

Netaji Subhas Open University
Post Graduate Diploma in Disaster Risk Management (PGD DRM)

Syllabus

Course Structure:

Paper 1:

Module A: Basic Concepts of Disaster Management

Module B: Disaster Risk Management

Paper 2:

Module A: Emergency Response and Crisis Management

Module B: Disaster Risk Mitigation

Paper 3:

Module A: Government interventions and Institutional Mechanism for Disaster Management

Module B: Practical

(Each module will have 50 marks)

Paper-4: Natural Hazards Risk Management

Paper-5: Climate Variability & Disaster Risk and Urban-Rural Risk Management

Paper-6: Industrial Hazard Risk Management

Full marks: 600

Detailed Syllabus

Paper 1:

Module –A: Basic Concepts of Disaster Management:

Objective: To familiarize the Students with the concepts, terminologies and developments in the field of Disaster Management and to inform them about the prospects of a Disaster Manager.

- i) **Introduction** – the necessity of studying Disaster Management (DM); the scope for a Disaster Manager
- ii) **Disaster** – Definition; Types of disasters; History of disasters; Components of disaster; Dimension of disasters; Phases of disaster.
- iii) **Hazard** – Definition; types of hazards; characteristic features, occurrence and impact of different types of hazards viz. natural hazards (including geo hazards), human induced hazards, environmental hazards, bio hazards; Hazard map of India.
- iv) **Vulnerability** – Definition; Types of vulnerability – physical vulnerability, socio-economic vulnerability, vulnerability related to gender and age, rural & urban vulnerability; Vulnerability analysis with special reference to India.
- v) **Disaster Risk** – Definition; Significance; Factors of disaster risk; Disaster Risk analysis (with special reference to the Indian context) – Inter-relationship between Hazard, Vulnerability and Disaster Risk; Global disaster risk situation; Disaster risk situation of India; Hazard-Vulnerability maps of India; Case studies.
- vi) **Disaster Management** – Definition; Components of DM; Crisis Management; Risk Management; Disaster Management Cycle; Impact of disaster on development; UNISDR mandate in Disaster Relief & Management; IDNDR; Yokohama Strategy and Hyogo Framework – a ‘Paradigm shift’ in disaster management policy (policy for reduction of disaster consequences); India’s response to changes in DM Policy

Module – B: Disaster Risk Management:

Objective: To help the Students to learn how to assess disaster risk and prepare DRM Plans and how to implement them.

- i) **Assessing Disaster Risk** - Disaster Risk and Damage potential of disasters; Case studies on some major disasters and Lessons learnt there from (identification of the gaps causing the disasters); Assessment of Disaster Risk.
- ii) **Ways of minimising disaster risk** – Preparedness, Mitigation and Prevention – definition, specific interventions required for each, procedure to be followed and role of various stakeholders in each.
 - a) **Preparedness** – Awareness generation; Information management; Early warning dissemination system; Community participation – Task force formation; Training and Capacity building; Preparedness plan preparation; Simulation.
 - b) **Mitigation** – Knowledge of disaster specific risk; Analysing the mechanism of disaster damages and possible interventions for minimising the impact of disaster; Preparation of Mitigation plan.
 - c) **Prevention** – Analysing the nature of a hazard and ways of minimising its intensity; Preparation of disaster prevention plan.
- iii) **Disaster Risk Management (DRM) plan** – Preparing Hazard-Vulnerability profile; Stakeholder analysis; Disaster risk assessment; Incorporation of Preparedness, Mitigation and Prevention plans.
- iv) **Implementing DRM plan** – Sharing DRM plan with all stakeholders; Division of Roles and responsibilities as per DRM plan; Resource mobilisation; Monitoring and Evaluation.
- v) **Role of Risk transfer and insurance** in DRM

Paper 2:

Module – A : Emergency Response and Crisis Management

Objective: To help the Students to learn how to prepare Crisis Management plans how to respond to a disaster so as to restore normalcy at the earliest and how to document the whole process for guidance in future.

