iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 14 **Issue:** II **Month of publication:** February 2026

DOI: https://doi.org/10.22214/ijraset.2026.77733

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 14 Issue II Feb 2026- Available at www.ijraset.com

Disaster Management on Earthquake

Dhanawade Pranali Dilip[1], Sarje Rutuja Bharat[2], Ghodake Asmita Naganath[3], Chavan Mansi Purushottam[4], Khatke Shivanjali Mohan[5]

[1-5ss]*Student 3rd Year Civil Engineering, Karmayogi Institute Of Technology Polytechnic , Shelve-Pandharpur*

[6] *Professor, Dept. of Civil Engineering, Karmayogi Institute Of Technology Polytechnic , Shelve-Pandharpur*

Abstract: ***Earthquakes are one of the most destructive natural disasters, leading to heavy damage, loss of lives, and long-term social and economic problems. Proper disaster management is necessary to reduce these effects and to help communities recover and remain strong. This abstract describes the main parts of earthquake disaster management, such as preparedness, mitigation, response, and recovery. Preparedness includes creating public awareness, developing early warning systems, and conducting practice drills. Mitigation focuses on safe construction practices and proper land-use planning to decrease the risk of damage to buildings. Immediate response activities like search and rescue operations, emergency medical services, and effective communication systems are very important after an earthquake occurs. Long-term recovery includes rebuilding damaged infrastructure, restoring sources of income, and providing mental support to affected people. Modern technology, government support, and active involvement of local communities are important for improving disaster management. By combining all these measures, communities can reduce earthquake damage and recover more quickly and effectively.***

Keywords: Earthquakes, Disaster Management, Preparedness, Mitigation, Emergency Response, Recovery, Early Warning Systems, Community Resilience

I. INTRODUCTION

A. Background

An earthquake is the sudden shaking of the Earth's surface caused by the movement of tectonic plates beneath the crust. This movement releases a large amount of energy in the form of seismic waves, leading to ground vibrations and sometimes tsunamis. Earthquakes are unpredictable natural disasters that can cause severe damage to buildings and infrastructure, loss of lives, and disruption of essential services.

B. Need for Disaster Management

Disaster management focuses on minimizing the harmful effects of earthquakes through proper preparedness, response, and recovery planning. It includes creating awareness, conducting training programs, developing early warning systems, and constructing earthquake-resistant buildings. In India, due to its varied geological structure and different seismic zones, earthquake preparedness plays a crucial role in national disaster management planning.

C. Objectives of the Study

The study aims to understand the causes and impacts of earthquakes, examine disaster management strategies, analyze past earthquake case studies to learn important lessons, and explore how technology and engineering solutions can help reduce earthquake damage.

1) Sub Heading 1

Effects of Earthquakes (In Points)

- Damage to buildings, roads, and bridges
- Loss of human lives and injuries
- Landslides and cracks in the ground
- Tsunamis (in coastal areas)
- Disruption of electricity, water, and communication services
- Fear and panic among people

2) Sub Heading 2

Role of Technology in Earthquake Management

- Early warning systems to alert people before shaking starts

©IJRASET: All Rights are Reserved

- Seismic monitoring and detection using sensors and satellites
- Designing earthquake-resistant buildings and infrastructure
- Communication systems for quick rescue and relief operations
- Mapping high-risk zones to plan safer cities and towns

HEADING 2

Causes of Earthquakes

- Movement of tectonic plates
- Faults in the Earth's crust
- Volcanic eruptions
- Landslides
- Human activities like mining or drilling

Table -1: Sample Table format

Sr. No.	Component	Estimated Cost (₹)
1	Study materials (books, journals, printouts)	300
3	Stationery (files, charts, papers, pens)	150
4	Printing and binding of project report	250
7	Plywood	200
8	Foam Board	300
10	PVC Pipes	100
11	Magnet	900
12	Paint	100
	Total estimated cost	2300rs

- Study materials like books, journals, and printouts cost ₹300.
- Stationery items such as files, charts, papers, and pens cost ₹150.
- Printing and binding the project report is estimated at ₹250.
- Plywood required costs ₹200.
- Foam board materials cost ₹300.
- PVC pipes needed are estimated at ₹100.
- Magnets cost ₹900.
- Paint expenses are ₹100.
- The total estimated cost for all components is ₹2300.

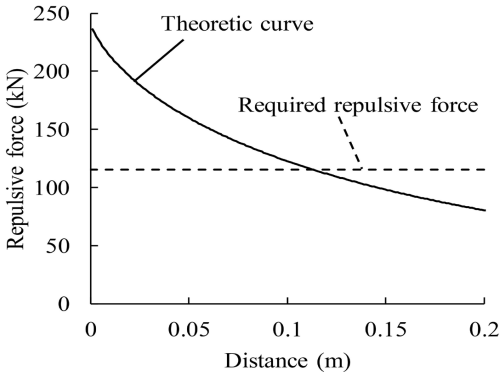


Chart -1: Name of the chart

The graph shows that repulsive force Decreases as distance increases. The Theoretical force is strong at close distances but drops below the required minimum force of 120 kN beyond about 0.13 meters. This helps identify the distance range where the repulsive force is sufficient for practical use.

