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Manipur Earthquake History and the Cheitharol Kumpapa

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Abstract: ***Manipur, located in the Indo-Burma seismic arc, is among the most earthquake-prone regions of India. While modern instrumental seismology documents earthquakes only from the late 19th century onwards, much earlier evidence is preserved in the Cheitharol Kumpapa, the royal chronicle of Manipur. This chronicle records natural disasters, including several significant earthquakes, such as the great earthquake of 1548 CE and the Cachar–Manipur Earthquake of 1869. By combining historical entries from the chronicle with modern seismological records, this paper reconstructs the earthquake history of Manipur and highlights the value of indigenous documentary sources for seismic hazard studies.***

Keywords: Manipur earthquakes; Cheitharol Kumpapa; historical seismology; Indo-Burma arc; vernacular resilience

1. Introduction

The state of Manipur, situated in the Indo-Burma region of northeast India, is classified in **Seismic Zone V** of the Indian seismic zoning map, denoting very high earthquake risk. The region's tectonic setting, marked by the interaction between the Indian and Burmese plates, produces frequent moderate to strong earthquakes. Although instrumental records began only in the late 19th century, Manipur's **Cheitharol Kumpapa** provides a continuous record of natural phenomena, including earthquakes, from 33 CE onward. This makes it one of the earliest continuous documentary sources for historical seismology in South Asia.

1) Seismicity of Manipur

Manipur falls under Seismic Zone V, the highest seismic zone in India according to the Bureau of Indian Standards (BIS). This classification signifies the region's susceptibility to high-intensity earthquakes. The state has a history marked by numerous earthquakes, including the devastating 1988 earthquake with a magnitude of 7.2.

The primary reasons for Manipur's high seismicity are:

Tectonic Setting: Manipur lies in the Indo-Burmese region, where the Indian plate subducts beneath the Eurasian plate. This ongoing collision and subduction process results in the accumulation of stress along the plate boundary, which is periodically released in the form of earthquakes.

- **Active Faults:** The region is crisscrossed by several active faults, including the Churachandpur-Mao Fault and the Kopili Fault. These faults act as zones of weakness in the Earth's crust, making them prone to rupture and trigger earthquakes.

  Earthquake Vulnerability in Manipur

  While the entire state is susceptible to earthquakes, the level of vulnerability varies across different areas. Factors contributing to this vulnerability include:
- **Building Practices:** Traditional construction practices in Manipur often involve the use of locally available materials like wood and bamboo, which offer some degree of flexibility and resilience to earthquakes. However, rapid urbanization and modernization have led to the construction of concrete buildings, many of which lack proper earthquake-resistant design and construction practices.
- **Population Density:** The Imphal Valley, the most densely populated region of Manipur, is particularly vulnerable. The concentration of buildings and infrastructure in this valley increases the potential for widespread damage and casualties in the event of a major earthquake.
- **Unplanned Urbanization:** Rapid and unplanned urbanization has resulted in the growth of informal settlements and congested areas. These areas are often characterized by narrow streets and poorly constructed buildings, making them highly vulnerable to earthquake damage.

Lack of Awareness: Despite the high seismic risk, awareness about earthquake preparedness and safety measures remains low among the general population. This lack of awareness can exacerbate the impact of an earthquake.

2) The Cheitharol Kumpapa: A Historical Source for Earthquake Study

The **Cheitharol Kumpapa** is the royal chronicle of the kings of Manipur, meticulously maintained over centuries. It provides a continuous historical record from **33 CE to the 20th century**, documenting political events, royal successions, natural phenomena, and social occurrences. Among these, **earthquakes** are particularly valuable for modern seismic research because instrumental records for the region only exist from the 20th century onward.

Importance for Earthquake Studies

a) **Documentation of Seismic Events**

- The chronicle records numerous earthquakes, including major events like the **1548 CE Imphal Valley earthquake** and the **1869 Cachar–Manipur earthquake**.

- Details often include the **year, month, affected areas, and observed damage**, offering insights into earthquake intensity and societal impact.

b) Historical Seismic Intensity Estimation
- Descriptive accounts in the Cheitharol Kumpapa allow researchers to **estimate earthquake magnitude and intensity** using modern scales like the Modified Mercalli Intensity (MMI).
- Example: The 1548 CE earthquake is inferred to be **M6.5–7.0**, based on reports of widespread structural damage and societal disruption.

c) Patterns of Seismicity
- Chronological analysis of earthquakes recorded in the Kumpapa helps identify **recurrence intervals**, active fault zones, and long-term seismic trends in the **Imphal Valley and surrounding regions**.

d) Cultural and Architectural Insights
- The chronicles also provide indirect evidence on the **response of traditional Meitei houses to earthquakes**. Frequent mentions of structural damage and reconstruction suggest adaptations in building techniques, highlighting **indigenous earthquake-resistant practices**.

e) Supplement to Modern Seismology
- In regions like Northeast India, where instrumental data are limited before the 20th century, historical sources like the Cheitharol Kumpapa are **critical for seismic hazard assessment and planning**.
- They complement geological surveys, paleoseismology, and tectonic studies, forming a **holistic view of earthquake risk**.