- i) **Crisis Management** – Rescue, relief, rehabilitation and reconstruction; Crisis Management plan; Case studies.
- ii) **Emergency response** – Standard Operation Procedure (SOP) for disaster response; Information Management System; Warning Dissemination; Evacuation; Search and Rescue operations; Relief operations; Emergency Operation Center (EOC); Resource Management & Networking – India Disaster Resource Network; Role of Disaster Response Forces and Community Based Organisations (CBO) in emergency response mechanism.
- iii) **Relief Operations** – Arranging for Temporary shelter, Food, Safe drinking water, Sanitation and Medical aids; Role of NGOs and Health workers in relief operations; Maintaining law and order.
- iv) **Recovery-** 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, while encouraging and facilitating necessary adjustments to reduce disaster risk.
 - a) **Rehabilitation** – Damage Assessment; Need analysis of disaster affected people; Resource mobilisation for rehabilitation; Restoration of basic amenities – housing,

drinking water, sanitation, medical facilities, power supply etc.; Creating Livelihood options.

- b) **Reconstruction** – Repair and reconstruction of roads, bridges, crossways, buildings, structures and establishments damaged or destroyed in the disaster; Restoration of operations of the service sector.
- c) **Documentation** – Documenting disaster; Lessons learnt; Updating DRM Plan for risk mitigation.

Module – B : Disaster Risk Mitigation:

Objective: To help the Students learn about the nature and characteristics of major natural disasters and how to mitigate the risk involved with such disasters.

- i) **Earthquake Risk Mitigation** – Earthquake, its Causes and Characteristic features; Magnitude and Intensity of earthquake; Major earthquakes; Seismic zoning; Earthquake vulnerability of India; Earthquake risk mitigation – Seismic performance examination of RCC Buildings, Retrofitting of vulnerable buildings, Construction of earthquake resistant buildings following proper BIS codes, Earthquake preparedness; Case study – ‘Bhuj Earthquake’.
- ii) **Flood Risk Mitigation** – Causes of Flood; Major floods; Flood vulnerability of India; Flood preparedness and mitigation; IT-tools and techniques of Flood Control; Preventive measures against floods (dams, barrages and embankments); Emergency response during floods; Case study – ‘The Deluge 2000’ (most devastating Flood in South Bengal till date).
- iii) **Cyclone Risk Mitigation** – Causes of Cyclone; its characteristics; Cyclone vulnerability of India; Cyclone preparedness; Forecast and early warning dissemination; Case study – ‘Orissa Super cyclone’.
- iv) **Coastal degradation** – Coastal erosion and Marine degradation; Wave Erosion; Tidal storm; Tsunami; Coastal Risk Mitigation; Measures for sea beach protection; Protection of Marine environment.
- v) **Drought Risk Mitigation** – Causes and characteristics of Drought; drought vulnerability of India; Drought preparedness and Mitigation.
- vi) **Landslide Risk Mitigation** – Causes and Characteristics of Landslides; Landslide vulnerability of India; Mitigation measures; Prevention measures.

Paper 3:

Module – A : Government interventions and Institutional mechanism for Disaster Management:

Objective: To help the Student learn what interventions the Government is doing in the field of Disaster Management.

- i) **Disaster Management Policy Environment and local Action** – Disaster Management Act 2005; Disaster Management Authority at National, State and District levels; Roles and responsibilities of Govt. Authorities including Local Self Govt. at various levels.
- ii) **Funding for Disaster Management** – State Disaster Mitigation fund, State Disaster response fund (SDRF), National Disaster Response Fund (NDRF), Prime Minister National Relief Fund (PMNRF), Chief Minister Relief Fund and Role.
- iii) **Capacity Building** – Setting up EOCs at state, district and block levels; Raising National/State Disaster Response Force; Training and Capacity building of all stakeholders – National Institute of Disaster Management (NIDM); Disaster Management Centres (DMC) in every State; Centres of Excellence.

