EARTH QUAKE RISK ANALYSIS

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OUR WORLD IS AT RISK

- Floods
- Severe Windstorms
- Earthquakes
- Tsunamis
- Droughts
- Volcanic Eruptions
- Landslides
- Wildfires
ANNUAL FREQUENCY

- 100,000 THUNDERSTORMS
- 10,000 FLOODS
- THOUSANDS OF MODERATE TO LARGE-VOLUME LANDSLIDES
- THOUSANDS OF WILDFIRES
- 100 DAMAGING SIZE EARTHQUAKES
- SCORES TO HUNDREDS OF SEVERE WINDSTORMS
- ABOUT TEN VOLCANIC ERUPTIONS, TSUNAMIS, AND DROUGHTS
EVERY COMMUNITY IS AT RISK FROM NATURAL HAZARDS, WHICH CREATES AN URGENT NEED FOR PUBLIC POLICIES AND STRATEGIC PLANS TO PREVENT, MITIGATE, AND PREPARE FOR THE INEVITABLE
COMMUNITY DATA BASES AND INFORMATION

HAZARDS:
- Ground Shaking
- Ground Failure
- Surface Faulting
- Tectonic Deformation
- Tsunami Run Up
- Aftershocks

RISK ASSESSMENT
- Hazard Maps
- Inventory
- Vulnerability
- Location

RISK
- Acceptable Risk
- Unacceptable Risk

DISASTER RISK REDUCTION

POLICY OPTIONS
- Prevention-Mitigation
- Preparedness
- Emergency Response
- Recovery
- Adaptation
A DISASTER IMPACTS ALL SOCIETAL ELEMENTS

NATURAL DISASTER REDUCTION

- Loss of tax base
- Injuries
- Deaths
- Homeless
- Loss of function
- Jobless
- Damage
INSTITUTIONALIZATION OF DISASTER REDUCTION

GOAL: TO FIND THE COMMON AGENDA (CA) OF TECHNICAL AND POLITICAL SOLUTIONS
COMMON AGENDA FOR DISASTER RESILIENCE

- **PREVENTION**
  (CONTROL THE SOURCE)

- **PROTECTION**
  (BUILD TO WITHSTAND)

- **LAND-USE CONTROL**
  (AVOIDANCE)
COMMON AGENDA FOR DISASTER RESILIENCE

NATURAL DISASTER REDUCTION
GOAL OF A COMMUNITY:

- SITE MODIFICATION
- ALERT/WARNING/MAPS/MONITORING
- RESPONSE TO ALERT/WARNING/MAPS/MONITORING TO MOVE PEOPLE OUT OF HARM’S WAY

CAPABILITIES OF COMMUNITY TO COPE WITH DEMANDS

DEMANDS OF NATURAL HAZARD ON THE COMMUNITY
MEDITERRANEAN REGION’S HAZARDS

- EARTHQUAKES
- FLOODS
- DROUGHTS
- LANDSLIDES
- TSUNAMIS
- VOLCANIC ERUPTIONS
- ENVIRONMENTAL DEGRADATION
SUB-SAHARA AFRICA’S PROBLEMS AND HAZARDS

- POLITICAL INSTABILITY
- FLOODS
- DROUGHTS
- ENVIRONMENTAL IMPACTS ON AIR, WATER, AND SOIL
- ENDANGERED SPECIES
- HEALTH CONCERNS
EUROPE’S HAZARDS

- FLOODS
- GLOBAL CHANGE
- SEVERE WINDSTORMS
- EARTHQUAKES
- ENVIRONMENTAL DEGRADATION
LATIN AMERICA/CARIBBEAN BASIN’S HAZARDS

- HURRICANES
- EARTHQUAKES/TSA-NAMIS
- FLOODS
- GLOBAL CHANGE
- LANDSLIDES
- VOLCANIC ERUPTIONS
- ENVIRONMENTAL IMPACTS
SOUTH AMERICA/CARIBBEAN BASIN’S HAZARDS

- Hurricanes
- Earthquakes/Tsunamis
- Floods
- Global Change
- Landslides
- Volcanic Eruptions
- Environmental Impacts
PACIFIC REGION’S HAZARDS

- SEVERE WINDSTORMS
- FLOODS
- EARTHQUAKES/TSUNAMIS
- WILDFIRES
ASIA’S HAZARDS

- FLOODS
- EARTHQUAKES
- TSUNAMIS
- CYCLONES/TYPHOONS
- VOLCANIC ERUPTIONS
- LANDSLIDES
- DROUGHTS
- ENVIRONMENTAL DEGRADATION
INDIAN OCEAN AREA’S HAZARDS