The *Cheitharol Kumpapa* is the official chronicle of the kings of Manipur, recording daily events at the royal court. Originally composed in Meetei Mayek and later in Bengali script, it preserves political, social, and environmental events. Earthquakes are frequently noted in the chronicle, often interpreted as divine warnings or significant omens. The chronicle's reliability has been supported by cross-checking with independent sources such as geological records and reports from neighboring regions.

3) Earthquake History of Manipur

The **1548 CE earthquake** in the **Imphal Valley, Manipur** is considered one of the earliest significant seismic events recorded in the region. Historical evidence of this earthquake comes primarily from the **Cheitharol Kumpapa**, the royal chronicle of Manipur, which meticulously documented political, social, and natural events.

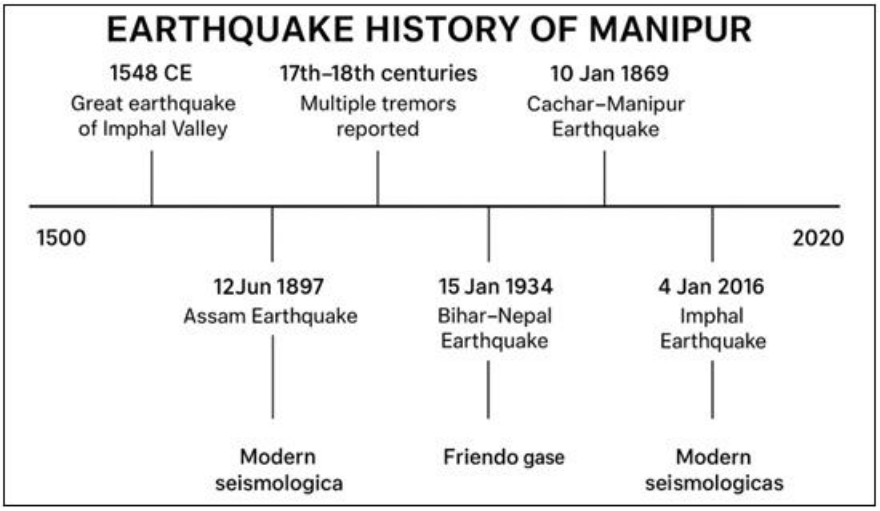

Figure 1: Systematic representation of Earthquake History of Manipur

Key Points:

a) **Date & Event**:
- Year: **1548 CE**
- Nature: Major earthquake affecting the Imphal Valley and surrounding areas.

b) Source of Record:
Cheitharol Kumpapa (Royal Chronicle of Manipur)
- The chronicle provides narrative descriptions of tremors, destruction, and societal impact.
- Records suggest this earthquake caused noticeable damage to settlements and possibly influenced local architecture and settlement patterns.

c) Magnitude & Intensity:
- No instrumental measurement exists (pre-modern seismology era).
- Based on historical accounts, it is inferred to be a **strong earthquake**, possibly in the range of **M6.5–7.0**, with significant local damage.

d) Impact on Society & Architecture:
- Likely destruction of traditional houses and public structures.
- Influenced the evolution of **earthquake-resistant construction** in Meitei settlements, as later structures were designed with flexibility and light materials.

e) Seismic Significance:
- Highlights the **seismic vulnerability of the Imphal Valley**, which lies near the **Himalayan arc and tectonic boundary zones**.
- Forms part of the historical seismic record used to assess **long-term earthquake hazards** in Northeast India.

