

An analysis on the disaster from the perspective of Indian History

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Introduction

Disaster management is a critical aspect of governance, especially in a country like India, which is prone to various natural and man-made disasters. From earthquakes and floods to cyclones and industrial accidents, India's diverse geography and climate make it susceptible to a wide array of calamities. This article explores the major disasters faced by India in recent years, the strategies employed for disaster management, the precautions taken to mitigate risks, and the technological advancements in this field.

Key Words - mitigate risks, recurrent issue, resilient, dissemination

1. Understanding Disaster Management

Disaster management encompasses the processes involved in preparing for, responding to, and recovering from disasters. It includes various phases:

- **Mitigation:** Reducing the impact of disasters.
- **Preparedness:** Planning and training for potential disasters.
- **Response:** Immediate actions taken during a disaster.
- **Recovery:** Restoring affected areas back to normalcy.

1.1 Importance of Disaster Management in India

India's vulnerability to disasters necessitates a robust disaster management framework. Effective management can save lives, reduce economic losses, and ensure a quicker recovery.

2. Major Disasters in India

2.1 Earthquakes

India has experienced several significant earthquakes throughout its history. Here are some of the major ones:

1. 1918 Bihar Earthquake

- **Magnitude:** 8.4
- **Location:** Bihar
- **Impact:** One of the deadliest earthquakes in Indian history, it caused extensive damage and resulted in around 1,500 fatalities.

2. 1943 Assam Earthquake

- **Magnitude:** 8.1
- **Location:** Assam
- **Impact:** Caused significant destruction in Assam and parts of neighbouring countries, with thousands of casualties and widespread damage.

3. 1960 Arunachal Pradesh Earthquake

- **Magnitude:** 8.6
- **Location:** Arunachal Pradesh
- **Impact:** While causing considerable damage, the remote location limited its impact on populated areas.

4. 1976 Tangshan Earthquake

- **Magnitude:** 7.5
- **Location:** Tangshan (near India's border)
- **Impact:** Though primarily affecting China, its effects were felt in parts of northern India.

5. 1993 Latur Earthquake

- **Magnitude:** 6.4
- **Location:** Latur, Maharashtra
- **Impact:** Resulted in over 8,000 deaths and widespread destruction, marking one of the most devastating earthquakes in urban India.

6. 2001 Gujarat Earthquake

- **Magnitude:** 7.7
- **Location:** Bhuj, Gujarat
- **Impact:** Caused around 20,000 deaths and extensive damage, leading to major reconstruction efforts.

7. 2011 Sikkim Earthquake

- **Magnitude:** 6.9
- **Location:** Sikkim
- **Impact:** Caused several fatalities and significant damage to infrastructure in the region.

8. 2015 Nepal Earthquake

- **Magnitude:** 7.8
- **Location:** Nepal (with effects felt in northern India)
- **Impact:** Resulted in thousands of deaths in Nepal and affected parts of northern India.

9. 2020 Tremors in Delhi-NCR

- **Magnitude:** 4.7
- **Location:** Delhi-NCR Region
- **Impact:** While not very strong, it raised concerns about earthquake preparedness in the densely populated area.

Preparedness and Mitigation

India is prone to earthquakes due to its tectonic settings. Various measures, including building codes, early warning systems, and public awareness campaigns, are being implemented to mitigate risks.

Losses to India

Estimating the overall expected loss to India from major earthquakes involves various factors, including economic damages, loss of life, and impacts on infrastructure. Here's a general overview of the expected losses from significant earthquakes in India:

1. Economic Losses

- **1918 Bihar Earthquake:** Estimated losses in the range of several hundred million USD (historical context).
- **1943 Assam Earthquake:** Similar to the Bihar quake, with losses estimated in the hundreds of millions.
- **1993 Latur Earthquake:** Economic losses were around \$2 billion.
- **2001 Gujarat Earthquake:** Estimated losses were about \$5 billion, with extensive damage to buildings and infrastructure.
- **2011 Sikkim Earthquake:** Estimated losses were around \$600 million.
- **2015 Nepal Earthquake (impacting India):** Estimated losses in India were around \$100 million.

2. Loss of Life

- **1918 Bihar Earthquake:** Approximately 1,500 fatalities.
- **1943 Assam Earthquake:** Thousands of casualties.
- **1993 Latur Earthquake:** Over 8,000 fatalities.
- **2001 Gujarat Earthquake:** About 20,000 deaths.
- **2011 Sikkim Earthquake:** Several hundred fatalities.

3. Infrastructure Damage

- Major earthquakes often lead to significant damage to housing, roads, schools, and hospitals, which can take years to rebuild and result in long-term economic impacts.

4. Long-Term Impacts

- Beyond immediate economic losses, earthquakes can disrupt local economies for years, leading to increased poverty and reduced economic growth in affected areas.

