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DISASTER MANAGEMENT

B.P.A.G.-171

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Based on

C.B.C.S. (Choice Based Credit System) Syllabus of

I.G.N.O.U.

& Various Central, State & Other Open Universities

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QUESTION PAPER

June – 2024

(Solved)

DISASTER MANAGEMENT

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Time: 3 Hours]

[Maximum Marks: 100

Note: Answer any **five** of the following questions each by selecting at least two questions from each Section. Each question carries equal marks.

SECTION-I

Q. 1. Describe the various types of natural disasters.

Ans. Ref.: See Chapter-3, Page No. 20, 'Types of Natural Disasters'.

Q. 2. Explain the vulnerability profile of India.

Ans. Ref.: See Chapter-4, Page No. 31, 'Vulnerability Profile of India'.

Q. 3. Discuss the role of Central and State Governments in disaster management.

Ans. Ref.: See Chapter-5, Page No. 43, 'Role of Central and State Governments'.

Q. 4. Write a note on the types of disaster preparedness along with its key components.

Ans. Ref.: See Chapter-6, Page No. 56, Q. No. 4, Page No. 57, Q. No. 5.

SECTION-II

Q. 5. Describe the funding arrangements for reconstruction activities.

Ans. Ref.: See Chapter-9, Page No. 84, 'Funding Arrangement for Reconstruction' and Q. No. 3.

Q. 6. Elaborate the key aspects of development of environmental infrastructure.

Ans. Ref.: See Chapter-11, Page No. 98, 'Development of Environment Infrastructure'.

Q. 7. Discuss the institutional framework of community based disaster management.

Ans. Ref.: See Chapter-13, Page No. 117, 'Community Based Disaster Management: Institutional Framework'.

Q. 8. Write a note on Odisha super-cyclone and the role of Odisha State Disaster Management Authority (OSDMA) in this regard.

Ans. Ref.: See Chapter-15, Page No. 136, Q. No. 1.



QUESTION PAPER

December – 2023

(Solved)

DISASTER MANAGEMENT

B.P.A.G.-171

Time: 3 Hours]

[Maximum Marks: 100

Note: Answer any **five** of the following questions each by selecting at least two questions from each Section. Each question carries equal marks.

SECTION-I

Q. 1. Discuss various factors of vulnerability.

Ans. Ref.: See Chapter-2, Page No. 12, 'Vulnerability Factors'.

Q. 2. Describe the institutional framework under the Disaster Management Act.

Ans. Ref.: See Chapter-5, Page No. 41, 'Institutional Framework Under the Disaster Management Act'.

Q. 3. Write a note on Climatological Disasters.

Ans. Ref.: See Chapter-3, Page No. 25, Q. No. 2.

Q. 4. Examine response mechanisms for disaster.

Ans. Ref.: See Chapter-7, Page No. 64, 'Response Mechanism'.

SECTION-II

Q. 5. Describe the framework for damage assessment.

Ans. Ref.: See Chapter-8, Page No. 72, 'Framework and Methods'.

Q. 6. Write a note on climate change vulnerability.

Ans. Ref.: See Chapter-10, Page No. 91, 'Climate Change Vulnerability'.

Q. 7. Examine the relationship between disasters and development.

Ans. Ref.: See Chapter-11, Page No. 97, 'Relationship between Disaster and Development'.

Q. 8. Discuss the significance of indigenous knowledge and coping strategies during cyclones, floods and droughts.

Ans. Ref.: See Chapter-12, Page No. 106, 'Introduction' and 'Understanding Traditional Knowledge', Page No. 108, 'Indigenous Knowledge and Coping Strategies'.



Sample Preview of The Chapter

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DISASTER MANAGEMENT

BLOCK-1 : INTRODUCTION

Meaning and Classification of Disasters



INTRODUCTION

Since the dawn of time, disasters, whether natural or man-made, have been a part of man's evolution. Even our ancestors have had to face disasters. Tsunamis, cyclones, earthquakes, floods, volcanic eruptions, wildfires, landslides and droughts are natural disasters whereas accidents, plane crashes, chemical disaster, forest fires can be referred as man-made disasters. These disasters proved fatal not only for the mankind and other living beings but also for economic and social loss and damage to the environment.

