

नव वर्ष की हार्दिक शुभकामनाये

EARTH ROOT

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"THE EARTH IS WHAT WE ALL HAVE
IN COMMON."

—WENDELL BERRY



About E-magazine

“Earth Root” is an open access e-magazine in the discipline of Environmental sciences published by Earth Root Foundation. The aim of the e-magazine is to provide information and upgradation of knowledge about environmental issues on wider scale and to share ideas and resources to the readers. Using essential knowledge people can lead a healthy life, which is more sustainable and can connect with ongoing efforts for stopping catastrophically the climate change. E-magazine caters to all related environmental aspects ranging from big issues like climate change, renewable energy and pollutants in the atmosphere to the health of human and living beings on Earth. We also take topics of water resources and efforts and measurement to provide optimum use of it; including large scale atmospheric circulation linked with oceans and ecology.

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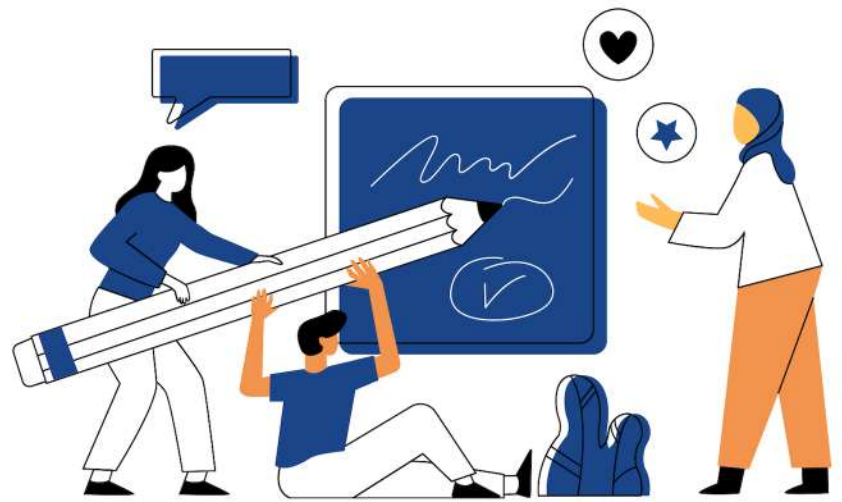
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ELECTROMAGNETIC POLLUTION

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Electromagnetic pollution is type of pollution that is caused by electromagnetic activity. Considered a type of electro smog. In today's world has to deal with electromagnetic pollution as a result of the exponential proliferation of wireless communication devices and the infrastructure that supports them. Radiation exposure varies among the population, and as technology develops. An invisible energy wave is released by power lines, computers, microwaves, Wi-Fi routers, and other gadgets. electromagnetic pollution has an indirect impact on people's quality of life. Radiation can be estimated regarding force or power, electrical, attractive and electromagnetic recurrence. Power transmission lines and electrical gadgets are viewed areas of strength for as of electromagnetic fields and radiation of low frequencies yet extreme focuses. The possible symptoms are: sleep disorders, insomnia, burning of the skin, headaches, lack of concentration, fatigue and weight loss. Low-frequency electromagnetic radiation poses little danger to human health, but long-term exposure to it could be harmful, especially to the nervous system and cognitive function of the brain.

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The main sources of low-frequency electromagnetic fields are high-voltage lines, electrical installations or household appliances (refrigerator, television, radio, microwave oven or any other appliance connected to the outlet). Sources of high-frequency fields are the transmitters used for radio and TV transmissions, antennas for mobile communications, fixed wireless telephones, maritime and air navigation systems, radars. So, almost all man-made electromagnetic devices, from common sockets to parabolic and telecommunications antennas, have energy losses in the environment, which is called electromagnetic pollution.

In order to limit its effects as much as possible, it is vital to respect the rules established by the authorities and to carry out constant monitoring, but also to take into account certain recommendations in this regard.

[1] When using a mobile phone, the safest way to limit electromagnetic pollution is to use speakerphone mode or Bluetooth. This means emitting a lesser level of radiation

[2] It is also not endorsed to use the mobile phone in elevators, cars, trains or airplanes, because it consumes more energy and produces more radiation in closed metal spaces.

[3] Detaching your Wi-Fi router when not in use is an effective protection measure against electromagnetic pollution.

[4] Activities with possible harmful effects are subject to an assessment process called environmental audit.

[5] Also, the companies that have environment authorization must collaborate with a consultant who gathers the most important information regarding the activities that have the potential to generate various environmental problems.

