

Disaster in Coastal area.

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Introduction:

Economic activities in coastal ocean environment account for substantial proportions of the gross domestic products of many maritime countries.

- This is due to growing reliance on
- Coastal and Marine living resources
- Coastal and Marine non-living resources
- Shipping and Trade and
- Coastal Tourism.

Types of Natural Disasters in Coastal Areas Related to Climate:

- Natural disasters in coastal areas can be categorised into three major types i.e. geological, biological and meteorological.
- 1) Geological
- Those driven by earth's internal energy, e.g. earthquakes and volcanoes.
- Those resulting from land surface processes or land use/cover changes (agriculture, mining, settlement, etc).
- Both these two processes can cause landslides, snow avalanches, river flooding, soil erosion, mudslides (collapsing soils) water and soil pollution, coastal flooding, ocean processes like storm surges, tsunamis, etc.

Impacts of Natural Disasters on Coastal Populations and Their Management:

- The effect of a disaster on populations may either be direct or indirect.
- Direct Impacts
- Direct impacts of a disaster involves injury, death to human beings, plants and animals, and damage to property.
- Indirect Impacts
- Indirect impacts are through a knock-on effect (after-shocks) from reduced economic resources caused by the disaster and disrupted ecosystems.

Impacts of Natural Disasters (Cont...)

- Tropical Cyclones and Storm Surges
- Over the centuries, the deadliest and the most destructive element of a tropical cyclone, has been the storm surge.
- Thousands of people living in low-lying coastal areas have lost lives and property through storm surges.

Impacts of Natural Disasters (cont..)Tsunamis

- A series of traveling ocean waves of extremely long length generated primarily by earthquakes, volcanic eruptions, outer-space meteorite splash or landslides occurring below or near the ocean floor.
- Tsunamis are a threat to life and property for all coastal residents living near the ocean.
- Although 80 of the tsunamis occur in the Pacific, they can also threaten coastlines of countries in other regions, including the Indian Ocean, Mediterranean Sea, Caribbean region, and even the Atlantic Ocean.

The Indian Ocean Tsunamis

- Slammed in more than 8 countries in the Indian Ocean realm and killed more than 160,000 people
- According to Asian Development Bank (ADB) Report, the number of the poor in India could rise by 645,000 and by 250,000 in Sri Lanka.
- In the Maldives, where about half the island nation's houses were affected, more than 50 per cent of the population could fall into poverty, ADB said.
- FAO, a UN agency, report reckons that Indian Ocean fisheries have been devastated by the tsunami, endangering the livelihoods of hundreds of thousands of families.

Floods

Floods are mainly triggered by severe thunderstorms, cyclones, the El-Nino related phenomenon or monsoons.

- In low-lying coastal areas, storm surges, tsunamis or rivers swollen by exceptionally high tides can cause flooding.
- Floods can threaten human life and property.

Landslides

- Land slides occur when heavy rains send large amounts of earth, rock, sand or mud flowing swiftly down mountain slopes.
- Land slides are intensified where vegetation is scarce due to bush fires, overgrazing, deforestation, impacts of droughts etc.
- Two weeks of continuous rainfall towards the end of 1999 saturated soils in Venezuela to the extent that thousands of landslides shot down Avila mountain in the state of Vargas, washing away towns, killing an estimated 15,000 people and costing almost US 2 billion.

Drought

- Droughts are a result of a natural reduction in precipitation over a long time
- When rainfall becomes relatively scant or infrequent, it can disrupt the normal balance between precipitation and the evaporation-transpiration process, and drought can begin
- Crops and livestock can die due to drought
- Hydro-electric power dams dry-up disrupting industrial activities
- Lack of adequate water for drinking and sanitation leads to malnutrition, thirst and disease outbreaks among humans and animals and
- The human, economic losses and costs due to environmental degradation mounts up rapidly

Climate and natural Disasters

Statistics show that over 70% of all natural disasters experienced in coastal areas all over the world are related to extreme climate events. Occurrence of one or more of climate related disasters may trigger other disasters (e.g. drought, floods)

- An increasing body of observations gives a collective picture of a warming world and other changes in the climate system.
- Cause rise in concentration of the main anthropogenic greenhouse gases in the lower atmosphere (carbon dioxide, methane and oxides of nitrogen) which affect the earth's radiation budget and lead to warming of the earth's surface.

Climate and Natural Disasters. Continue....