Module – B : Practical (Hands on Experience):

Objective: To judge the mastery of the Students in preparing DM Plan and to help them acquire the skills for search, rescue and evacuation operations.

- i) Hands on (Hand holding) for preparation of disaster management plan; search, rescue & evacuation; Audio-visual exercise;
- ii) Project work.

Paper 4: Natural Hazards Risk management

Earthquake Risk Management:

Earthquake Risk & Impact – Examples -Japan & Sikkim; Gap between perception of people & administration; Motivating preparedness Actions; Post Disaster Recovery Experience Gujarat; Mode Drill for public

Flood Risk Management:

Rising Flood Damage; Climate variability & change; Unprecedented Demographic changes; Increasing Environmental courses; Assessing Flood Risks; Typology of Flood Risk; Flood impact Assessment; Flood Risk Analysis; Managing Flood Risk including Adoption; Integrated Flood Management

Cyclone Risk Management

Killer Cyclones / super cyclones (Typhoons ?); Framework for preparedness & mitigation: Acceptable Risk & Total Risk; Early warning & Communication; Community based disaster Preparedness; Risk transfer and Risk financing; Capacity Development training ; Awareness & Education; Contingency plans

Tsunami Risk Management

Magnitude & Intensity of a Tsunami; Types of Tsunami; Features of Tsunamis; Prediction of Tsunamis; Mitigation efforts Tsunamis including Hazard Maps (Warning Centre - Hyderabad); Example Chennai Coastline

Paper 5A: Climate Variabilities & Disaster Risk & Urban – rural Risk Management

Paper 5B: Interrelationship between disaster and development

Climate Disasters & Agriculture

Impact of climate Disasters; Potential impacts of climate change on Agriculture; Vulnerability of agriculture – strategies for reduction : Disaster prevention & preparedness Drought; Mitigation; for climate disasters; Mitigation & preparedness strategy for agriculture, Examples; Farmers' Adaptation to climate change on agriculture.

Risk Management of Forest Disasters

Elements detail; Productive functions of Forest resources (including socioeconomic functions); Forests, Deforestation & climate change; Desertification & Deforestation; Flooding & Deforestation; Lessons from Forest Management & Disaster Risk Reduction

Urban Disaster Risk Management

Definitions; Understanding Risk of Urban Elements; Urban Risk Reduction

Rural Livelihood & Management of Disaster Risk Reduction

Definition of Vulnerability; Case Studies

Drought Risk Management

Drought & Development; Drought Relief, Management Prevention; National Drought Policy : Indian Case Studies & Integrating Technology & people (emphasis on traditional wisdom); Industrial Disaster Risk Reduction & Emergency Management including Industrial Hazardous; Waste Management (usually in an industry it becomes an accident and emergency management); Records of disasters / accidents; Recent major accidents; Knowing the technological advances of safety features; National legal acts; Need for emergency response planning; Formation of planning committee; Survey of potential disasters known as Hazards Survey; Plan for Emergencies – formulation based on survey and past records; Training of personnel; Notification for public and Regulatory officials; Plan Implementation includes: (i) Inventory checks on a routine basis of equipment,

Personnel, hazards and population densities (ii) Auditing of the emergency procedure (iii) Training on routine basis (iv) Practice Drills

Economics plays an important role in setting many environmental control operations; Cost – benefit analysis that addresses the economic efficiency of the operation is needed. Cost is also an impact into an analysis of the economic impact of each regulatory alternative. If the said project is not profitable, it can't be pursued and an alternate identified where fewer resources will be wasted.