[6] The International Non-Ionising Radiation Committee (INIRC) of the International Radiation Protection Agency (IRPA), collaborating with Environmental Health Division of World Health Organisation have developed health criteria documents on non-ionising electromagnetic radiation which are part of the WHO Environmental Health Programme.

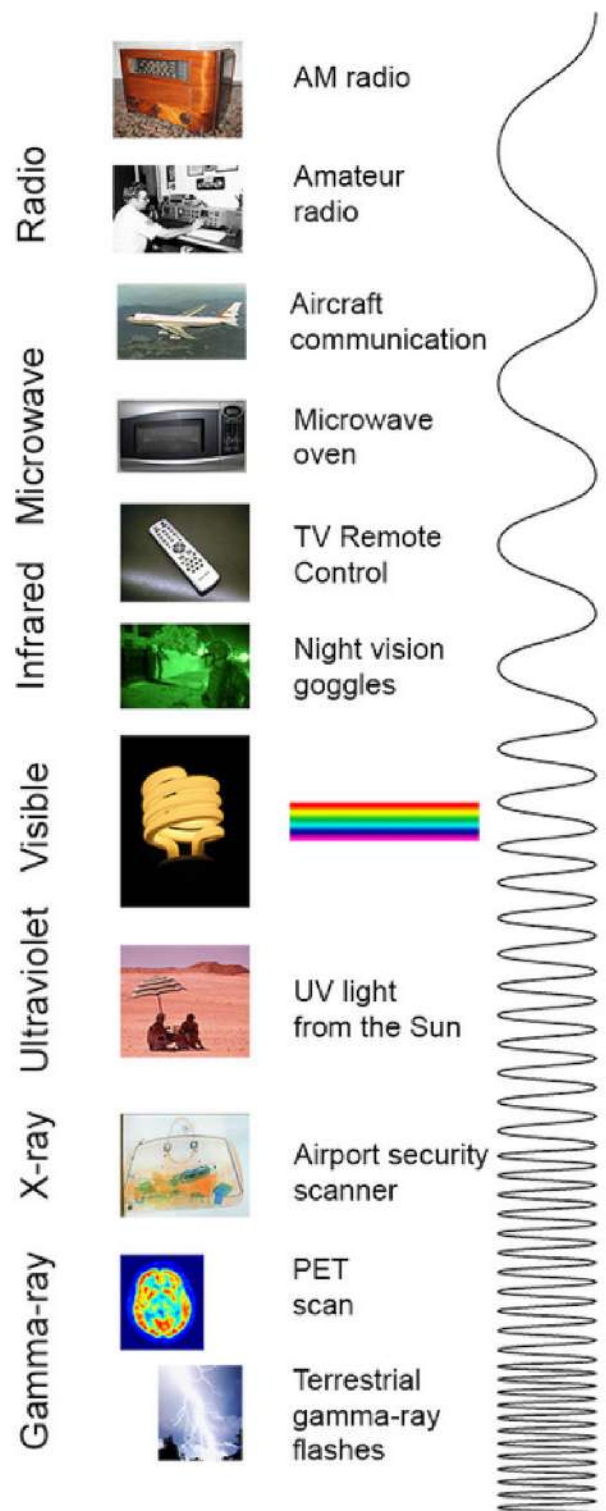
[7] The health criteria documents issued by INIRC covers the electromagnetic fields in the frequency range from 100 kHz to 300 GHz and contains scientific details on physical characteristics, measurements and instrumentation, sources and applications of non-ionising electromagnetic radiation.

EMI shielding refers to the reflection and/or absorption of EM radiations using a material. The material acting as a shielding material prevents the penetration of radiations of high frequencies such as radio waves.

Electric fields can be shielded by nearly any conductive material; a thin sheet of aluminium is often used in electronics to achieve robust shielding. Metal mesh (like chicken wire), metallized cloth, and some carbon- or metal-filled plastics can also provide varied levels of protection from electric fields.

Although an invisible enemy, electromagnetic radiation is a common and rapidly growing environmental problem. Today, no matter where you are, you are exposed to varying degrees of radiation,

and the levels will continue to rise as technology advances. Therefore, in order to combat this phenomenon, it is essential to understand the concept of electromagnetic pollution as well as possible and to apply the necessary measures.



