

The Traditional Indian Solutions to Natural Disaster Mitigation

Many ancient Indian ways to deal with them. For instance, the text *Kamandakiya Nitisara* (c. 500-700 CE) enumerates 15 categories of disasters including those caused by excessive rainfall and drought.

For earthquake resilience, the Pallavas of Kanchi strengthened stone structures by using precisely cut joints without mortar and inserting granite layers as binders, improving resistance to seismic movement. The Kakatiya dynasty of Warangal, which built the UNESCO World Heritage site of Ramappa Temple in the 13th century CE, employed 'sandbox' technology in its construction to help the structure withstand seismic forces. In the Himalayan region, traditional techniques like *Kath Kuni* from Himachal Pradesh continue to offer earthquake-resistant solutions. This style combines interlocking deodar wood, stone and hay without mortar, creating flexible structures that can withstand tremors. Small doors and windows with strong wooden frames reduce structural stress, while heavy slate roofs add stability. Another Himalayan technique, *Dhaji Dewari*, uses timber frames with earth infill and is considered more economical and time-efficient.

conservation. For instance, the indigenous practice of *jhum* cultivation from Northeast India uses controlled burning to clear pests and weeds while preventing large fires through local knowledge of wind patterns, vegetation, topography and buffer forests. The ash also restores soil nutrients on rain-washed hill slopes. It is important to note here that, historically long fallow cycles allowed ecological recovery unlike today's shortened cycles caused by population pressure. Uttarakhand, winter burning on steep hill slopes promotes grass regrowth, supports livelihoods, maintains biodiversity and lowers wildfire risk in the Himalayan Forest. In Central India, tribal communities conduct controlled burning in early summer, create fire-breaks around villages and fields, monitor animal behaviour and vegetation changes to predict fires. Forest fire management is generally a community effort and the indigenous knowledge is passed down across generations. Community traditions such as planting fire-resistant trees among the Khasi tribe of Meghalaya and seasonal fire bans among the Munda tribe of Jharkhand further highlight the role of traditional knowledge in disaster mitigation. Since the time of the Mauryan Empire, water harvesting systems played an vital role in India for drinking water, irrigation and adaptation to extreme weather. Traditional reservoirs and tanks helped tackle droughts, recharge groundwater and reduce soil erosion through community participation. The Vijayanagara Empire (13th-17th century CE) for instance, developed extensive community-managed tank systems for agriculture and drinking water. Today, these neglected traditional practices are regaining importance amid growing water scarcity in Gujarat and Delhi historically relied on stepwells like *Baolis* and *Bawaris* for water conservation. Their layered steps reduced evaporation, while canals diverted rainwater into reservoirs to recharge aquifers. Karnataka's Pushkarni stepwell at Hampi is another example of efficient water storage. *Jhalaras* collected seepage from upstream reservoirs, *Kunds* stored rainwater in underground wells for drinking, and *Nadis* served as village ponds harvesting rainwater from nearby catchments. Even during the Mauryan period, *Arthashastra* stressed maintaining food and water reserves to mitigate droughts, seeking assistance from friendly foreign governments, etc. to mitigate droughts. He also gave paramount importance to the preservation of natural resources, such as planting suitable vegetation to protect drylands, conserving pasturelands, protection of forests, water reservoirs and mines for ecological preservation.

अग्निना ग्रामे दहमाने सर्वे नागरिकाः अम्यवपचेरन् । यश्च न अम्यवपचेत् तस्य द्वादशपणो दण्डः ॥ (Arthashastra, Book 4)

Vedic scholars gave more importance to prevention than cure and hence suggested suitable firefighting implements, fire brigades and water backups to deal with fires. For instance, Kautilya's *Arthashastra* prescribes that every household should keep some indigenous devices to douse fire. The city superintendents are instructed to set up fire extinguishing devices in various public places as precaution. Interestingly, the indigenous practices against forest fires advocate for 'controlled' burning, contrary to the policy of complete fire suspension followed in modern forestry. This is done to avoid the accumulation of excess dry matter (leaves, twigs, etc.) that induces catastrophic wildfires and promote the growth of new vegetation aiding in biodiversity