CHAPTER AT A GLANCE

MEANING OF DISASTER

The word disaster has its origin from the French word Desastre- 'des' means bad and 'aster' meaning star which comes as unfavorable star. Presently, disaster is an odd event that causes a huge loss of lives and property. According to Disaster Management Act, 2005, 'disaster means a catastrophe mishap calamity or grave occurrence in any area, arising from natural or man-made causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to and destruction of, property or damage to or degradation of environment and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area.' According to the International Federation of the Red Cross and Red Crescent Societies, 'A disaster is a sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material and economic or environmental losses that exceed the community's or society's ability to cope using its own resources. A disaster occurs when a hazard impact vulnerable people.'

Disaster affects society and causes various impacts such as loss of life and property, loss of livelihood, negative impact on economic and social structure, law and order problem, migration, disruption of communication, transport and infrastructure, etc. Despite these negative impacts, it opens up positive avenues of development and growth.

Disaster: Negative and Positive Aspects

Aspects	Negative	Positive
D	Damage	Development
I	Interruption	Innovation
S	Severe	Sharing
A	Antagonistic	Awareness
S	Scourge	Self-sufficiency
T	Trauma	Transformation
E	Emergency	Education
R	Risk	Resilience

TYPES OF DISASTERS

According to High Powered Committee Report disaster can be classified into two major groups and 30 odd disasters were grouped into the following five groups based on generic consideration:

1. Water and Climate Related Disasters-Flood, cyclones etc.
2. Geologically Related Disasters- Landslides and mudflows, Earthquakes, etc.
3. Chemical, Industrial and Nuclear Related Disasters
4. Accident Related Disasters-forest fires, oil spill, etc.
5. Biological Disasters-epidemics, pest attacks, etc.

NATURAL DISASTERS

Natural disasters are caused by the forces of nature which can be geophysical, hydrological, climatological and biological.

Earthquakes

The earth's lithosphere is made up of a number of interlocking plates. These plates tend to move or slip against each other, producing vibrations in the earth's crust. This sudden shaking of the earth is called an earthquake. Volcanic eruptions may also cause earthquakes. Earthquakes may lead to landslides, tidal waves and tsunamis. Magnitude scales, like the Richter magnitude scale, measure the size of the earthquake at its source. Level 6 and above of the earthquake may cause serious damage to the society and destruction of building and infrastructure.

Volcanic Eruptions

The spewing out of lava, ash, gases and rock fragments through a vent or opening at a weak spot in the earth's crust is known as volcanic eruption. Dangerous volcanic eruption is known as glowing avalanche with the temperature up to 1200°C. There are two modes in which the volcanoes usually erupt.

Explosive eruption: The gas contents are high and magma is thick and viscous. The sudden release of confining pressure allows the gases to boil explosively from the magma.

Effusive eruption: The gas content in the magma is low and the magma is of relatively low viscosity and the gases boil out less violently.

Landslides

A landslide occurs when masses of rock loosened by weathering move down a slope under the pull of gravity. The debris hurtling downhill carries with them huge boulders and uprooted trees. They can destroy buildings and bury roads and railway in their path. It can be caused by heavy rain, soil erosion as well as earth tremors and may also cause in areas under heavy snow. It can be associated with other hazards like tropical cyclones, severe local storms and river floods.

Tsunamis

Tsunamis are a series of very large waves with extremely long wavelength in the deep ocean which may be 100 km and more. It is also known as seismic sea wave. It is usually originated due to sudden displacement in the sea floor caused by earthquake, landslides or volcanic activity. The impact in coastal areas can be very destructive as the waves advance inland and can extend over thousands of kilometers. It is associated with earthquakes, volcanic eruptions,

mass movements, meteorite impacts and underwater explosions. Tsunamis can originate hundreds or even thousands of miles away from coastal areas.

Avalanches

Quantity of snow or ice sliding down a mountainside under the force of gravity is known as avalanche. It causes when the load on the upper snow layers exceeds the bonding forces of the entire mass of snow. A debris avalanche is a type of slide characterized by the chaotic movement of rocks, soil and debris mixed with water or ice. It can be further classified as 'dry snow type' or 'wet snow type'. These can be further divided into 'direct action' or 'delayed action'.