THE ELECTROMAGNETIC SPECTRUM FROM LOWEST ENERGY/LONGEST WAVELENGTH (AT THE TOP) TO HIGHEST ENERGY/SHORTEST WAVELENGTH (AT THE BOTTOM). (CREDIT: NASA'S IMAGINE THE UNIVERSE)



UNDERSTANDING HUMAN BEHAVIOR IN THE WAKE OF TAIWAN'S 7.3 MAGNITUDE EARTHQUAKE: EXPLORING THE ROLE OF CLIMATE CHANGE

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On the 3rd of April 2024, Taiwan was shaken by a powerful 7.3 magnitude earthquake, leaving behind a trail of devastation and raising questions about human behavior in response to such natural disasters. As scientists continue to delve into the complexities of seismic activity and its relation to climate change, it becomes imperative to explore how human behavior intersects with these phenomena.

The Taiwan Earthquake: A Catastrophic Event

The earthquake that struck Taiwan was not merely a geological event but a socio-economic calamity with profound implications for human behavior. The tremors caused widespread destruction, claiming lives, displacing communities, and disrupting essential services. In the aftermath, people exhibited a range of reactions, from panic and confusion to resilience and solidarity. Understanding these responses necessitates a multi-faceted analysis that considers psychological, cultural, and environmental factors.

Psychological Responses to Natural Disasters

Human behavior in the face of natural disasters is often shaped by psychological mechanisms triggered by fear, uncertainty, and trauma. The sudden onset of an earthquake can induce panic and chaos as individuals grapple with the immediate threat to their safety and well-being. Psychologists have identified various coping mechanisms, including denial, avoidance, and seeking social support, as people attempt to regain a sense of control amidst the chaos. Furthermore, the psychological impact of prolonged exposure to natural disasters cannot be understated. Survivors may experience post-traumatic stress disorder (PTSD), anxiety, and depression, exacerbating existing mental health challenges. Addressing these psychological repercussions requires a comprehensive approach that prioritizes access to mental health services, community support networks, and trauma-informed interventions.

Cultural Influences on Disaster Response

Cultural norms and values play a significant role in shaping human behavior during times of crisis. In Taiwan, a culture characterized by collectivism and social cohesion often translates into swift and coordinated responses to emergencies. The concept of "renhe gongtongti" or "people's collective strength" underscores the importance of community solidarity in overcoming adversity.

Moreover, traditional beliefs and rituals may offer solace and guidance to individuals grappling with the aftermath of a natural disaster. Practices such as ancestor veneration, prayer ceremonies, and communal gatherings serve not only as coping mechanisms but also as sources of cultural resilience in the face of adversity.

Environmental Context: Climate Change and Seismic Activity

While earthquakes are primarily driven by tectonic forces, emerging research suggests that climate change may influence seismic activity through various indirect mechanisms. Rising global temperatures, melting glaciers, and changes in groundwater levels can exert pressure on Earth's crust, potentially leading to an increase in the frequency and intensity of earthquakes in certain regions.

In the case of Taiwan, a seismically active island situated along the Pacific Ring of Fire, the interplay between climate change and seismic activity is of particular relevance. The island's mountainous terrain and proximity to tectonic plate boundaries make it susceptible to earthquakes, while factors such as deforestation, urbanization, and infrastructure development can exacerbate vulnerability to natural hazards.

Adapting to a Changing Environment

As communities grapple with the dual challenges of seismic risk and climate change, adaptation and resilience-building emerge as critical imperatives. Investing in early warning systems, retrofitting infrastructure, and implementing land-use planning measures are essential strategies for mitigating the impact of earthquakes.

Furthermore, addressing the root causes of climate change through emissions reduction, sustainable development practices, and ecosystem conservation is paramount in reducing the long-term risk posed by natural disasters. By fostering a holistic approach that integrates scientific knowledge, community engagement, and policy intervention, societies can enhance their capacity to withstand and recover from environmental shocks.

Conclusion

The Taiwan earthquake serves as a sobering reminder of the complex interplay between natural disasters, human behavior, and environmental dynamics. As we strive to understand and mitigate the impact of seismic events, it is imperative to recognize the interconnectedness of social, cultural, and environmental factors shaping our response to crises.

By fostering resilience, promoting community cohesion, and addressing the underlying drivers of climate change, we can build a more sustainable and resilient future for vulnerable communities worldwide. As we confront the challenges posed by a changing climate and a volatile geophysical landscape, solidarity, innovation, and collective action will be our greatest assets in navigating uncertain times.