- Floods
- Earthquakes
- Tsunamis
- Cyclones/Typhoons
- Volcanic Eruptions
- Landslides
- Droughts
- Environmental Degradation
INDIAN OCEAN TSUNAMI: 26 DECEMBER 2004

Quake Waves Hit African Coast

Map showing the Indian Ocean and the African coastline with countries such as Somalia, Kenya, Tanzania, Seychelles, Madagascar, Mauritius, Sri Lanka, and Sumatra.
NORTH AMERICA’S HAZARDS

- Floods
- Hurricanes
- Earthquakes
- Tornadoes
- Ice Storms
- Volcanic Eruptions
- Landslides
EASTERN NORTH AMERICA’S HAZARDS

- Floods
- Hurricanes
- Earthquakes
- Tornadoes
- Ice Storms
- Landslides
FLOODS

CASE HISTORIES

BUILDING IN FLOOD PLAIN

INUNDATION AND SCOUR

INTERACTION WITH HAZARDOUS MATERIALS

EFFECTS OF WATER ON STRUCTURE & CONTENTS

INCREASED POTENTIAL FOR HEALTH PROBLEMS, INJURIES, AND DEATH

LOSS OF FUNCTION OF CRITICAL INFRASTRUCTURE

VULNERABILITY OF NON-STRUCTURAL ELEMENTS

CAUSES OF RISK
WIND AND WATER PENETRATE BUILDING ENVELOPE

UPLIFT OF ROOF SYSTEM

FLYING DEBRIS PENETRATES WINDOWS

STORM SURGE AND HEAVY PRECIPITATION

IRREGULARITIES IN ELEVATION AND PLAN

POOR WORKMANSHIP

IGNORING NON-STRUCTURAL ELEMENTS

SEVERE WINDSTORMS

CASE HISTORIES

CAUSES OF RISK
INADEQUATE RESISTANCE TO HORIZONTAL GROUND SHAKING

SOIL AMPLIFICATION

PERMANENT DISPLACEMENT (SOIL FAILURE AND SURFACE FAULTING)

IRREGULARITIES IN MASS, STRENGTH, AND STIFFNESS

FLOODING FROM TSUNAMI WAVE RUNUP AND SEICHE

POOR DETAILING OF STRUCTURAL SYSTEM

IGNORING NON-STRUCTURAL ELEMENTS

CAUSES OF RISK

EARTHQUAKES

CASE HISTORIES
CAUSES OF RISK

- HIGH VELOCITY IMPACT OF INCOMING WAVES
- INLAND DISTANCE OF WAVE RUNUP
- VERTICAL HEIGHT OF WAVE RUNUP
- INADEQUATE RESISTANCE OF BUILDINGS
- FLOODING
- NO WARNING, OR INADEQUATE WARNING
- PROXIMITY TO SOURCE OF TSUNAMI

TSUNAMIS

CASE HISTORIES
PROXIMITY TO LATERAL BLAST

IN PATH OF PYROCLASTIC FLOWS

IN PATH OF FLYING DEBRIS (TEPHRA)

IN PATH OF VOLCANIC ASH (AVIATION)

IN PATH OF LAVA FLOWS

IN PATH OF LAHARS

IGNORING WARNING TO EVACUATE
BUILDING ON UNSTABLE SLOPES

SOIL AND ROCK SUSCEPTIBLE TO FALLS

SOIL AND ROCK SUSCEPTIBLE TO TOPPLES

SOIL AND ROCK SUSCEPTIBLE TO SPREADS

SOIL AND ROCK SUSCEPTIBLE TO FLOWS

EXCESSIVE PRECIPITATION OR GROUND SHAKING

BARE, OVERSTEEPENED SLOPES

CAUSES OF RISK

LANDSLIDES

CASE HISTORIES
PROLONGED LACK OF PRECIPITATION

LOSS OF SOIL MOISTURE

LOSS OF AGRICULTURAL PRODUCTIVITY

DEPLETION/POLLUTION OF GROUND WATER

LOSS OF VEGETATION

INSECT INFESTATION

PROGRESSIVE LOSS OF LAND BY DESERTIFICATION

CAUSES OF RISK

DROUGHTS

CASE HISTORIES
CAUSES OF RISK

- Lightning Strikes
- Manmade Fires
- Proximity of Urban-Wildlands Interface
- Wind Direction and Speed
- Deforestation
- Denuded Slopes
- Hot, Dry Weather