Floods

A flood is a condition in which vast areas of normally dry land are covered by water. Flood caused by overflowing of rivers are called riverine floods. Overflowing may occur when a large volume of rainwater or snowmelt enters a river channel or when a river becomes shallow due to deposition on its bed. Flash floods are defined as floods which occur within six hours of the beginning of heavy rainfall and are usually associated with cloud burst, storms and cyclones requiring rapid localized warning and immediate response if damage is to be mitigated.

Extreme Temperature

A heat wave is a condition of air temperature which becomes fatal to human body when exposed. Quantitatively it is defined based on the temperature thresholds over a region in terms of actual temperature or its departure from normal. A cold wave can be both a prolonged period of excessively cold weather and the sudden invasion of very cold air over a large area. Winter storms can result in flooding, storm surge, closed highways, blocked roads, drowned power lines and hypothermia.

Droughts

If the rainfall in a region is less than the normal by 20 per cent or more, it is considered deficient for that region. Deficient rainfall over a long period causes drought, which is characterized by water shortage, depletion of groundwater and crop damage. The severity of drought depends on the degree of moisture deficiency, duration of dry spells, extent of irrigation facilities and size of affected areas. A drought may trigger other disasters such as food insecurity, famine, malnutrition, epidemics and displacement of populations.

Wildfires

Wildfires include forest fires, grassland fires, bushfires, brush fires and other vegetation fire. It

MEANING AND CLASSIFICATION OF DISASTERS / 3

can be rapid under high temperature and high wind. They occur more in coniferous forest and evergreen broadleaf forests. Hot sunny days with low humidity and strong breeze are conducive to the rapid spread of fire in a forest. Generally, forest fire once started continues until there is heavy rain or the burning fuel is finished.

Cyclones and Storm Surges

Cyclone is a large air mass that rotates around a strong center of low atmospheric pressure counter-clockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere. A tropical cyclone is a storm system characterized by a low pressure centre and numerous thunderstorms that produce strong winds and flooding rain. It feeds on heat released when moist air rises resulting in condensation of water vapor contained in the moist air. According to the location and strength it can be referred to as hurricane, typhoon, tropical storm, cyclonic storm, tropical depression or cyclone.

Epidemics

The word epidemic is derived from Greek words epic means upon/among and demons mean people. It is the rapid spread of infection or disease to large number of people in a given population within a short period of time. Epidemics may be the result of disasters of another kind such as tropical storms, floods, earthquakes, droughts, etc. It may spread in animals causing local economic disasters. Diseases causing epidemics are communicable or transmissible such as hepatitis, typhoid, diphtheria, malaria, cholera, influenza, diarrhea, food poisoning etc.

MAN-MADE DISASTERS

Human error, negligence, the malfunction of equipment or the deliberate actions of man can lead to man-made disasters. This also includes environmental degradation, pollution and accidents. Some of the disasters can occur due to complex combination of both natural and man-made causes of vulnerability such as food insecurity, epidemics, conflicts and displaced populations, etc.

Complex Emergencies/Conflicts

This situation occurs due to internal or external conflict and requires an international response. In a nation, these conflicts involve warlike encounters between armed groups from the same country which take place within the borders. This situation leads to large scale medical problems such as epidemics, lack of water, accumulation of rubbish, displaced persons, refugees, food shortage, hunger, etc. Internationally,

war may break out between two or more countries causing large scale mass movement of refugees and displaced persons.

Famines

Severe drought or conflict can lead to an acute food emergency whereas chronic food insecurity is often a reflection of poverty, a worsening debt crisis and economic effects at household level of the HIV/AIDS pandemic or mismanagement or abuse of water resources. These cases can lead to unavailability and inaccessibility of food. Shortage of food reduces people's resistance of disease and trigger preventable diseases and water shortage leading to consuming polluted water trigger water borne diseases.

Displaced Populations

Displaced population leave their home to safe place as refugee influxes within a country due to disasters or armed conflict- usually need relief operations combined with efforts aiming at collective and lasting solutions. The responsibility for refugees and all displaced populations primarily rests with the host government.

Transport Accidents

These technological transport accidents involve mechanized modes of transport. These can be subdivided into four categories such as – accidents involving air, boat, rail and accidents involving motor vehicles on roads and tracks. Comprehensive rules and guidelines under various acts provide for safe transportation of hazardous chemicals or dangerous goods.