IMAGE SOURCE:-

[HTTPS://ORGANISER.ORG/2024/04/04/230966/World-Taiwan-Earthquake-2024-Know-Everything-About-The-Ring-of-Fire-Here/](https://organiser.org/2024/04/04/230966/World-Taiwan-Earthquake-2024-Know-Everything-About-The-Ring-of-Fire-Here/)

THE VANISHING ACT: UNDERSTANDING TROPICAL FOREST LOSS AND ITS GLOBAL IMPACT

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Tropical forests, also known as the Earth's lungs, are critical ecosystems that contribute significantly to global environmental equilibrium. These lush green stretches, which span continents such as South America, Africa, and Southeast Asia, not only support an astonishing diversity of flora and fauna, but also act as carbon sinks, regulate climatic patterns, and offer livelihoods for millions of people. However, in recent decades, the alarming rate of tropical forest loss has become a major issue, endangering biodiversity, climate stability, and human well-being.

Causes of Tropical Forest Loss:

The causes of tropical forest decline are several and intricate, frequently linked with social, economical, political, and environmental variables. One of the key causes of deforestation is agricultural expansion, which is driven by consumer demand for commodities such as palm oil, soybeans, cattle ranching, and lumber. Large-scale industrial agriculture, which often involves clear-cutting and forest fires, has resulted in widespread destruction of habitat and fragmentation.

Furthermore, infrastructural development, such as road construction, mining, and hydroelectric projects, encroaches on pristine forest areas, increasing deforestation. Illegal logging, fueled by rich wood markets, also contributes to the degradation of tropical forests, compromising conservation efforts and compounding environmental damage.

Additionally, population increase and simultaneous land-use demands, combined with ineffective land governance and lax law enforcement, provide ideal ground for unsustainable land exploitation practices, hastening tropical forest decline.

Consequences of Tropical Forest Loss:

The impacts of tropical forest loss have consequences locally, regionally, and worldwide, affecting biodiversity, the climate, and human societies. One of the most urgent implications is the loss of habitat for several plant and animal species, resulting in biodiversity loss and potential extinction crises. Tropical forests are home to an estimated 50% to 90% of the world's terrestrial species, hence their extinction poses a huge threat to global biodiversity.

Moreover, deforestation disturbs critical ecosystem services including water management, soil fertility, and carbon sequestration, causing negative effects on local climates. It also increases the chances and intensity of extreme weather conditions like droughts and floods. Tropical forests act as carbon sinks, absorbing and storing CO₂ from the atmosphere to help mitigate climate change. Nevertheless, deforestation releases massive amounts of stored carbon back into the atmosphere, increasing greenhouse gas emissions and aggravating global warming.

In addition, tropical forest loss has far-reaching socioeconomic consequences, particularly for indigenous and local populations that rely on forests for their livelihoods and cultural identity. Displacement, loss of traditional knowledge, and conflicts over land and resources are common outcomes of deforestation, worsening socioeconomic disparities and reducing community resilience.

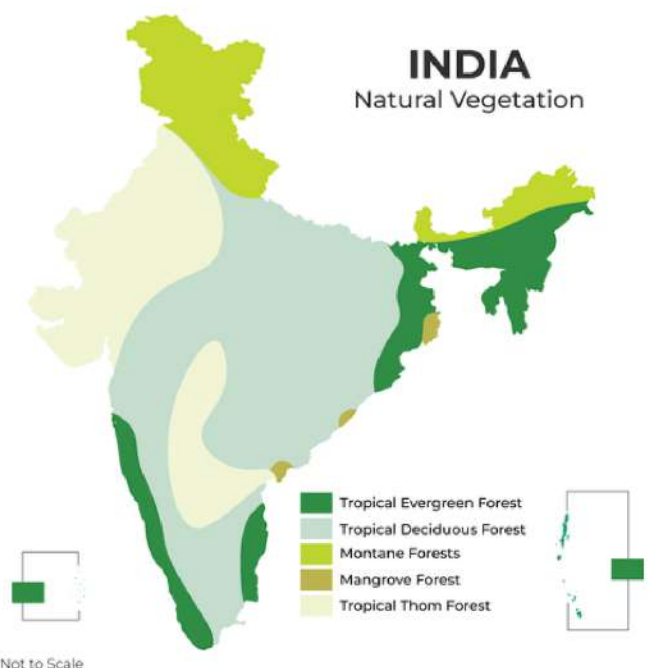
Addressing Tropical Forest Loss:

Addressing tropical forest loss necessitates a multifaceted strategy that combines conservation, sustainable land management, and socioeconomic development objectives. Strengthening land governance and law enforcement systems is critical for combating illegal deforestation and promoting sustainable land use. Policies that reward responsible forest management, such as payments for ecosystem services and certification systems, can promote sustainable forestry practices while also helping local communities.