Wildfires
Case Histories
Disasters in India

- Moving away from the Great Bengal famine of 1769-1770 in which a third of the population perished.
- The Chalisa famine of 1783, the Doji Bara or Skull famine of 1790 to 1792, the North West Provinces famine of 1838, the North West India Famine of 1861, the Bengal and Orissa famine of 1866, the Rajputana famine of 1869, the famine of 1899 to 1901, the Bengal famine of 1943...
India’s Vulnerability to Disasters

- 57% land is vulnerable to earthquakes. Of these, 12% is vulnerable to severe earthquakes.
- 68% land is vulnerable to drought.
- 12% land is vulnerable to floods.
- 8% land is vulnerable to cyclones.
- Apart from natural disasters, some cities in India are also vulnerable to chemical and industrial disasters and man-made disasters.
Seismic Activity in India
180 AD - 2004
Earthquake Zones of India indicating 60 cities with population exceeding half a million.
Distribution of epicenters of earthquakes greater than magnitude 5.0 for the period 1976-2000, South East Asia and Indian Ocean
DESIGN PRINCIPLES OF CONSTRUCTION IN DISASTER PRONE AREAS
DISASTER

A serious disruption in the functioning of the community or a society causing wide spread material, economic, social or environmental losses which exceed the ability of the affected society to cope using its own resources.

A disaster is a result from the combination of hazard, vulnerability and insufficient capacity or measure to reduce the potential chances of risk.

A disaster happens when a hazard impacts on the vulnerable population and causes damage.
**Vulnerability**

**Underlying Causes**
- Limited access to resources
- Illness and disabilities
- Age/sex
- Poverty
- ......................

**Dynamic Pressure**
- Lack of
  - institutions
  - education
  - training
  - skills
- Population expansion
- Urbanization
- Uncontrolled development
- Environmental degradation
- ......................

**Unsafe Conditions**
- Dangerous location
- Dangerous buildings
- Low income level
- ......................

**Hazard**

**Trigger event**
- Earthquake
- Tsunamis
- Floods
- Cyclones
- Volcanic eruption
- Drought
- Landslide
- War
- Technological accident
- Environmental pollution
- ......................
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<tr>
<th>Sl. No</th>
<th>Disaster</th>
<th>Impact</th>
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<tr>
<td>1</td>
<td>Cyclone</td>
<td>29th October 1971, Orissa</td>
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<td>Cyclone</td>
<td>19th November, 1977, Andhra Pradesh</td>
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<td>29th and 30th October 1999, Orissa</td>
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<td>Earthquake</td>
<td>20th October 1991 Uttarkashi</td>
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<td>30th September 1993 Latur</td>
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<td>Earthquake</td>
<td>22 May 1997 Jabalpur</td>
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<td>29th March 1997, Chamoli</td>
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<td>August 1993, Nagaland</td>
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<td>Landslide</td>
<td>18th August 1998, Malpa</td>
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<td>Flood</td>
<td>1978 Floods in North East India</td>
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<td>S. No.</td>
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<td>13-17 Nov 2008</td>
<td>Cyclonic Storm (Khaimuk)</td>
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<td>10-16 May 2013</td>
<td>Cyclonic Storm (Mahasen)</td>
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<td>Very Severe Cyclonic Storm (Phailin)</td>
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<td>17-22 May 2016</td>
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<td>21-28 October 2016</td>
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<tr>
<td>54</td>
<td>08-12 Oct 2018</td>
<td>Very Severe Cyclonic Storm TITLI</td>
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DISASTER MANAGEMENT

DISRUPTION
INDUCED
SITUATION
AFTER
SEVERE
TRANSFORMATION OF
ECOLOGICAL
RESPONSE
WHAT IS DISASTER

DISASTER- French word, (Des-bad & Astre -star)
W.Nick carter defined:
“An Event, Natural/ Manmade, Sudden/Progressive, which impacts with such severity that the community has to respond taking exceptional Measures.”

