to another. Landslide is primarily associated with mountainous terrains. It can also occur in the areas where the activities such as surface excavations for highways, buildings and open pit mines take place. They often takes place in conjunction with earthquakes, flood and volcanoes. At times, prolonged rainfall causing landslide may block the flow of river for quite some time. The formation of river blocks can cause havoc to the settlements downstream on its bursting.

#### 4.6. Drought

Drought is either absence or deficiency of rainfall from its normal pattern in a region for an extended period of time leading to general suffering in the society. It is interplay between demand that people place on natural supply of water and natural event that provides the water in a given geographical region. The Indian Meteorological Division (IMD) has fixed the criteria for identifying the drought. One set drought is the deficiency of a particular year's rain fall exceeding 25% of the normal. Moderate drought is the deficiency of rain fall between 26% to 50% of the normal. Severe drought is the deficiency of rain fall more than the 50% of the normal.

#### 4.7. Hurricane

A hurricane is a low-pressure cyclonic storm system which forms over the ocean. A hurricane is caused by evaporating water, which comes off from the ocean and becomes a storm. The carioles effect causes the storm to spin, and a hurricane is declared when this spinning mass of storms attains a wind speed greater than 74 mph.

#### 4.8. Storm surge

A storm surge is an onshore rush of water associated with a low pressure weather system, typically a tropical cyclone. Storm surge is caused primarily by high wind pushing on the ocean's surface. The wind causes the water to pile up higher than the ordinary sea level. Storm surges are particularly damaging when they occur at the time of a high tide, combining the effects of the surge and the tide.

### 5. 2P3R Phases of Natural Disaster Management Cycle

#### 5.1. Prevention

The activities designed to provide permanent protection from natural disaster comes under this phase. It offers guiding principles, priorities for action, and practical means for achieving natural disaster resilience for vulnerable communities. In this phase the risk of loss of life and injury can be mitigated with good evacuation plans, environmental planning and designs for action, and practical means for achieving disaster resilience for vulnerable communities.

#### 5.2. Preparedness

Preparedness is the main phase of natural disaster management. The activities designed to minimise the loss of life and damage comes under this phase. It paves the way for reducing the impact of natural disaster by removing people and property from a threatened location and by facilitating timely and effective rescue, relief and rehabilitation.

#### 5.3. Response

The response phase of an emergency may commence with search and rescue but in all cases the focus will quickly turn to fulfilling the basic humanitarian needs of the affected population. It provides guidance on emergency support functions which may be integrated in whole or parts to aid in his phase.

#### 5.4. Relief

Relief phase is the multi-agency coordinated phase. The activities like 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 were included in this phase.

#### 5.5. Recovery

This is the phase when emergency needs have been met and the initial crisis is over, the people affected and the communities that support them are still vulnerable. Recovery phase includes activities such as rebuilding infrastructure, health care and rehabilitation.

This phase should be blend with development activities like building human resources for and developing policies and practices to avoid similar situations in future.

Disaster Risk Management includes sum total of all activities, programmes and measures which can be taken up before, during and after a disaster with the purpose to avoid a disaster, reduce its impact or recover from its losses. The three key stages of activities that are taken up within disaster risk management.



Figure 2

#### 5.6. Objectives

The main objectives of inclusion of Natural Disaster Management in Teacher Education Curriculum:

- To reduce loss of lives and property damage
- To prevent economic disruption
- To create awareness about safety from disasters
- To link development programmes with disaster planning
- To develop the protection of habitation from adverse hazard impacts
- To create awareness on hazards occurrence, damage caused to infrastructure and economic loss
- To develop an attitude to coordinate between state and Non-government Organization
- To provide disaster professionals and volunteers with a course of training
- To offer higher quality services
- To know the main areas of risk and to take steps to minimize the risk or detect any problems as early as possible
- To ensure a positive role in preventing disasters
- To ensure good lines of communication with staff working in those areas
- To ensure good lines of communication with other key staff likely to be involved in disaster prevention, response and recovery.

#### 6. Natural Disaster Management in B.Ed. Colleges

Institution safety and educational continuity require a dynamic, continuous process initiated by management and involving workers, students, parents, and the local community. B.Ed. colleges disaster management involves the familiar cycle of steps found in all project management: assess hazards, vulnerabilities, capacities and resources; plan and implement for physical risk reduction, maintenance of safe facilities, standard operating procedures and training for disaster response; test mitigation and preparedness plans and skills regularly, with realistic simulation drills; and revise plan based on experience.

B.Ed. colleges' disaster management mirrors individual and family disaster prevention, and wider community disaster prevention efforts. This guidance document is organized to help remember and observe the parallel processes for disaster prevention that are taken up at every level of the society. The full scopes of activities are as follows:

- Assessment and planning – establishing or empowering school disaster management committee; assessing risks, hazards, vulnerabilities and capacities; making contingency plans for educational continuity; communicating plan.
- Physical and environmental protection – structural safety maintenance, non-structural mitigation; local infrastructure and environmental mitigation; fire safety.

- Response capacity development – standard operating procedures; response skills and organization; response provisions.
- Practicing, monitoring, and improving – holding simulation drills to practice, reflect upon and update plan; monitoring indicators for school disaster management.

When the B.Ed students were trained well, they can help in rehabilitation and resettlement of victims at times of floods, earthquakes and drought. They can play a very important role in disaster management. They can spread the components of disaster to all about the precautions to be taken at times of disaster. They will help the victims with basic needs and they will do whatever they can at times of disaster.

It is the duty of the staff members and the institution to let them understand their duties and responsibilities before, during and after the disaster. This will minimize the panicking and uncontrolled disaster to the most extent. We should have to train them with the knowledge of basic first aid to save lives of millions.

#### *6.1. Essentials of Inclusion of Natural Disaster Management in Teacher Education Curriculum*

The teacher “Architecture of Nation” is a dynamic force of the society. A society without a teacher is like a body without a soul, a skeleton without flush and blood, a shadow without substance. As a social engineer, he socializes and humanizes the younger generation by the man- like qualities. Among all the professions teaching is the noblest one. In the present scenario the teacher occupies a pivotal position than others in the world. He has to play incredible role in the recent trends. He is the right human resource to deal rightly with the younger minds for the better world. Now we are in the highly developed technological world, we can bring the world using a finger within a fraction of second. Even then, need improvement in imparting knowledge about natural disasters, awareness about safety from disasters, preparedness and planning for natural disasters, responding and recovery natural disaster. With this connection it is the right time in the right way to include natural disaster management in teacher education curriculum. Inclusion of natural disaster management in teacher education curriculum enhances the teacher trainee to equip and prepare themselves for natural disaster management. This helps in transforming the knowledge of natural disaster management to the future younger generation and to save the lives of living beings in the world.

#### **7. Conclusion**

In the recent past years natural disasters like Earthquake, Tsunami, Cyclone, floods destroyed the human lives, animals, resources which exceed the ability of the affected society to cope with using only its own resources. Education is the only tool to remove any kind of barriers and struggles from the society. If natural disaster management is implemented effectively in teacher education curriculum we can educate, train and prepare the teacher for natural disaster prior to the occurrence or during disaster or after the occurrence of disaster and we can prepare the younger generation to prepare, to plan, to respond and to recover from natural disaster. Implementing natural disaster management in teacher education program is the right way to overcome any kind of disaster which occurs in the globe. So it is the right time to suggest strongly implementing natural disaster management in teacher education curriculum.

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