EARTHQUAKE OCCURS
↓
SENSOR DETECTION / EARLY WARNING
↓
COMMUNICATION NETWORK (Alerts to Public & Authorities)
↓
ACTIVATION OF DISASTER RESPONSE TEAM
↓
RESCUE & RELIEF OPERATIONS
↓
DAMAGE ASSESSMENT AND REHABILITATION
↓
REVIEW AND MITIGATION MEASURES

Fig -1: Block Diagram

Earthquake disaster management involves a series of coordinated steps starting with the detection of tectonic movements causing ground shaking. Seismic sensors provide early warnings that trigger alerts sent to the public and authorities. Disaster response teams are quickly mobilized to carry out rescue and relief operations, including medical aid and shelter. Following the immediate response, damage assessment is conducted, essential services are restored, and rebuilding efforts begin with a focus on earthquake-resistant designs. Finally, a thorough review is done to improve early warning systems, public awareness, and future preparedness plans.

II. CONCLUSIONS

The project on earthquake disaster management concludes that while earthquakes cannot be prevented, their impact can be greatly reduced through proper planning, preparedness, and effective management. It highlights the need for earthquake-resistant construction, strict building codes, and public awareness. Coordinated efforts from government, NGOs, and communities are crucial for minimizing damage and ensuring timely response and recovery. Disaster management is an ongoing collective effort requiring science, administration, and community involvement to build resilient and safe societies.

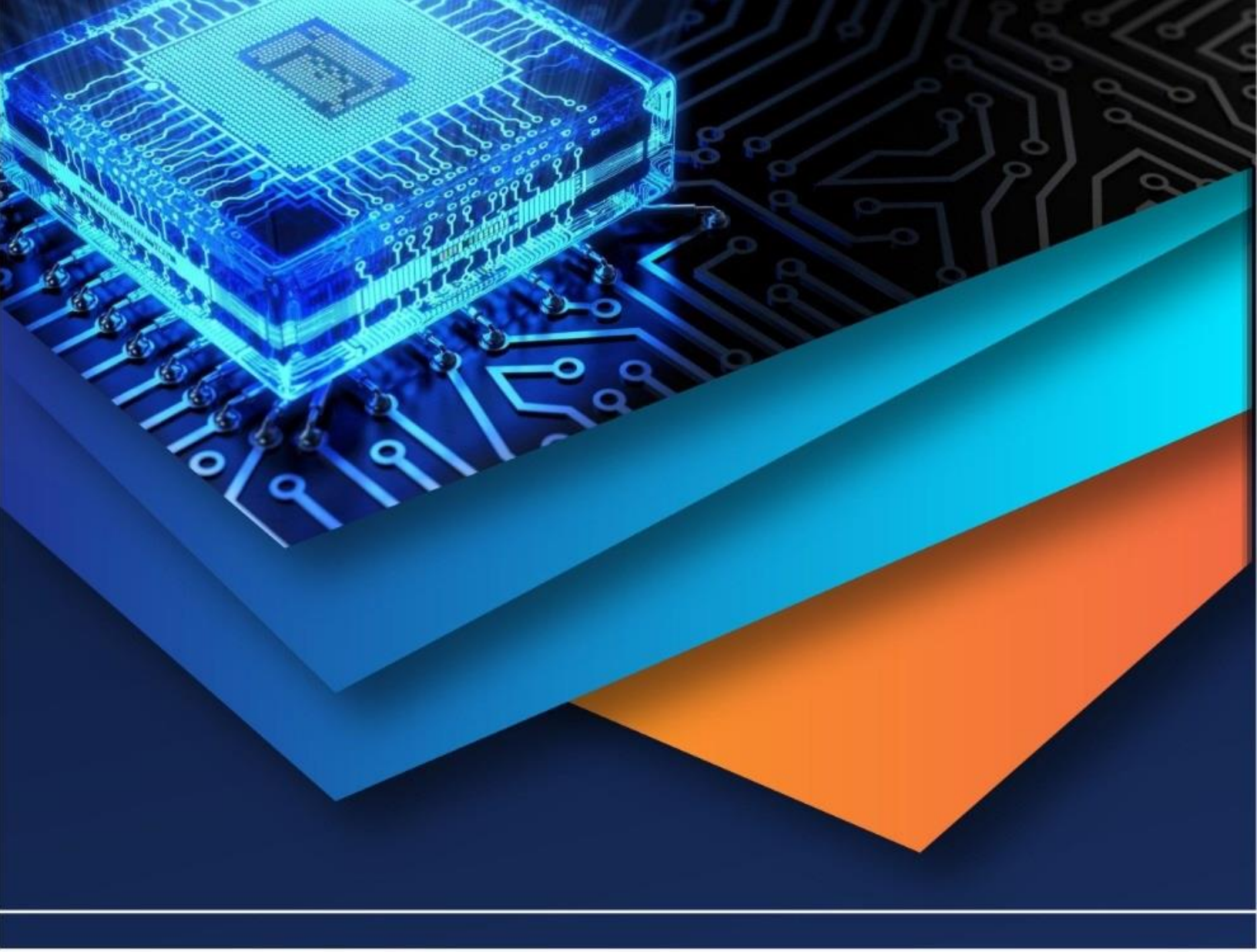
III. ACKNOWLEDGEMENT

The authors can acknowledge any person/authorities in this section. This is not mandatory.

REFERENCES

[1] Bolt, B.A. (1999). Earthquakes. W.H. Freeman & Co.
[2] (2007). National NDMA Disaster Management Guidelines – Management of Earthquakes. Government of India.
[3] Sinha, R., & Adarsh, R. (1999). Seismic Design of Structures. Tata McGraw Hill.
[4] Kramer, S.L. (2003). Geotechnical Earthquake Engineering. Pearson Education

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)