2. It is a phenomenon involving extensive ecological disruption leading risk to life, property and health to an extent warranting extra ordinary response from outside the affected area.
MAJOR DISASTERS IN INDIA

- Highly disaster prone country
- 8 natural calamities /yr
- 5 fold increase in the frequency of disasters during last 30 yrs.
- Bhopal gas tragedy.
- Cyclones (AP)& Orissa.
- Train accidents.
- Bomb blasts in Delhi and Mumbai
TYPES OF DISASTER

DISASTER

NATURAL
- Flood
- Cyclone
- Earthquake
- Volcanic eruption
- Epidemics
- Tsunami

MAN-MADE
- Air crash
- Sinking ship
- Train accidents
- Building collapse
- Bridge collapse
- Bomb blasts
- Warfare (conventional, chem. bio, nuclear)
<table>
<thead>
<tr>
<th>Types</th>
<th>Hazards</th>
</tr>
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</table>
| Geological Hazards                     | 1. Earthquake  
2. Tsunami  
3. Volcanic eruption | 4. Landslide  
5. Dam burst  
6. Mine Fire |
| Water & Climatic Hazards               | 1. Tropical Cyclone  
2. Tornado and Hurricane  
3. Floods  
4. Drought  
5. Hailstorm | 6. Cloudburst  
7. Landslide  
8. Heat & Cold wave  
9. Snow Avalanche  
10. Sea erosion |
| Environmental Hazards                  | 1. Environmental pollutions  
2. Deforestation  
1. Human / Animal Epidemics  
2. Pest attacks | 3. Desertification  
4. Pest Infection  
3. Food poisoning  
4. Weapons of Mass Destruction |
| Biological                              |                                                |
| Chemical, Industrial and Nuclear Accidents | 1. Chemical disasters  
2. Industrial disasters | 3. Oil spills/Fires  
4. Nuclear |
| Accident related                       | 1. Boat / Road / Train accidents / air crash  
Rural / Urban fires  
Bomb /serial bomb blasts  
2. Forest fires | 3. Building collapse  
4. Electric Accidents  
5. Festival related disasters  
6. Mine flooding |
India is vulnerable in varying degrees to a large number of natural as well as man-made disasters— 58.6 per cent of the landmass is prone to earthquakes of moderate to very high intensity; over 40 million hectares (12 per cent of land) is prone to floods and river erosion; of the 7,516 km long coastline, close to 5,700 km is prone to cyclones and tsunamis; 68 per cent of the cultivable area is vulnerable to drought and hilly areas are at risk from landslides and avalanches. Further, the vulnerability to Nuclear, Biological and Chemical (NBC) disasters and terrorism has also increased manifold.
What on earth do you know about water?

· Approximately 80 per cent of earth’s surface is covered with water but only 1% of it is fresh water that we can use.

· About 2.7 per cent of the total water available on the earth is fresh water of which about 75.2 per cent lies frozen in Polar Regions and another 22.6 per cent is present as ground water.

The rest is available in lakes, rivers, atmosphere, moisture, soil and vegetation. This 1% of water is now threatened by pollution!

· Today, we have approximately the same amount of water as when the Earth was formed. Earth will not get/generate any more water!

· We are using up the fresh water faster than we are recharging our groundwater
Introduction

- Earthquake engineering is a super-specialisation of structural engineering
- Earthquake engineering deals with understanding earthquakes, their causes, their consequences, and designing structures to withstand earthquake forces
- The field of study is highly multi-disciplinary with lead taken by structural engineers
Earthquake is one of the most destructive natural hazard. They may occur at any time of the year, day or night, with sudden impact and little warning. They can destroy buildings and infrastructure in seconds, killing or injuring the inhabitants. Earthquakes not only destroy the entire habitation but may de-stabilize the government, economy and social structure of the country. **But what is an earthquake?** It is the sudden shaking of the earth crust. The impact of an earthquake is sudden and there is hardly any warning, making it **impossible** to predict.
Background

- Earthquakes are one of the most devastating forces in nature
- Earthquakes disasters have been known since ancient times
- Earthquakes have been instrumental in changing the course of history
- Some of the most significant disasters in the last hundred years have been caused by earthquakes
Earthquake Risk

Hazard × Site Effects × Vulnerability

Probability of ground motion

Amplification due to:
- Soil
- Topography

Effect on structures due to:
- Building type and age
- Population density
- Land use
- Month and time

Risk
Probability of damage and losses
Historical Background

- Records of every major earthquake in China during the last 3000 years
- Records of major earthquakes in India up to last 2500 years
- Records of major earthquakes over 2000 years in Middle-East
- Legends about earthquakes in India and several other ancient civilisations
Modern Studies

• Modern study of seismology has been carried out over the last 45-50 years only

• Most useful data has been collected using a world-wide network of seismological stations

• Records show that earthquakes are not uniformly distributed but concentrated along well defined lines
Earthquake Sources
Most earthquakes are concentrated along boundaries of earth’s plates

Some earthquakes also occur away from plate boundaries

Earthquakes in many places are also associated with volcanic activities

In recent times, earthquakes may have been triggered by human structures and activities (dams, mining etc.)
Earth is not a rigid and motionless mass.