Promoting alternative livelihood choices, such as agroforestry, eco-tourism, and community-based conservation programs, can provide financial incentives for forest conservation while also empowering local populations to manage their natural resources sustainably. Investing in reforestation and afforestation projects, together with restoration efforts, can help restore degraded forest landscapes and increase ecosystem resilience.

In addition, international cooperation and partnerships are essential for tackling the transboundary nature of tropical forest degradation and establishing sustainable development routes. Initiatives like REDD+ (Reducing Emissions from Deforestation and Forest Degradation), which seeks to incentivize forest conservation and sustainable management in developing nations, show the potential for global cooperation in tackling deforestation and climate change.

Tropical forests are vital ecosystems that provide several environmental, economic, and cultural advantages to humanity. However, the alarming decline of tropical forests poses a serious threat to biodiversity, climate stability, and human well-being. Addressing this complicated dilemma requires coordinated actions at the local, national, and international levels, driven by values of sustainability, fairness, and environmental stewardship. By prioritizing forest conservation, promoting sustainable land management practices, and empowering local communities, we can work towards safeguarding these irreplaceable natural treasures for present and future generations.



SOURCE:-[HTTPS://WWW.GEEKSFORGEESKS.ORG/TROPICAL-EVERGREEN-FORESTS-IN-INDIA/](https://www.geeksforgEEKS.org/TROPICAL-EVERGREEN-FORESTS-IN-INDIA/)



UNRAVELING THE COMPLEXITIES OF EARTHQUAKE PHYSICS: A COMPREHENSIVE EXPLORATION

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Abstract:

Earthquakes, among the most destructive natural phenomena, have intrigued scientists and fascinated humanity for centuries. These seismic events, characterized by sudden and violent shaking of the Earth's surface, result from the release of accumulated stress within the Earth's crust. At the heart of earthquake occurrences lies the intricate physics governing the movement of tectonic plates, the formation of faults, the concept of elastic rebound, and the propagation of seismic waves. This comprehensive exploration aims to delve deep into the complexities of earthquake physics, elucidating the fundamental principles and mechanisms underlying these seismic events. By unraveling the mysteries of earthquake physics, we can enhance our understanding of seismic hazards, improve earthquake prediction, and develop strategies for mitigating risks, thereby safeguarding lives and property in earthquake-prone regions.

Introduction

Earthquakes represent one of the most significant geological hazards, posing threats to human lives, infrastructure, and socio-economic stability. The study of earthquakes encompasses various scientific disciplines, including geophysics, seismology, geology, and engineering. At the core of earthquake research lies the understanding of earthquake physics, which involves unraveling the processes governing the generation, propagation, and effects of seismic waves. This comprehensive exploration seeks to provide a thorough understanding of earthquake physics, beginning with the fundamental principles of plate tectonics and faulting, followed by an examination of elastic rebound theory and seismic wave propagation. Through this interdisciplinary approach, we aim to elucidate the complexities of earthquake phenomena and their implications for society.

Plate Tectonics and Tectonic Plate Boundaries

The Earth's lithosphere is composed of several rigid tectonic plates that float atop the semi-fluid asthenosphere beneath them. These plates are in constant motion due to the convective currents within the Earth's mantle, a process known as plate tectonics. The movement of tectonic plates is driven by forces such as mantle convection, ridge push, and slab pull. Plate boundaries, where tectonic plates interact, are classified into three main types: divergent boundaries, where plates move apart; convergent boundaries, where plates collide; and transform boundaries, where plates slide past each other horizontally. The dynamics of plate tectonics play a crucial role in the generation and distribution of earthquakes worldwide.

Faulting and Fault Mechanics

Faults are fractures or zones of weakness in the Earth's crust along which movement occurs. The movement along faults is primarily governed by the stress regime and the mechanical properties of rocks. Faults are classified based on the direction of movement: strike-slip faults, where the movement is predominantly horizontal; normal faults, where the movement is vertical and extensional; and reverse/thrust faults, where the movement is vertical and compressional. The mechanics of faulting involve the accumulation of stress along fault planes, followed by the sudden release of energy through fault rupture. Understanding fault mechanics is essential for assessing seismic hazards and predicting earthquake occurrences.