Global surface temperature has increased by between 0.4C and 0.8C since 1860 with the 1990s being the warmest decade

- Tide gauge data show that a rise in sea level during the 20th century is between 10cm and 20cm.
- Model simulations indicate that a doubling of carbon dioxide by the year 2100 will result in a mean global warming of 1.1 to 3.1 C and a sea level rise of 11 to 77cm.
- Global warming will cause mass expansion of sea water, melting of glaciers and rise in sea level.
- Scientific evidence already points towards a discernible climate change.
- This is likely to alter the frequency and magnitude of natural disasters associated with extreme climate events along the coastal areas.
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Integrated Management of Natural Disasters Along Coastal Areas

The best way to confront natural disasters is to

- Create a culture of safety among the communities at risk
- Enhance the capacity of the people living in vulnerable areas.
- Preparedness is key in helping communities manage the inevitable disasters when they do occur.
- This can only be achieved by having cross-sectoral approach in putting up early warning systems.
- As shown above, any sustainable management of disasters in the coastal areas will require the integration of climate information in all aspects of planning.

Natural Disasters Preparedness and Adaptation for Coastal Areas

This should cover

- 1. Establishment of early warning systems and capacity building of the national institutions responsible for data collection, analysis and issuance of forecasts and warnings of the disasters.
- The warnings need to be
- Very Accurate to invite confidence to the targeted community
- Timely to allow a high degree of preparedness and
- Mechanisms need to be in place to facilitate immediate and effective response.

Natural Disaster Preparedness and Adaptation for Coastal Areas (cont...)

- Risk assessments and zoning of the land-use practices in the coastal areas and proper planning of development at the coastal zone.
- Introduction of Government policies to protect vulnerable communities.
- Evacuation plans to be followed in the event of a disaster happening or receiving a warning of an impending disaster.

Natural Disaster Preparedness and Adaptation for Coastal Areas (cont...)

- In the case of Tsunamis, Cyclones, Storm
- Surges and Floods these initiatives
- should include
- Protection of life and property including
- buildings through construction of
- seawalls, barrages, dykes, coastal
- embankments and dams.

Natural Disaster Preparedness and Adaptation for Coastal Areas (cont...)

- In the case of Landslides
- Initiatives should be directed towards
- Construction of hydraulic structures to control the flows
- Construction of channels or deflection walls to direct flow around buildings
- Planting of ground cover on slopes and
- Building retaining walls in mudflow areas
- Construction of sediment control dams and
- Afforestation.

Natural Disaster Preparedness and Adaptation for Coastal Areas (cont...)

- In the case of Droughts Preparedness and adaptation, initiatives should be directed towards developing drought-resilience policies designed to head off adverse impacts. These include policies on
- The boosting of water supplies in vulnerable coastal areas
- Introduction of water conservation programmes
- Irrigation as a tool to reduce adverse impacts of droughts
- Water recycling in cities
- Encouragement of the use of statistical techniques of data, particularly rainfall, to find systematic patterns like trends, persistence or cycles

Natural Disaster Preparedness and Adaptation

- Coastal Areas (cont...)
In the case of Disease Outbreaks and Health Related Disasters Initiatives should
- include formation of permanent Search and Rescue teams to carry out relief and rehabilitation initiatives. The team should have the capacity to provide services like medical care, clean water, balanced food, etc.

Natural Disaster Preparedness and Adaptation for Coastal Areas (cont...)

- Disaster Managers need to put in place elaborate evacuation plans to be followed in the event of a disaster happening or receiving a warning of an impending disaster. Specifically
- A secure and reliable communication system need to be in place for rapid response
- An elaborate evacuation procedure and transport arrangement
- Emergency pathways (routes) to safe areas (shelters and high grounds) properly highlighted.
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Mitigation Strategies

Disaster preparedness will have to include the

- following
- Evacuation measures
- Provision of medical aid
- Prompt disposal of dead bodies and animal carcasses
- Preventive means against epidemics
- Supply of food and safe drinking water.

Conclusion and way forward

.In order to mitigate the effects of natural disasters in coastal areas, it is necessary to understand the dynamics of the processes involved and give accurate and timely early warnings

- Over 70 of natural disasters in coastal areas are climate related.Hence, management of these disasters will need the integration of weather and climate Monitoring in the process.
- Capacity building in areas of observing the ocean and the atmosphere for accurate and timely forecasts of extreme climate events is necessary.
- Cross-sectoral multi-hazard approach and coordination between various agencies is necessary in the effective management of coastal disasters.

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