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Khejri (*Prosopis cineraria*): The Lifeline of The Desert Ecosystem

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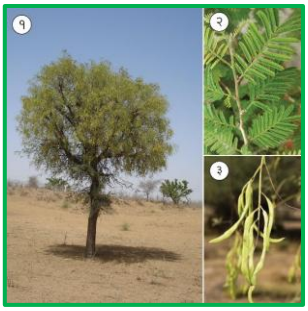

The Thar Desert, covering 200,000 sqkm across northwestern India, is a region of environmental extremes. It faces temperatures ranging from -2.5°C to 49.9°C, minimal rainfall (100–500 mm annually), and high evaporation rates.The Khejri Tree (*Prosopis cineraria*) often called the "Lifeline of the Desert," the Khejri tree is uniquely adapted to this harsh climate.

Key characteristics include:

- **Resilience:** As the only leguminous tree to thrive here, it remains green and productive even during the peak dry season (March–June).
- **Physical Stature:** It reaches heights of 10–12 meters with a wide canopy that provides essential shade.
- **Regional Names:** Known as *Shami* (Sanskrit), *Jand* (Punjab), and *Janti* (Haryana), among others.

Cultural Significance & Ecological importance

The Khejri tree is deeply revered by the **Bishnoi community**. In a historic display of conservation, **Amrita Devi** and 363 others sacrificed their lives to protect these trees from being felled for a royal palace, cementing the tree's status as a symbol of environmental commitment. Khejri-based agroforestry is a highly efficient system that provides critical **ecosystem services**, balancing agricultural production with environmental conservation.

- **Resource Supply:** Provides a reliable source of food, fodder, and firewood for rural communities.
- **Environmental Regulation:** Acts as a natural defense against desertification by controlling erosion, sequestering carbon, and improving the local microclimate.
- **Biodiversity Support:** Its canopy offers essential shade and habitat for birds, insects, and mammals.

Soil and Nutrient Enhancement

The Khejri tree is a **nitrogen-fixing legume** that improves soil health through three primary processes:

1. **Biological Nitrogen Fixation:** Directly increases nitrogen levels in the soil.
2. **Biomass Decomposition:** Fallen leaves and organic matter enrich the upper soil layers.
3. **Deep-Root Nutrient Uptake:** As a **phreatophyte**, its deep roots reach water and nutrients far below the surface, bringing them up to benefit shallow-rooted crops without competing for surface water.

Traditional and cultural significance

The Khejri tree is deeply embedded in the spiritual and cultural fabric of the Thar Desert, holding a sacred status across various traditions, Religious and Mythological Links

- **The Ramayana:** According to the Valmiki Ramayana, Lakshman used Khejri branches to build the *Parnakuti* (hut) for Lord Rama and Sita during their exile.
- **The Mahabharata:** The Pandavas are said to have worshipped the tree and hidden their weapons within its branches during their *Agyatavasa* (year in disguise).
- **Vedic Rituals:** Since ancient times, Khejri wood has been used to ignite the sacred fire for *yagyas* (devotional rituals).

Local Customs and Worship

- **Lord Krishna:** In Rajasthan, the tree is a symbol of Lord Krishna. During Janmashtami, households worship green Khejri twigs.
- **Sampuja:** This ancient practice of tree worship remains a vital tradition.
- **Social Ceremonies:** The tree plays a central role in local marriage rituals, where its leaves and branches are used to symbolize prosperity and connection to the land.

Medicinal and Nutritional Value

The Khejri tree serves as a "superfood" for both humans and livestock:

- **For Humans:** Immature pods are eaten fresh or dehydrated as vegetables. They are rich in **Vitamin C, protein (18%), and minerals** like calcium, phosphorus, and iron. Ripe, dried pods can also be ground into flour for bakery items like biscuits.
- **For Livestock:** The leaves provide high-protein fodder, essential for sustaining animals in arid environments.

Nutrient content of pods of Prosopis cineraria

Sr. No.	Name of nutrient	Quantity
1	Protein	23.2%
2	Carbohydrate	56.0%
3	Fat	2.0%
4	Fibre	20%
5	Vitamin ‘C’	523.0 (mg/100g)
6	Calcium	414 (mg/100g)
7	Ferrous	19.0 (mg/100g)
8	Energy	334.8 (Kcal/gm)

Economic Benefits

The Khejri tree is the **socio-economic backbone** of the Thar Desert, offering a unique blend of survival and sustainability.

Livelihood Support: It provides essential food, fodder, and timber, sustaining rural economies during droughts.

- **Environmental Guardian:** As a "climate-smart" tree, it prevents soil erosion, enriches soil nitrogen, and maintains the water table.
- **Cultural Icon:** It remains a symbol of conservation and spiritual reverence, particularly for the Bishnoi community.

Importance to society

The Khejri tree is a cornerstone of desert life, providing essential relief and spiritual grounding for the people of the Thar:

- **Essential Shelter:** Its wide canopy offers vital shade for travelers, water huts, and marriage parties. It also serves as a critical refuge for livestock during the scorching summer.
- **Cultural Symbolism:** The proverb *"Gaon Gaon Gogo ne Gaon Gaon Khejri"* highlights its presence in every village, where it traditionally shelters shrines of the deity Goga.
- **Sacred Protection:** Revered by the **Bishnoi community**, the tree is considered sacred; cutting it is strictly forbidden, making it a living symbol of desert conservation.

Challenges

Despite its immense value, the Khejri tree is facing an alarming population decline due to shifting ecological and industrial factors:

- **Solar Development:** While Rajasthan is a hub for solar energy, large-scale installations often result in the clearing of thousands of Khejri trees to make room for panels.
- **Environmental Stress:** Climate change, depleting groundwater, and the spread of fungal diseases and termite attacks are significantly weakening the species.
- **Urbanization & Competition:** Rapid urban growth leads to unchecked cutting. Additionally, native Khejri trees are increasingly being replaced by fast-growing, non-desert species like Neem, Gulmohar, and Peepal.

Integrated management to save Khejri from drying up

Over the past decade, due to excessive exploitation of groundwater, lack of rainfall, infestation of insects and fungi in the roots and trunks, and lack of proper care, an average of 1.10 to 8.18 percent of trees are drying up every year. This problem is gradually increasing in the areas where it has started.

Reasons for drying of Khejri

Falling groundwater level, Khejri root borer Celoston scabrator, dry trees standing in the field, Khejri root rot disease, indiscriminate pruning of trees, Indiscriminate use of machinery in the fields

Measures to prevent Khejri from drying

To protect Khejri trees from drying up, it is essential to immediately uproot and remove dead trees to halt the spread of pests and fungi, while planting new saplings during the monsoon to ensure ecological balance. Effective water management involves digging a ring-shaped trench around the tree to harvest rainwater and covering it with mulch in summer to prevent evaporation. Additionally, farmers should use light traps or waste fires at night to eliminate harmful insects and manually remove and burn any *Ganoderma* fungal growths with kerosene to prevent further infection.

Conclusion

Policy Reform: Revise the **Rajasthan Tenancy Act** to enforce stricter penalties for illegal felling.

Sustainable Development: Mandate tree **translocation** (moving rather than cutting) for infrastructure projects.

Afforestation: Implement a dedicated policy to replant native Khejri rather than invasive, fast-growing species to ensure the long-term survival of Rajasthan's fragile ecosystem.

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