Elastic Rebound Theory

The concept of elastic rebound theory, proposed by Harry Fielding Reid in 1910, provides insights into the mechanisms underlying earthquake generation. According to this theory, rocks on either side of a fault deform elastically in response to stress until the stress exceeds the strength of the rocks, causing them to fracture and rebound to a less stressed state. This sudden release of stored elastic energy generates seismic waves,

leading to ground shaking and other earthquake effects. Elastic rebound theory explains the cyclical nature of earthquakes and the concept of seismic cycles, wherein stress accumulates along faults over time, leading to periodic seismic events.

Seismic Waves and Wave Propagation

Seismic waves are the energy waves that propagate through the Earth during an earthquake, carrying information about the earthquake source and the Earth's internal structure. There are three primary types of seismic waves: primary (P) waves, secondary (S) waves, and surface waves. P waves are compressional waves that travel fastest through solids, liquids, and gases, causing particles to move parallel to the direction of wave propagation. S waves are shear waves that propagate only through solids, causing particles to move perpendicular to the direction of wave propagation. Surface waves travel along the Earth's surface and are responsible for most of the damage caused by earthquakes due to their larger amplitudes and longer duration. The propagation of seismic waves is influenced by the Earth's material properties, including density, elasticity, and viscosity, as well as the geometry and focal mechanism of the earthquake source.

Seismology: The Study of Earthquakes

Seismology is the scientific study of earthquakes and seismic waves, aimed at understanding the Earth's internal structure, earthquake mechanisms, and seismic hazards. Seismologists use instruments called seismographs to detect and record seismic waves, enabling them to analyze various parameters of earthquakes, such as location, depth, magnitude, and focal mechanism. Seismic data collected from networks of seismographic stations worldwide provide valuable insights into earthquake occurrences and their implications for society. Advances in seismological techniques, including seismic tomography, waveform modeling, and earthquake early warning systems, have revolutionized our understanding of earthquake processes and improved our ability to mitigate seismic risks.

Implications for Society

The understanding of earthquake physics has significant implications for society, particularly in earthquake-prone regions. By comprehending the processes driving earthquakes, scientists and engineers can develop better strategies for earthquake prediction, early warning systems, and earthquake-resistant infrastructure. Improved building codes and construction practices can help minimize the loss of life and property during earthquakes, contributing to societal resilience and disaster preparedness. Additionally, public education and awareness initiatives play a crucial role in fostering earthquake preparedness and fostering community resilience in the face of seismic hazards.

Conclusion

In conclusion, the study of earthquake physics encompasses a multidisciplinary approach, involving geophysics, seismology, geology, and engineering. By unraveling the complexities of plate tectonics, faulting, elastic rebound, and seismic wave propagation, scientists strive to enhance our understanding of earthquake processes and their implications for society. Through advancements in seismological techniques, earthquake early warning systems, and earthquake-resistant infrastructure, we can mitigate the risks posed by earthquakes and safeguard lives and property in earthquake-prone regions. Continued research and collaboration in the field of earthquake physics are essential for improving our ability to predict, mitigate, and respond to seismic events, ultimately enhancing societal resilience and disaster preparedness on a global scale.