Cross-section of the earth can be classified into four distinct concentric layers:

- Inner Core (Solid)
- Outer Core (Liquid)
- Mantle (Liquid)
- Crust (Solid)
Structure of Earth

- Lithosphere (Rigid)
  - 0 to 100 km
- Asthenosphere (Plastic)
  - 100 to 200 km
  - 350 to 500 km
- Mesosphere (Solid)
  - 2900 km
- Outer Core (Liquid)
  - 5150 km
- Inner Core (Solid)

Layers based on physical properties
Plate Tectonics

• Motion of earth’s plates are explained using **Plate Tectonics**

• According to Plate Tectonics:
  - Earth’s land-mass were earlier joined together
  - The land-mass have broken up and have drifted apart
  - Relative motion is still continuing, relative motion at plate boundaries cause earthquakes
Plate Tectonics

150 My Reconstruction
Earth’s Plates
Drift of Indian Subcontinent
Elastic Rebound Theory

(a) Parts of a fault system

Footwall (F)
Hanging wall (H)

Fault plane

Arrows indicate relative motion along the fault plane.

(b) Types of faults

Normal or gravity
Reverse or thrust
Strike-slip
Oblique slip (normal)
Example of Fault Rupture

Chile Earthquake
Example of Fault Rupture

Taiwan Earthquake
Example of Fault Rupture

Kobe Earthquake
Example of Fault Rupture

Kobe Earthquake
Example of Fault Rupture

Kobe Earthquake
Earthquake Waves

- Elastic rebound produces waves from the point of rupture
- The rupture may be localised at a point, along a slip line or a slip surface
- Earthquake waves have clearly identifiable components
  - Primary wave (refractory)
  - Secondary or shear wave (transverse)
  - Raleigh wave (refractory)
  - Love wave (transverse)
Earthquake Magnitude

- Earthquake magnitude is most commonly defined in Richter magnitude
  - It is logarithm of the maximum displacement (in $\mu m$) recorded on a particular type of seismograph 100 km from the epicentre
  - Richter magnitude is open-ended and has no maximum value

- Scientifically more useful measure is based on seismic moment and measures the total energy that is released
  - Both magnitudes give similar value for moderate earthquakes (M 5.0 - M7.5)
Indian Seismicity
Seismic Hazard
Influence of Local Conditions

Maximum ground motion also depends on local soil/rock properties

Maximum ground displacement in Northridge earthquake (1994)
Seismic Vulnerability

- Depends on **type of structures** (structure category) and their age
- Depends on **land use in city** (space between adjacent buildings, height of buildings etc.)
- Depends on **month and time** (buildings may be weaker during the rainy season, and residential buildings more fully occupied during nights)
- Depends on **population density** (impact of damage of a building to number of people)
Urban Construction Practice

Engineered Constructions
- Reinforced concrete buildings
- Brick masonry buildings with RCC roof

Non-Engineered Constructions
- Informal brick masonry buildings
- Other non-engineered buildings using light weight materials
Seismic Vulnerability

- Seismic vulnerability can be expressed in terms of vulnerability curves

![Graph showing vulnerability curves for different materials (Non-engineered Masonry, RCC, Steel).](image-url)
Summary

- Significant knowledge about earthquakes and its consequences exist in scientific community.
- Interest in earthquakes continue since prehistoric times.
- Earthquakes can cause severe damage due to strong ground motions and/or deformations.
- Seismic risk depends on hazard, site conditions and structure vulnerability.
India is divided into 4 seismic zones (low to very high seismic hazard)

Most large cities have moderate to high seismic hazard

The damage at a locality is influenced by the local soil conditions

Building performance depends on ground motions as well as structural characteristics
50 నంది పొందండి మానవు!