Here's a **chronological table of major historical earthquakes in Manipur**, including the 1548 CE event, based on historical records like the **Cheitharol Kumpapa** and modern studies:

Year (CE)	Name / Location	Magnitude / Intensity*	Impact / Notes	Source
1548	Imphal Valley	~M6.5–7.0 (est.)	Major tremor; damage to settlements; influenced traditional house construction.	Cheitharol Kumpapa
1679	Manipur region	Estimated strong	Recorded in royal chronicles; affected local communities.	Cheitharol Kumpapa
1720	Manipur region	Estimated moderate	Tremors reported; no large-scale destruction.	Cheitharol Kumpapa
1765	Manipur region	Estimated strong	Significant tremors; historical mention of structural damage.	Cheitharol Kumpapa
1869 Jan 10	Cachar–Manipur	M6.5–7.0 (estimated)	Felt strongly in Imphal; damage to buildings; recorded in local chronicles.	Cheitharol Kumpapa & British records
1939	Manipur region	~M6.0–6.5	Felt in Imphal Valley; minor structural damage reported.	Geological Survey of India
1988 Aug 28	Manipur region	M6.6	Felt in entire Northeast India; some damage in Imphal.	Seismological records

4) Pre- instrumental earthquakes recorded in the Cheitharol Kumpapa

- **1548 CE** – A major earthquake is recorded, with widespread shaking and damage across the valley. Considered one of the earliest documented earthquakes in northeast India.
- **17th–18th centuries** – Multiple entries describe the "earth shaking" on different occasions, suggesting frequent seismic activity.
- **1869 Cachar–Manipur Earthquake (Mw ~7.5)** – Occurred on 10 January 1869. Severe shaking was reported in both Cachar (Assam) and Manipur. The chronicle provides detailed accounts of house collapses, fissures, and landslides. This event is crucial as it predates instrumental seismic scales and yet provides rich historical data.

5) Instrumental and modern earthquakes

- **1897 Assam Earthquake (Mw 8.1):** Though centered in the Shillong Plateau, it caused damage and strong tremors in Manipur.
- **1934 Bihar–Nepal Earthquake (Mw 8.1):** Strongly felt across Manipur.
- **1988 Indo–Burma Border Earthquake (Mw 7.3):** Caused structural damage in the region.
- **2016 Imphal Earthquake (Mw 6.7, 4 January):** Resulted in widespread building collapses, particularly in poorly constructed masonry and reinforced concrete buildings; traditional timber/bamboo houses showed relatively better resilience.

2. Significance of Historical Documentation

Historical documentation, such as royal chronicles, manuscripts, and local records, plays a **crucial role in understanding past seismic events** in regions where modern instruments were unavailable. In the context of Manipur and the Imphal Valley, documents like the **Cheitharol Kumpapa** are invaluable for several reasons:

a) **Reconstruction of Past Earthquakes**

- Historical records provide **dates, locations, and descriptions of damage**, allowing researchers to reconstruct the **occurrence and intensity of earthquakes** before the era of seismographs.
- Example: The **1548 CE earthquake** in the Imphal Valley is documented in the Kumpapa, giving insight into its impact on settlements and society.

b) Estimation of Seismic Magnitude and Intensity

- Narrative descriptions of destruction, ground shaking, and societal effects allow estimation of **magnitude** and **Modified Mercalli Intensity (MMI)** for historical events.
- This helps create **seismic hazard maps** for regions with limited modern data.

c) Understanding Recurrence and Patterns

- Chronological documentation reveals **recurrence intervals** and patterns of seismicity, which are critical for **long-term earthquake risk assessment**.
- In Manipur, repeated records of tremors across centuries indicate the **persistent seismic vulnerability** of the Imphal Valley.

d) Insights into Human and Architectural Response

- Historical accounts describe **damage to buildings, temples, and settlements**, reflecting the **resilience and adaptation strategies** of local communities.
- These insights guide the study of **traditional earthquake-resistant techniques**, such as the construction of Meitei houses with lightweight materials and flexible structures.

e) Supplement to Modern Seismology

- Historical documentation **bridges the gap** between paleoseismology and modern instrumental records, providing a **continuous timeline** of seismic activity.
- It enhances **risk assessment, urban planning, and disaster preparedness**, particularly in earthquake-prone regions like Northeast India.

3. Discussion

The integration of historical chronicles and modern seismic science offers a **comprehensive view of regional hazard patterns**. The Cheitharol Kumpapa confirms that destructive earthquakes have struck Manipur for centuries. The records also align with modern tectonic understanding of the Indo-Burma arc as an area of frequent seismic release. Importantly, the chronicle highlights how earthquakes were perceived not just as natural disasters but as socio-political events with symbolic meaning. This perspective can inform today's disaster preparedness by linking scientific risk awareness with cultural heritage.

4. Conclusion

Manipur's earthquake history, as reconstructed from both the Cheitharol Kumpapa and modern records, demonstrates that the region has been repeatedly impacted by significant seismic events. The chronicle provides invaluable pre-instrumental data, confirming long-standing seismic activity in the Imphal Valley. Recognizing this historical continuity is essential for present-day hazard assessment, earthquake-resistant construction, and community awareness in one of India's most earthquake-prone states.

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