Earthquake Magnitude Classes

8.0 or larger: Great
Significant damage expected

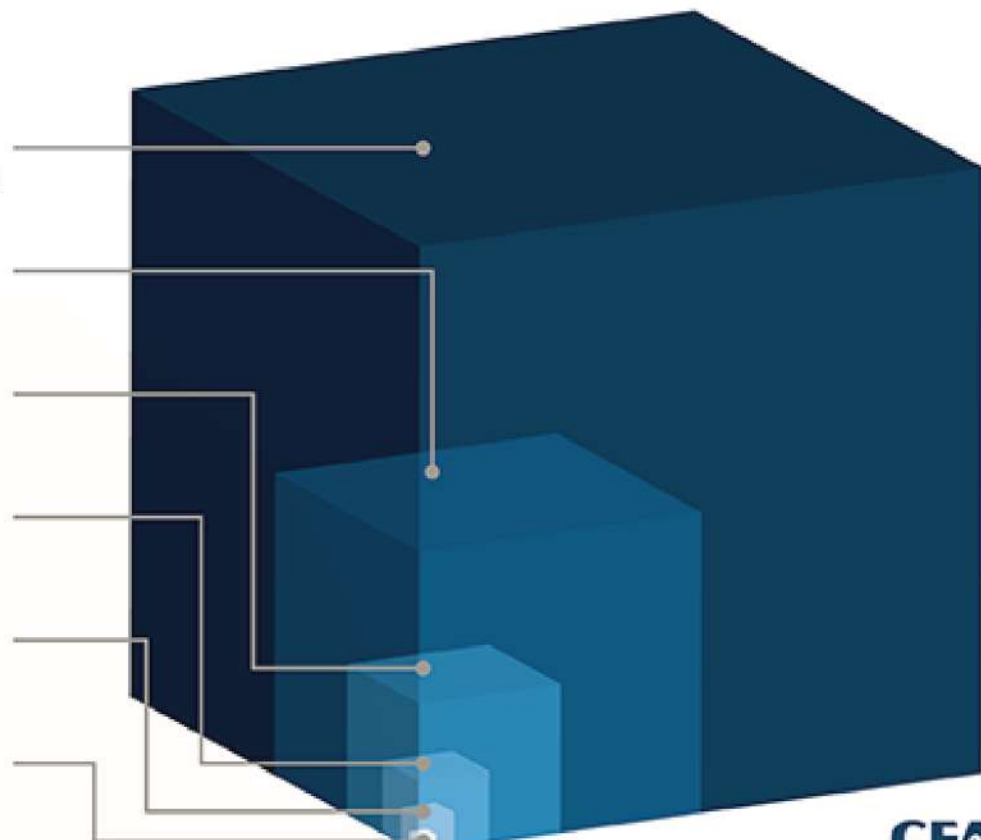
7.0 - 7.9: Major
Damage expected

6.0 - 6.9: Strong
Damage may occur

5.0 - 5.9: Moderate
Minor damage may occur

4.0 - 4.9: Light
Likely felt

3.0 - 3.9: Minor
May be felt



CEA CALIFORNIA EARTHQUAKE AUTHORITY™

MOVIE RECOMMENDATION

ARMAGEDDON

- **Director**
 - Michael Bay
- **Writers**
 - Jonathan Hensleigh
 - J.J. Abrams
 - Tony Gilroy
- **Stars**
 - Bruce Willis
 - Billy Bob Thornton
 - Ben Affleck



Summary

"Armageddon" is a gripping sci-fi disaster film directed by Michael Bay that takes audiences on a rollercoaster ride of action, emotion, and suspense. The story revolves around an impending catastrophe: a colossal asteroid is hurtling towards Earth, threatening to wipe out all life on the planet. In a desperate bid to save humanity, NASA devises a daring plan to destroy the asteroid before it's too late.

Leading the charge is Harry Stamper, played by Bruce Willis, a rugged and experienced oil driller with a no-nonsense attitude. Alongside his team of skilled roughnecks, Harry is tasked with a seemingly impossible mission: to drill into the asteroid's core and plant a nuclear bomb to obliterate it from within.

As tensions escalate and the clock ticks down, Harry and his crew undergo rigorous training to become astronauts, facing physical and mental challenges unlike anything they've ever encountered. Amidst the chaos, personal relationships are tested, particularly Harry's strained bond with his daughter Grace, portrayed by Liv Tyler, who harbors resentment towards her father for his absenteeism.

As the crew embarks on their perilous journey aboard the spacecraft "Freedom," they encounter a series of harrowing obstacles and setbacks. From malfunctioning equipment to unexpected asteroid debris, every moment is fraught with danger and uncertainty. Yet, fueled by determination and camaraderie, they press on, knowing that failure is not an option.

"Armageddon" delves into themes of sacrifice, bravery, and the resilience of the human spirit. Each member of the crew must confront their fears and inner demons, finding strength in unity and the unwavering belief that their actions can make a difference.

With breathtaking special effects and adrenaline-pumping action sequences, "Armageddon" delivers an unforgettable cinematic experience that keeps audiences on the edge of their seats until the very end. It's a thrilling ride filled with heart-stopping moments, poignant character arcs, and a powerful message about the indomitable nature of the human will in the face of overwhelming odds.

"Guardians of the Greenwood"

In the heart of the woodland green,
Where mighty trees in silence lean,
There lies a tale of utmost worth,
Of guardianship o'er the Earth.

In whispers soft, the leaves do sing,
Of harmony in everything,
The birds, the beasts, the streams that flow,
In nature's dance, they all bestow.