While exact figures can vary, estimates suggest that cumulative losses from major earthquakes in India could reach tens of billions of dollars, considering both direct and indirect impacts. Continuous efforts in disaster preparedness and resilient infrastructure development are essential to mitigate these losses in the future.

2.2 Floods

Flooding is a recurrent issue, especially in states like Assam and Bihar. India has experienced several major floods since gaining independence in 1947. Some of the most significant flood events:

1. 1954 Assam Floods

- **Location:** Assam
- **Impact:** Triggered by heavy monsoon rains, these floods affected millions, displacing thousands and causing extensive damage to agriculture and infrastructure.

2. 1966 Bihar Floods

- **Location:** Bihar
- **Impact:** The Kosi River overflowed, leading to widespread flooding. Approximately 1.5 million people were affected, with severe damage to crops and property.

3. 1978 Bihar Floods

- **Location:** Bihar
- **Impact:** Another devastating flood caused by the Kosi River, displacing over 1 million people and leading to significant loss of life and property.

4. 1987 Bihar Floods

- **Location:** Bihar
- **Impact:** The floods affected over 10 million people, resulting in thousands of deaths. The scale of destruction prompted national attention and relief efforts.

5. 1998 Assam Floods

- **Location:** Assam
- **Impact:** Heavy rainfall led to the Brahmaputra River overflowing, affecting over 2 million people and causing significant agricultural damage.

6. 2004 Maharashtra Floods

- **Location:** Maharashtra
- **Impact:** Torrential rains led to severe flooding in Mumbai and surrounding areas, resulting in over 1,000 deaths and extensive damage to infrastructure.

7. 2008 Bihar Floods

- **Location:** Bihar
- **Impact:** Triggered by the breach of the Kosi River embankment, these floods affected around 3 million people, causing widespread displacement and destruction.

8. 2010 Leh Floods

- **Location:** Ladakh

- **Impact:** Cloudbursts triggered flash floods, leading to landslides and significant loss of life (over 200 fatalities) and damage to infrastructure.

9. 2013 Uttarakhand Floods

- **Location:** Uttarakhand
- **Impact:** Heavy rains and landslides led to catastrophic flooding, causing over 5,700 deaths and extensive destruction of roads, bridges, and homes.

10. 2015 Chennai Floods

- **Location:** Tamil Nadu
- **Impact:** Unprecedented rainfall led to severe flooding in Chennai, with over 500 deaths and significant damage to infrastructure and housing.

Flooding in India is often exacerbated by monsoon rains, river management issues, and climate change. Each flood event has highlighted the need for improved disaster management strategies and infrastructure resilience to mitigate future impacts. It affected millions of lives where thousands of people faced losses of lives and infrastructure as well.

2.3 Cyclones

The eastern coast of India is frequently hit by cyclones. Cyclone Phailin in 2013 was one of the strongest to impact the state of Odisha, leading to widespread destruction. India has experienced several devastating cyclones over the years, leading to significant loss of life and property. Here's a list of some major cyclones along with their impacts:

1. Cyclone 1998 (Orissa Cyclone)

- **Date:** October 1999
- **Location:** Odisha
- **Deaths:** Approximately 10,000
- **Impact:** One of the deadliest cyclones in Indian history, it caused widespread destruction, displacing millions and causing extensive agricultural damage.

2. Cyclone 2004 (Gonu)

- **Date:** June 2007
- **Location:** Gujarat
- **Deaths:** Around 500
- **Impact:** Although it affected several countries, it caused significant rainfall and damage in Gujarat, leading to flooding and infrastructure damage.

3. Cyclone 2008 (Nisha)

- **Date:** November 2008
- **Location:** Tamil Nadu
- **Deaths:** Over 200

- **Impact:** Caused heavy rains and flooding in Tamil Nadu, leading to loss of life and property.

4. Cyclone Phailin

- **Date:** October 2013
- **Location:** Odisha
- **Deaths:** Approximately 45
- **Impact:** One of the strongest cyclones to hit Odisha, Phailin caused extensive damage but also demonstrated the effectiveness of early warning systems and evacuation efforts.

5. Cyclone Ockhi

- **Date:** November-December 2017
- **Location:** Kerala and Tamil Nadu
- **Deaths:** Around 200
- **Impact:** Caused heavy rainfall and flooding, leading to significant loss of life and disruption.

6. Cyclone Fani

- **Date:** May 2019
- **Location:** Odisha
- **Deaths:** Approximately 89
- **Impact:** One of the strongest cyclones to hit Odisha in decades, Fani caused extensive damage to infrastructure, agriculture, and housing.

7. Cyclone Amphan

- **Date:** May 2020
- **Location:** West Bengal and Odisha
- **Deaths:** Over 100
- **Impact:** This super cyclone caused massive destruction in West Bengal, displacing millions and leading to significant economic losses.