Wisdom Word Search

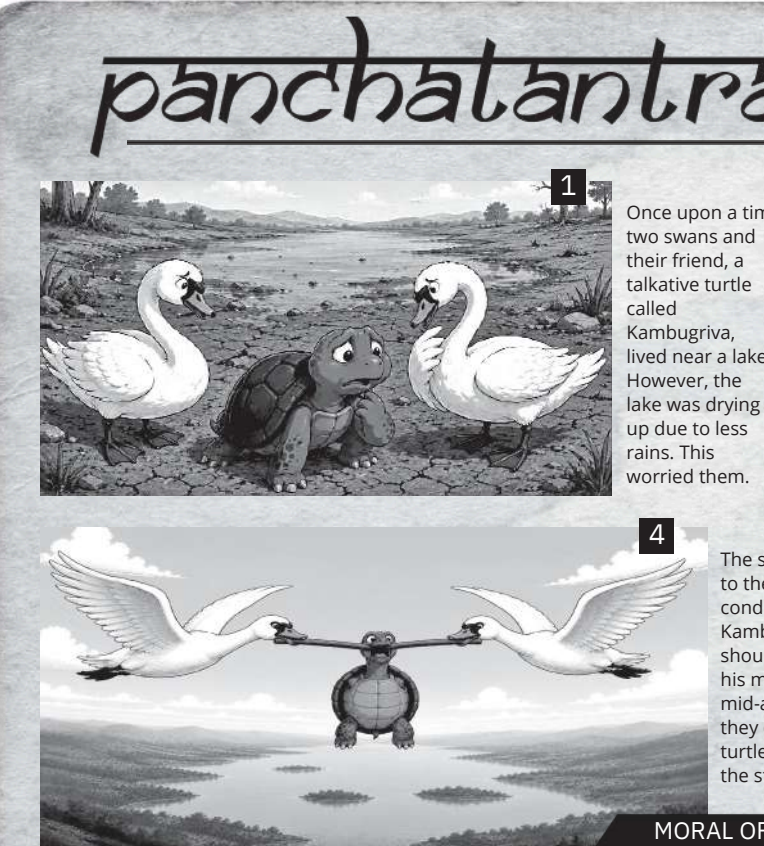
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WORDS TO FIND
Atiya, Chaigoinung, Ching, Eeshing, Leikhul, Malem, Mei, Nong, Nungshit, Paat

ATIYA- The sky or celestial expanse, symbolising the vast cosmic order above the earth.
CHAIGOINUNG - Environment; the encompassing natural world that sustains life, including land, water, air, flora, fauna and the interconnected ecological balance of existence.
CHING - Hill or mountain; elevated landforms central to ecology, watershed systems and sacred geography.
EESHING - Water; the life-sustaining natural element essential for survival and balance.
LEIKHUL - Cave; a natural subterranean space, often associated with sacred geography, ancestral memory and ecological refuge.
MALEM - The earth or world; the living land that nurtures all forms of life.
MEI - Fire; transformative natural energy symbolising warmth, purification and vitality.
NONG - Rain; seasonal precipitation vital for agriculture and ecological renewal.
NUNGSHIT - Sunshine or sunlight; life-giving warmth sustaining crops and natural cycles.
PAAT - Lake; a large natural water body central to sustenance, fisheries, agriculture and the cultural landscape of Manipur.

Note: These terms come from Manipuri, one of India's 22 Scheduled Languages.

panchatantra



1 Once upon a time two swans and their friend, a talkative turtle called Kambugriva, lived near a lake. However, the lake was drying up due to less rains. This worried them.

2 The turtle Kambugriva suggested that the swans fly around and look for another lake. This led them to find a huge lake with plenty of water at a distance from where they were.

3 When the swans came back, they decided to move to the bountiful lake. The problem was how the turtle would ever reach there. Kambugriva suggested that both the swans would hold two ends of a stick in their mouth and he would hang on to the middle of the stick with his mouth.

4 The swans agreed to the plan on the condition that Kambugriva should not open his mouth to talk mid-air. Thus, they carried the turtle hanging on the stick.

5 Soon they flew over a village. When the villagers looked up, they started to talk loudly about the incredulous scene of a flying turtle!

6 The turtle, wanting to react, opens his mouth to speak, loses his grip on the stick, and falls to his death.

MORAL OF THE STORY: Self-restraint and following good counsel is the key to safety and success.

friendly foreign governments, etc. to mitigate droughts. He also gave paramount importance to the preservation of natural resources, such as planting suitable vegetation to protect drylands, conserving pasturelands, protection of forests, water reservoirs and mines for ecological preservation.