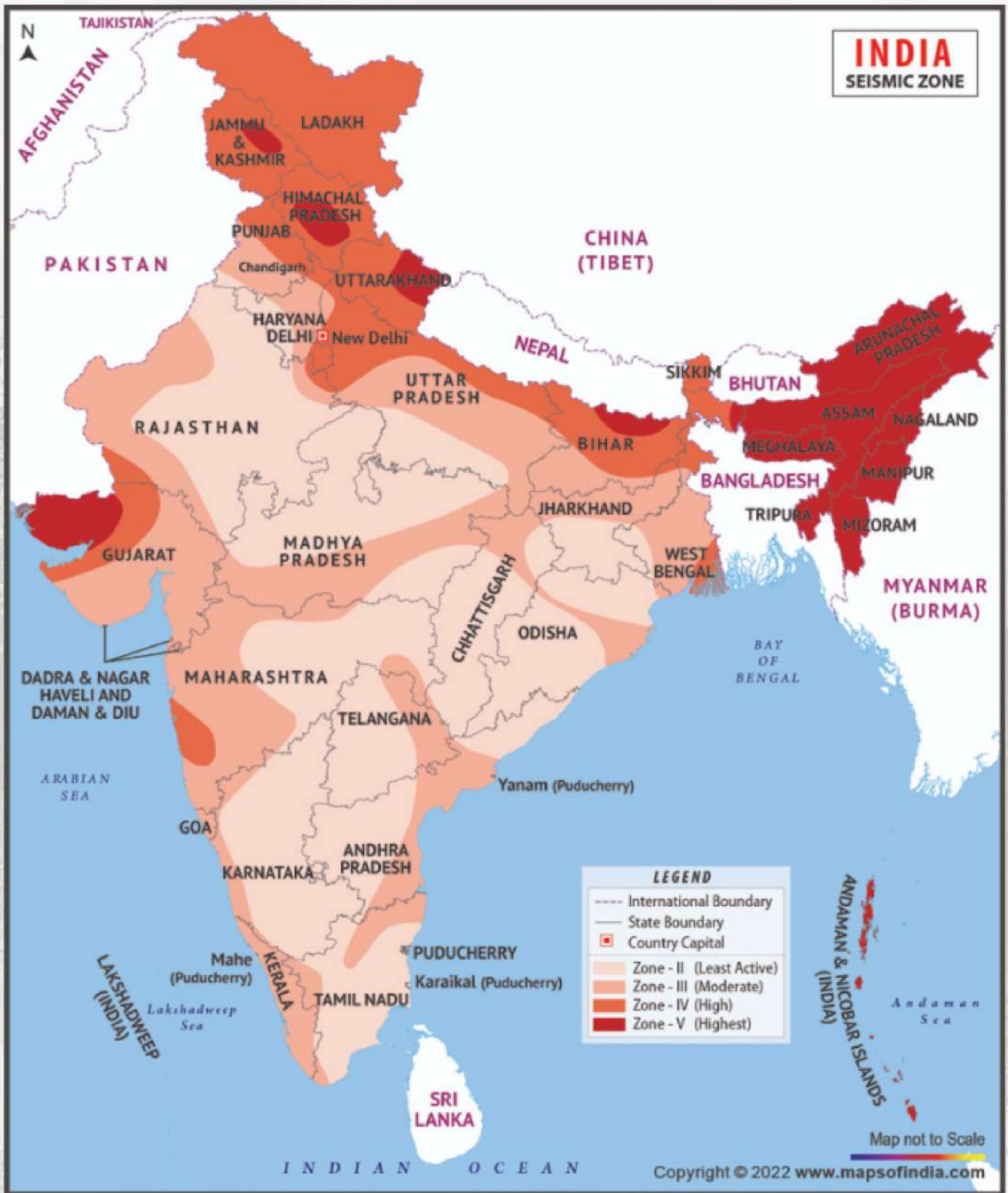
Yet shadows cast by human hand,
Threaten to scar this sacred land,
For greed and folly blind the eye,
To forests that beneath them lie.

But hark! A call from ancient trees,
A plea carried on gentle breeze,
For those who'd hear and heed the call,
To rise and stand, to break the fall.

For in the depths of forest deep,
A promise made, a vow to keep,
To nurture, cherish, and defend,
These emerald realms till time's own end.

So let us join in noble quest,
To guard the forest's verdant vest,
With reverence for each living form,
In nature's tapestry reborn.

For in the heart of woodland green,
Lies hope eternal, ever keen,
That through our care and preservation,
Shall flourish life in jubilation.



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