Preliminary cost analysis say with an approx accessory of +10% :

- a. Capital Equipment -15% cost
- b. Capital costs (equipment design + installation)
- c. operating costs
- d. project evaluation
- e. project optimization

Preventive & Safety measures in terms of future catastrophe :

Medical Waste Management

Radioactive Waste Management

Hazardous Waste Management

Issues (Hazardous Wastes effect Natural Environmental pathways)

e.g Water – Surface & Groundwater storage tanks – surface & groundwater

Major containments oil in water & metals (pb, cd, Hg, As) & chemicals/chemical products

- Groundwater impacts - x x x x
- Drinking water impacts x x x x
- Soil impacts x x x x
- Surface water impacts x x x
- Air impacts x x
- Flora impacts x
- Animal Life impacts x
- Human Health impacts x

Study Land use in contaminated site vicinity contamination is defined as a 'toxic soup' of Hazardous Wastes containing

- Heavy metals
- Solvents
- Organic chemicals
- Municipal Wastes
- Inorganic chemicals
- Pesticides / Herbicides
- Paints & oils
- Radioactive Wastes

Waste sources are mining, landfills (industrial, municipal), Recycling etc.; Manufacturing ; Chemical & allied products; Fabricated metal products; Electronic & Electric Equipment; Electroplating; Wood treatment; Petroleum & refining; Primary metal products (metals in soil and acid water); Rubber & Plastic products; Paper & allied products; Construction, Agriculture, Food products, other turf; Land use to be checked in a hazardous site; Residential; Industrial Area; Commercial Dist; Agricultural; Forest & Fields; Military facilities; Mining; Others Site setting:

Paper 6: Industrial hazard Risk Management

Industrial Hazardous Waste Management (Central Govt. Framed in 1989)

Hazardous Wastes (Management & Handling)

Rules in 1989 and amended it in 2000 & 2003

Study :

- Characteristics
- Recycling?
- Issues of concern
- Legislations & Regulations
- International Initiatives
- Management options :
 1. Hazardous Wastes as fuel
 2. International
 3. Hazardous Wastes secured & used as landfills (?)

Climate Disasters & Agriculture

- Trends
- What is Climate Risk
- Impact

- Framework of climate disasters in agriculture and of climate Risk Management Decisions (Example from Japan on climate change mitigation)
- Potential impacts of climate change on agriculture
- Strategies for Reduction
- Mitigation & preparedness (strategy) for agriculture
- Farmers adaptation to climate change in agriculture
- Agricultural Response & Livelihood Adaptations – Examples from Bangladesh, Sri Lanka, USA

Management of Drought And *Its Risk*

Drought & Development

- Drought : Relief Management & Prevention :
- Monitoring
- Issues in Drought Management
- National Drought Policy
- Indian case studies + Drought Mitigation & management in India(also Policy issues)
- Indigenous acknowledge & Experience for Drought mitigation in India

Rural Livelihood and Management of Disaster Risk Reduction

- General Concepts
- Community Centred approach in Disaster Management
- India's vulnerability
- Case study from Vietnam :

- Objectives & approach
- Activities to reduce risks of natural disasters
- Activities in different natural settings
- Analysis of relevant commune
- Direct & Indirect damage caused by flooding

Urban Disaster Risk Management

Defining Urban Risk Reduction

Risk & Reduction

Understanding Urban Risk :

- : Urbanization
- : Urban population
- : Urban structures

: Urban settings
: Urban reforms
: Urban primary
: Urban environment
: Urban settlements – formal and informal
: Urban economic imbalances
: Urban services
: Urban management

- Urban Risk Reduction –

With case of Surat (on Reducing Urban Risk)
Risk Management and Forest Disaster

- General concepts
 - Natural disaster and disaster risk
- Forest management & sustainable forest management :
 - Extent of Forest resources
 - Biol diversity
 - Forest health & vitality
 - Productive functions of forest resources
 - Productive functions of forest resources
 - Socioeconomic functions of forest resources inclusive of ecotourism
- Forest Deforestation & Climate Change :
 - Desertification & deforestation
 - Flooding & deforestation
- Forest Management & Disaster

Risk Reduction :

- Tsunami related events
- Storm related events
- Storm related events
- Landslide related events