वर्षासत्रो नदीपर्यन्ता ग्रामा बहिश्चरेयुः । तृणकाष्ठमपोहन्तः फलकवेणुनावाश्चरेयुः ॥ (Arthashastra, Book 4)

Kautilya considers floods as highly devastating. He advises that the villages located near water sources should be relocated to a higher ground above the flood level during monsoons. A stock of supplies such as gourds, skin bags, canoes, tree trunks, hand planks, bamboo poles and braided ropes should be kept ready along with rescue teams to evacuate people from inundated areas. He also highlights the importance of community involvement in the flood rescue operations. A Mahasthan inscription from the Mauryan period also reflects flood mitigation measures focussed on recovery and rebuilding mainly through agricultural support. Further, the conventional water harvesting systems as discussed above, also help in flood mitigation by collecting and storing excess precipitation, shielding from property damage without the need for additional constructions against floods. Over centuries, rural communities have relied on ecological knowledge to anticipate seasonal changes and withstand weather extremes. Texts like the *Taittiriyanisad* emphasise harmony between humans and nature as the basis of true prosperity. As climate change accelerates disasters across the globe, the modern solutions can be considered to be blended with indigenous wisdom that sustained its civilisation for centuries. From earthquake-resistant Himalayan architecture and community-led forest fire management to ingenious water harvesting systems and flood preparedness measures, India's traditional knowledge reflects a profound understanding of resilience, sustainability and coexistence with nature. Reviving these traditions and empowering communities who practice them can help India build not just disaster resilience, but also a more sustainable and resilient future.

Marvels of India

CHOLA RESERVOIRS

Marvels of Engineering, Environment and Sustainability

The Cholas developed an extensive network of interconnected tanks, channels and sluices that served as models of decentralised, community-managed irrigation systems. Raja Raja Chola-I built the still-functional Uyyakondan channel, constructed over 5,000 dams and established a dedicated water ministry: arguably the world's first institutional framework for water governance.

Ecological Intelligence: Groundwater and Flood Management

The design of Chola water structures was closely aligned with local topography and seasonal rainfall patterns, helping prevent water wastage, promote groundwater recharge and sustain agriculture. The Eri (meaning tank in Tamil) network recharged groundwater, maintained water levels in wells and prevented soil erosion: functions that the ecologists today recognise as critical ecosystem services.

Community Governance: The Eri-Variyam System

The Eri-Variyams (tank committees) actively managed water bodies, with considerable involvement from village assemblies and temples, which contributed their land and human resources. This decentralised stewardship ensured maintenance, equitable distribution and local accountability: principles now championed in modern integrated water resource management.

A Legacy Still Alive

In 2022, the International Commission on Irrigation and Drainage recognised Kallanai (meaning stone dam in Tamil) as a World Heritage Irrigation Structure. Many ancient Chola techniques underpin modern irrigation practices in Tamil Nadu, highlighting their enduring relevance.

Long ago there was a farmer who lived with his wife and infant son in a village. The couple loved their son a lot. One day, while returning from the fields, the farmer found a little injured mongoose lying near the road. The farmer picked it up and brought it home. He told his wife that the little mongoose would be a pet for their son. His wife was not happy with the idea, however, accepted reluctantly. The farmer tended to the wounds of the mongoose and nourished it with food. As a result, the mongoose recovered quickly. The farmer's son and the mongoose started growing together. One day the farmer's wife had to visit the market. She put her son to sleep instructing her husband to look after him. She told him not to allow the mongoose go near their son. She considered it unsafe for the animal to be in close proximity with the infant. The husband assured her that he would take good care of the baby. Soon after his wife had left for the market, the farmer was summoned by the local moneylender. The moneylender wanted his money to be returned that he had lent to the farmer. Due a good harvest that season, the farmer had the money ready with him. The baby was in deep sleep, thus the farmer could not take the child with him. He placed the child in his cradle and left him with the mongoose. He believed that the mongoose was an intelligent animal and could take care of their son. After some time, when the farmer's wife

came back with a basket full of vegetables, she found the mongoose waiting for her outside the house. She looked at the mongoose and realized that something was not right. She was shocked to see the face and paws of the mongoose smeared with blood. "You terrible creature, you have killed my son!" she cried and struck the mongoose on the head with her basket. She ran inside and was relieved to find the baby sleeping peacefully in his cradle. On the floor lay a black snake, that had been torn into pieces and was bleeding. The snake appeared very poisonous. The farmer's wife understood the chain of events. The mongoose must have seen the snake and in order to protect the sleeping baby, it killed the snake. The wife was extremely regretful about her action. With tears in her eyes, she lifted the heavy basket to find the loyal mongoose dead.