Cyclones in India often result in large-scale evacuations, infrastructure damage, and loss of life. The government's focus on improving early warning systems and disaster preparedness has helped reduce fatalities in recent years, though challenges remain.

2.4 Industrial Disasters

The Bhopal Gas Tragedy of 1984 remains one of the worst industrial disasters in history, causing thousands of deaths and long-term health effects on the local population. India has witnessed several major industrial disasters, resulting in significant loss of life, environmental damage, and economic impact. Some of the most notable incidents are:

1. Bhopal Gas Tragedy (1984)

- **Location:** Bhopal, Madhya Pradesh
- **Incident:** A gas leak from the Union Carbide pesticide plant released methyl isocyanate (MIC).
- **Deaths:** Estimated 3,000-15,000 (immediate and long-term effects).
- **Impact:** Considered one of the world's worst industrial disasters, it caused widespread health issues and long-term environmental contamination.

2. Chasnala Mining Disaster (1975)

- **Location:** Dhanbad, Jharkhand
- **Incident:** A coal mine flooded after a dam burst.
- **Deaths:** 372 miners.
- **Impact:** Highlighted the dangers of mining operations and led to calls for improved safety regulations.

3. Sewri Oil Spill (2004)

- **Location:** Mumbai
- **Incident:** A tanker accident led to a large oil spill in the Arabian Sea.
- **Deaths:** No direct fatalities reported, but significant environmental impact.
- **Impact:** Caused extensive damage to marine life and coastal ecosystems.

These disasters have highlighted critical issues regarding industrial safety, environmental regulations, and disaster management in India. Continuous improvements in safety standards and emergency preparedness are essential to prevent future incidents.

3. Government Response and Strategies

3.1 Policy Framework

The Indian government has established various policies and institutions dedicated to disaster management:

- **Disaster Management Act, 2005:** This act led to the formation of the National Disaster Management Authority (NDMA) and State Disaster Management Authorities (SDMAs).
- **National Policy on Disaster Management, 2009:** This policy emphasizes a proactive approach, focusing on risk reduction and preparedness.

3.2 Institutional Framework

The NDMA is responsible for planning and coordinating disaster management at the national level. It works in tandem with state authorities and local bodies to ensure a comprehensive approach.

3.3 Training and Capacity Building

Training programs are conducted to equip officials, volunteers, and communities with the knowledge and skills required for effective disaster response. Regular drills and simulations help in improving preparedness.

4. Precautions and Risk Reduction Measures

4.1 Early Warning Systems

India has developed an extensive early warning system for cyclones and floods. The India Meteorological Department (IMD) plays a crucial role in forecasting weather-related disasters and disseminating information.

4.2 Infrastructure Development

Investing in resilient infrastructure is vital for minimizing disaster impacts. The government promotes the construction of flood-resistant buildings and earthquake-proof structures.

4.3 Community Involvement

Community-based disaster management programs empower local populations to take an active role in preparedness and response. Training local volunteers ensures a quicker response during emergencies.

5. Technological Innovations in Disaster Management

5.1 Remote Sensing and GIS

Remote sensing and Geographic Information Systems (GIS) are used for mapping disaster-prone areas, monitoring environmental changes, and planning effective responses.

5.2 Drones and UAVs

Unmanned Aerial Vehicles (UAVs) are increasingly being utilized for damage assessment, search and rescue operations, and delivering supplies to inaccessible areas.

5.3 Mobile Applications

The government has developed various mobile applications to disseminate information, provide alerts, and facilitate communication during disasters. Apps like 'DISHA' are designed to help citizens access disaster-related information quickly.

5.4 Social Media

Social media platforms play an essential role in information dissemination and community engagement during disasters. They help in coordinating relief efforts and keeping the public informed.

6. Steps Taken During Disasters

6.1 Emergency Response

During a disaster, the government mobilizes resources quickly. The NDMA coordinates with state authorities to deploy rescue teams, medical assistance, and relief materials.

6.2 Relief and Rehabilitation

Post-disaster, the government provides immediate relief in terms of food, shelter, and medical care. Long-term rehabilitation plans are developed to rebuild affected communities.

6.3 Financial Assistance

The government allocates funds for disaster response and recovery through various schemes, including the National Disaster Response Fund (NDRF).

7. Challenges in Disaster Management

Despite the advancements, India faces several challenges in disaster management:

- **Lack of Awareness:** Many communities remain unaware of disaster preparedness measures.

- **Resource Limitations:** Limited financial and human resources can hinder effective response.
- **Urbanization:** Rapid urbanization increases vulnerability to disasters, particularly in informal settlements.

8. Conclusion

Disaster management in India is a multifaceted challenge that requires continuous improvement and innovation. The government, along with various stakeholders, must work collaboratively to build resilience against future disasters. By leveraging technology, enhancing community involvement, and fostering awareness, India can mitigate the impacts of disasters and ensure a safer future for its citizens.

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