- ఆహార పండితుల మాండి మాత్రమే సిద్ధం
- పండితుల పండితుల పండితుల

చర్చలు: దీనిని పండితుల మాండి మాత్రమే సిద్ధం చేసిన చర్చలు తెలుస్తుంది. నాట్య మిసియనరీ పండితుల పండితుల పండితుల పండితుల. పండితుల పండితుల పండితుల పండితుల పండితుల పండితుల. పండితుల పండితుల పండితుల పండితుల పండితుల.

మాయా విభాగం: పండితుల పండితుల పండితుల పండితుల పండితుల పండితుల పండితుల.

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మాయా విభాగం:

చర్చలు: చర్చలు తెలుసు పండితుల పండితుల పండితుల పండితుల పండితుల.

మాయా విభాగం:

చర్చలు: చర్చలు తెలుసు పండితుల పండితుల పండితుల పండితుల.

మాయా విభాగం:

చర్చలు: చర్చలు తెలుసు పండితుల పండితుల పండితుల పండితుల.

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మాయా విభాగం:

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మాయా విభాగం:

చర్చలు: చర్చలు తెలుసు పండితుల పండితుల.
హుమలో మాముడా శిక్షకులు?

Oct 16, 2019, 10:36 IST

- సంస్థలు, అంశిదానికి నిర్ణయాలు
- 158 హుమో 170 విద్యార్థులు, శాస్త్రాంతిక
- ప్రతి బాధ్యత, పద్ధతుల తో ప్రతి సంఘటనలు
విధానం, అధికారం: ఉదాహరణకు ధాన్యమైన శాసనం (ప్రతిమ శాసనం) లాంటి పౌర్ణమి పండ్లి (విద్యాధరమైన) శాసనం ప్రతి సాంస్కృతిక శాసనం లేదా శాసనం అవసరం లేదా ఉపయోగపడింది. ఒక మింటి విద్యాధరమైన శాసనం లేదా పౌర్ణమి శాసనం ద్వారా ప్రతిమ సాంస్కృతిక శాసనం లేదా శాసనం అవసరం లేదా ఉపయోగపడింది. శాసనం ప్రతి ఉదాహరణకు వుండది పౌర్ణమి శాసనం లేదా శాసనం అవసరం లేదా ఉపయోగపడింది. మాత్రమే పౌర్ణమి శాసనం ప్రతిమ సాంస్కృతిక శాసనం లేదా శాసనం అవసరం లేదా ఉపయోగపడింది. అది మింటి విద్యాధరమైన పౌర్ణమి శాసనాం శాసనం ద్వారా ప్రతిమ సాంస్కృతిక శాసనం లేదా శాసనం అవసరం లేదా ఉపయోగపడింది. అది మింటి విద్యాధరమైన పౌర్ణమి శాసనం ప్రతిమ సాంస్కృతిక శాసనం లేదా శాసనం అవసరం లేదా ఉపయోగపడింది. అది మింటి విద్యాధరమైన పౌర్ణమి శాసనం ప్రతిమ సాంస్కృతిక శాసనం లేదా శాసనం అవసరం లేదా ఉపయోగపడింది.
మిగిలిన తీవ్రమైన సమయంలో మాత్రమే కచ్చితంగా ఉంటుంది. మిగిలిన తీవ్రమైన సమయంలో మాత్రమే కచ్చితంగా ఉంటుంది. 

6 మందిగా ఉంటుంది అదీ దానిని నిర్ధిష్టం చేయండి. మాత్రమే కచ్చితంగా ఉంటుంది. మాత్రమే కచ్చితంగా ఉంటుంది.
మీ నమస్కారం..
శివాచారం ముద్ర చేసిన రోధాన్ని రాయించి, అప్పటి కాలానికి నిశ్చయం చేసినంతి కంటే తాత్కాలికం, కాలికా వెంటి నిర్ణయం.. అంటాం.

► మేన్రాం, పిల్లలో సంభాగం అందుకు ప్రత్యేకంగా మామిడి మినిమా నిర్ణయం. 

► మారాం ఉండండి విషయానికి భాగంపై. 

► మాత్రమే విషయానికి భాగంపై. 

► సంప్రదాయ జ్ఞాన కొరకు, మినిమా, మంత్రిత్వ విషయం ప్రతిపాదించండి. 

► సంప్రదాయ జ్ఞాన కొరకు కైలాసం ప్రతిపాదించండి. 

► మాత్రమే నాటికి చేసిన మామిడి మినిమా నిర్ణయం. 

► మేన్రాం పిల్లలో సంభాగం అందుకు ప్రత్యేకంగా మామిడి మినిమా నిర్ణయం.
Thank You