



PREVENTION, MITIGATION AND PREPAREDNESS FOR DISASTERS: ROLE OF UN COPUOS IN DISASTER MITIGATION AND INDIAN PROGRESS

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Our Objectives

- To know what are NEOs and their impact
- Disaster Management Approaches
- Approaches to deal with NEO impact
- Current developments
- Legal and Policy related issues
- Way Forward



What are Near Earth Objects?

- NEOs are the asteroids or comets orbiting the Earth
- Found generally in region between Mars and Jupiter and beyond Neptune's orbit in outer region of Solar system
- Lesser probabilities of occurrence but greater impact if happens

The NEO Threat

- Earth's atmosphere can deal with impacts from objects below 40 m diameter. Only dust or debris reaches the surface of the earth which is unable to cause any big explosion
- If they are less than two km in diameter: Destroy a large city or small country
- If they are more than two km in diameter: Global catastrophe
- If more than five km in diameter: Extinction of the inhabitants



Planetary Defense

- Encompasses capabilities and activities associated with detecting the possibility of potential asteroid or comet impacts with Earth, providing warning, and preventing such impacts or mitigating their consequences.

Elements of Planetary Defense

Detection

Deflection

Global Collaboration

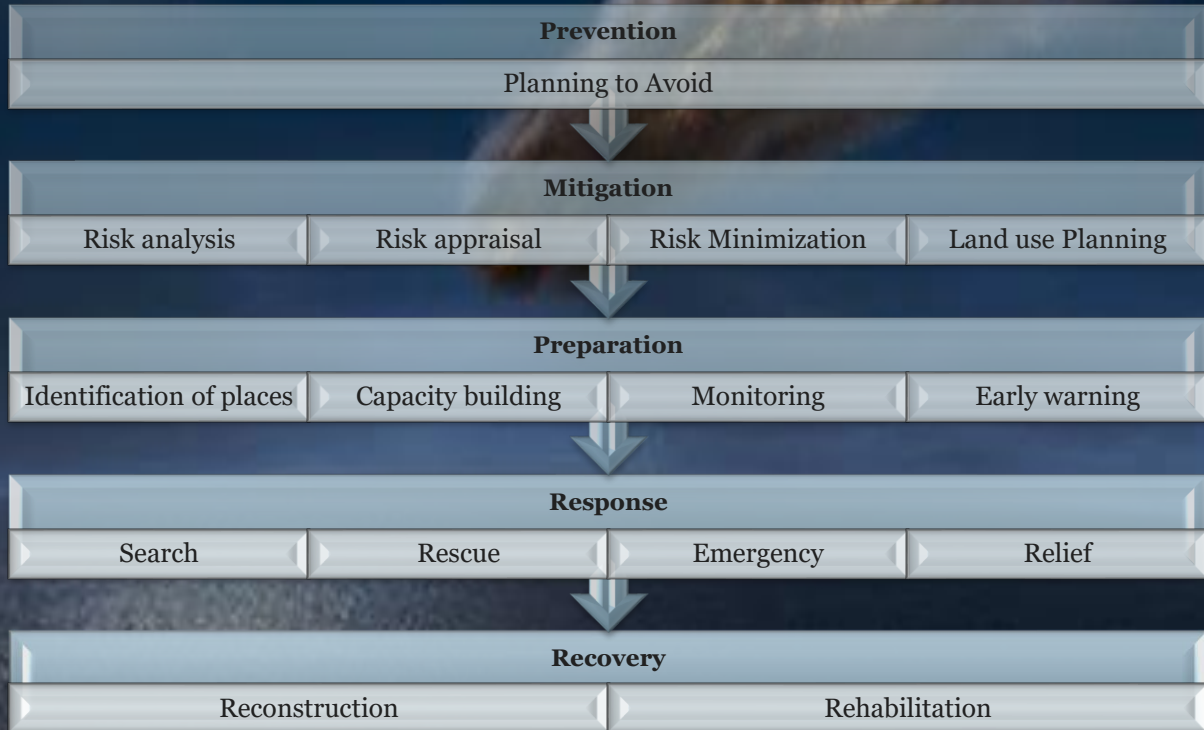
Outreach and Education

Evacuation and Recovery

Traditional Disaster Management System



Key elements in each stage



Where do we stand?

Earth-oriented Disasters	Threats from Outer-Space
Sufficient awareness	Lesser awareness due to limited discussion
Plans and Policies	Limited plans and policies
Available technology	Technology in the stage of development

Planetary Defense: Present day

- US rolled out directive in January 2021
- International Asteroid Warning Network and the Space Mission Planning Advisory Group (SMPAG) have agreed on criteria and thresholds for impact-response actions
- Projects such as International Asteroid Discovery Project conducted to bring awareness
- Coordination centres such as Near Earth Object Coordination Centre for computing earth impact

Planetary Defense: ESA

- ESA contributing to NASA-funded Asteroid Impact and Deflection Assessment
- Double Asteroid Redirection Test by NASA and Hera Mission by ESA
- Near-Earth Objects Dynamic Site (NEODyS) system, developed by the University of Pisa in Italy
- NEOShield and NEOShield 2 programs by EU
- Flyeye Telescope by ESA

Planetary Defense

How much is India equipped?

- No current plan to deal with NEO impact
- ISRO has initiated studies on Near Earth Objects and deflection strategies for Near Earth Asteroids
- ISRO Space Situational Awareness (SSA) Control Centre: for monitoring and protecting space assets
- Network for space object Tracking and Analysis (NETRA) established
- Memorandum of Understanding (MoU) between Indian Space Research Organization (ISRO) and Indian Institute of Astrophysics (IIA)

Legal and Policy Matters

- **Rationale:** devastating impact on the world
- **Reason:** World as a community
- We have come from *res nullis* to *res communis* and have accepted the concept of ‘community rights’
- **Need:** holistic approach
- **Moral and legal duty:** towards underdeveloped, undeveloped and developing nations
- Sharing of responsibilities

Way Forward



Communication

- Amongst the masses
- With the government
- With specialized agencies

Cooperation

- Globally
- Inter-government

Coordination

- Amongst the agencies

Collaboration

- Nations
- Governments
- Agencies



Prevention

Mitigation

Preparedness

Response

Recovery



What do we need?

- Communication of relevant knowledge
- Capacity building
- Periodic assessment and mock drills
- Dialogue and cooperation in the community: global, national and regional
- Collaboration amongst government and specialised agencies
- Promotion of academic, scientific and research entities
- Creation of specialised committee under UN COPUOS

A meteor streaks across a dark night sky, leaving a long, glowing trail of white and yellow light. In the upper left corner, a bright, full moon is visible. The bottom of the image shows a dark, curved horizon line, possibly representing the Earth's surface.

Thank you