Moral of the Fable
Acting impulsively in anger leads to regretful consequences.

Did you know?

The Floating Islands of Loktak

Manipur's Loktak Lake is home to the world's only floating national park. The lake features "Phumdis," unique, heterogeneous masses of vegetation, soil, and organic matter that float on the water's surface. These floating islands support the endangered Sangai (brow antlered deer). This delicate ecosystem serves as a vital carbon sink and a natural water purifier, showcasing how traditional biodiversity can survive within unique geological formations through community led conservation efforts.

Fable with Moral

The Loyal Mongoose



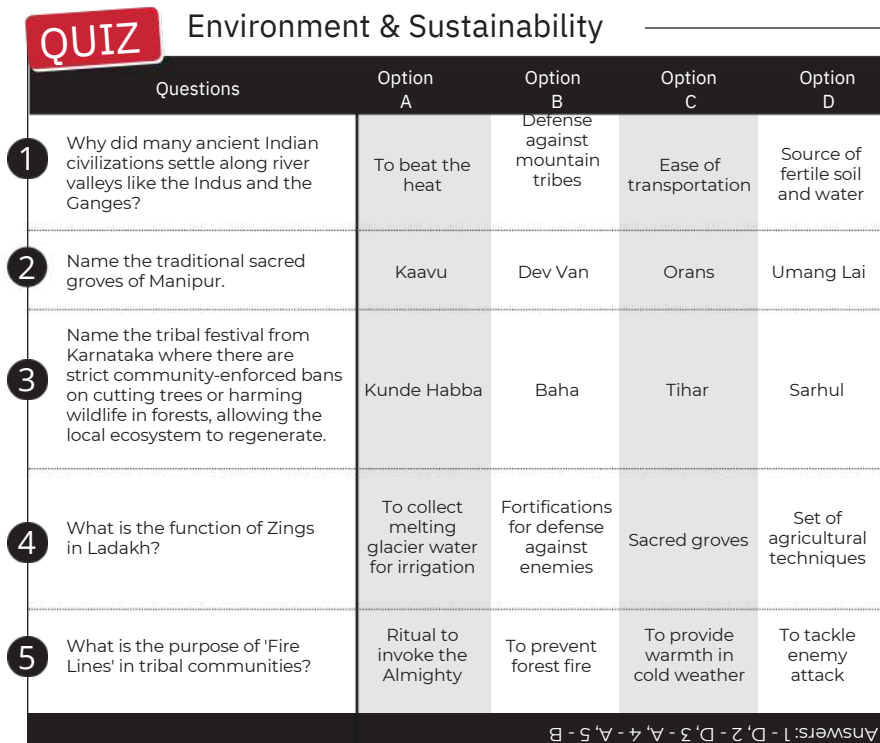
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QUIZ Environment & Sustainability

Questions	Option A	Option B	Option C	Option D
1 Why did many ancient Indian civilizations settle along river valleys like the Indus and the Ganges?	To beat the heat	Defense against mountain tribes	Ease of transportation	Source of fertile soil and water
2 Name the traditional sacred groves of Manipur.	Kaavu	Dev Van	Orans	Umang Lai
3 Name the tribal festival from Karnataka where there are strict community-enforced bans on cutting trees or harming wildlife in forests, allowing the local ecosystem to regenerate.	Kunde Habba	Baha	Tihar	Sarhul
4 What is the function of Zings in Ladakh?	To collect melting glacier water for irrigation	Fortifications for defense against enemies	Sacred groves	Set of agricultural techniques
5 What is the purpose of 'Fire Lines' in tribal communities?	Ritual to invoke the Almighty	To prevent forest fire	To provide warmth in cold weather	To tackle enemy attack

Answers: 1-D, 2-B, 3-C, 4-A, 5-B

The Flying Turtle



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