Industrial Accidents

Industries often produce or use hazardous substances, whose leakage can be disastrous for us and the environment. These accidents include explosions such as chemical explosion, nuclear explosion and mine explosion. If the explosion leads to another disaster the event will be classified as the resulting disaster.

- Pollution and degradation of one or more aspects in the environment by noxious industrial, chemical or biological wastes, from debris or man-made products and from mismanagement of natural and environmental resources.
- Acid rain-Acid rain is made up of highly acidic water droplet due to air emissions, most specifically the disproportionate levels of sulphur and nitrogen emitted by vehicles and manufacturing processes. It is often called acid rain as this concept contains many types of acidic precipitation.

OTHER CLASSIFICATION OF DISASTERS

Disasters are on the rise throughout the world due to human ignorance or neglect to certain key developmental issues. Disasters create pervasive uncertainty, suffering and trauma. It causes loss of lives and property, destroys infrastructure and productive capacity, interrupts economic activity and irreversible changes in a country's natural resources base. Disaster can be classified as compound and complex. Compound disasters are hazards such as disaster leading to other contingencies such as famines followed by civil strife, mass displacement of people, etc.

Complex disasters lead to collapse of the political authority or lead to some other complexity where the problem involved is political in nature such as communal bias in distribution of relief, etc.

CHECK YOUR PROGRESS

Q. 1. Define disaster and list its various types.

Ans. The term disaster has its origin from French word *Disastre* a combination of two words *Des* meaning bad and *Aster* meaning star; thus the term disaster refers to Bad or Evil star. Disasters are catastrophic events resulting in heavy losses in terms of human, animal and plant lives, injuries and disabilities and damage to property and environment. Disaster can also be seen as a consequence of inappropriately managed risk. These risks are the product of hazards and vulnerability. According to World Health Organization, a disaster is a sudden ecological phenomenon of sufficient magnitude to require external assistance. It is also defined as an event occurring suddenly that causes damage, ecological disruption, loss of human life, deterioration of health and health services and which exceeds the capacity of the affected community on a scale sufficient to require outside assistance. It leads to emergency situations. Disaster can be broadly divided into two categories:

- (i) Natural disaster
- (ii) Man-made disaster

About 30 odd disasters can be grouped into the following five groups based on generic consideration:

1. Water and Climate Related Disasters
 - Flood
 - Cyclones
 - Tornadoes and Hurricanes
 - Hailstorm
 - Cloud Burst
 - Heat Wave and Cold Wave

- Snow Avalanches
 - Droughts
 - Sea Erosion
 - Thunder and Lightning
 - Tsunami
2. Geologically Related Disasters
 - Landslides and Mudflows
 - Earthquakes
 - Dam Failures/Dam Bursts
 3. Chemical, Industrial and Nuclear Related Disasters
 - Chemical and Industrial Disasters
 - Nuclear Disasters
 4. Accident Related Disasters
 - Forest Fires
 - Urban Fires
 - Mine Fires
 - Mines Flooding
 - Oil Spill
 - Major Building Collapse
 - Serial Bomb Blasts
 - Festival Related Disasters
 - Electrical Disasters and Fires
 - Boat Capsizing
 - Village Fire
 5. Biological Disasters
 - Biological hazards
 - Epidemics
 - Pest Attacks
 - Cattle Epidemics
 - Food Poisoning.

Q. 2. Briefly discuss the nature of Earthquakes and Landslides.

Ans. An earthquake is a sudden, sometimes violent shaking of the earth's surface due to the release of energy under the earth's crust. It may last for seconds or minutes. Earthquakes can cause massive damage to life and property. There may be several earthquakes over a period of time ranging from hours to weeks called foreshocks and aftershocks. Earthquake is the most unpredictable natural disaster that strikes without any notice.

The earth consists of four major layers. Starting from the centre, these layers are known as inner core, outer core, mantle and crust. The inner core is almost solid iron whereas outer core is a mixture of molten iron and sulphur. Mantle has temperature between -30°C and 50°C . The outer layer of the earth is made of solid rock. It is a thin layer of 0-60 km thickness. The outer crust of the earth is not a one-piece landmass. It consists of seven big landmasses joined