



KAMARAJ IAS ACADEMY
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Varkala Cliff: A Geo-Heritage Site at Risk

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Why in News?

The **National Green Tribunal (NGT)** has recently ordered a status report from the **Geological Survey of India (GSI)** and other relevant authorities regarding the deteriorating condition of **Varkala Cliff**, a prominent geo-heritage site in **Kerala**. The cliff, which is under threat due to unregulated tourism and climate change, is facing significant environmental degradation.

About Varkala Cliff

Location:

Varkala Cliff is located near **Thiruvananthapuram**, Kerala, offering breathtaking views of **Varkala Beach**. It is renowned for being the largest geo-heritage site in the state and is a crucial coastal landform.

Designation:

Varkala Cliff was designated as **India's 27th National Geological Monument** by the **Geological Survey of India (GSI)** in **2014**, emphasizing its importance as a natural heritage site.

Geological Significance:

- The cliff is a part of the **Warkalli Formation**, which dates back to the **Mio-Pliocene epoch** (~5.3 million years ago).
- Its structure consists of **laterite**, **sandstone**, and **carbonaceous clay** layers, contributing to the rich ecosystem and diverse microhabitats.
- Beneath the sandstone lies a vital **aquifer** that provides high-quality water to the surrounding areas.

Cultural and Historical Importance:

- The cliff is also historically significant, associated with **Sri Narayana Guru**, who promoted his inclusive religious philosophy here.
- Varkala is often referred to as a '**mini-Goa**' due to its pristine environment and serene atmosphere, attracting numerous tourists.

Factors Leading to Degradation

1. Unregulated Tourism:

- **Unplanned development** has led to unauthorized constructions, such as resorts, cafes, and parking spaces on the cliff.

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- This has caused damage to the natural landscape and disrupted the ecosystem.

1. Coastal Erosion and Climate Change:

- Coastal erosion, worsened by large-scale port constructions at **Kovalam** and **Vizhinjam**, has contributed to the vulnerability of Varkala Cliff.
- Climate change exacerbates these issues, putting further pressure on this delicate geological formation.

1. Waste Mismanagement:

- Many eateries and businesses in the area lack proper **waste disposal systems**, leading to wastewater seepage that erodes the base of the cliff.

1. Violation of Coastal Regulation Zone (CRZ) Guidelines:

- Varkala falls under **Coastal Regulation Zone (CRZ) 3B**, which prohibits construction within 200 meters of the **High Tide Line**. However, this regulation is often violated, further contributing to the degradation of the site.

What Are Geo-Heritage Sites?

Geo-heritage sites are areas of significant geological interest. They are essential for understanding Earth's history, natural processes, and cultural ties. These sites:

- Provide insights into the Earth's **evolutionary history**.
- Feature unique **geological formations, fossil beds**, and other significant landforms.
- Play an essential role in **scientific research, education**, and **tourism**.

The **Geological Survey of India (GSI)** is the key authority responsible for identifying and safeguarding these sites.

The **Varkala Cliff** is a valuable geo-heritage site that faces numerous threats, particularly from **unregulated tourism, coastal erosion**, and **climate change**. These factors, compounded by violations of environmental regulations, put this natural wonder at risk. Efforts to safeguard Varkala Cliff are critical, and the recent intervention by the **National Green Tribunal** highlights the need for sustainable tourism, effective waste management, and stricter adherence to coastal regulations to preserve this important geological and cultural heritage for future generations.