

Sacred knowledge, Sustainable Earth: The role of Indian Knowledge System in Environmental Stewardship

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Abstract

The Indian Knowledge System (IKS), encompassing a vast range of traditional knowledge, practices, and philosophical frameworks, has long been intertwined with environmental sustainability. It offers a holistic framework for a green economy and sustainable development by providing ancient insights into environmental harmony, resource conservation, and community well-being, which align with modern goals. This includes practices like sustainable agriculture, traditional water management, and the emphasis on ecological balance, which can help address challenges like climate change and biodiversity loss. Rooted in ancient scriptures, rituals, and practices, IKS emphasizes a holistic approach to life, advocating for the harmonious coexistence of humans and nature. This paper explores how Indian knowledge systems—spanning from Vedic teachings to contemporary ecological practices—inform and inspire sustainable environmental practices today. It critically examines the role of IKS in addressing current environmental crises, focusing on principles such as balance, reverence for nature, and the interconnectedness of all life. The principles of the Indian Knowledge System can guide the transition towards a green economy by promoting practices that are environmentally sound, socially equitable, and economically viable.

Keywords: Indian Knowledge System (IKS), traditions, environment conservation, sustainability, management.

Introduction

Environmental sustainability denotes the capacity to preserve ecological integrity and conserve natural resources in ways that ensure the well-being of both present and future generations. The United Nations Brundtland Commission (1987) articulated sustainability as “meeting the needs of the present without compromising the ability of future generations to meet their own needs” (Tripathi, 2025). In the twenty-first century, environmental sustainability has emerged as a critical global priority (Shroff, 2025). The Indian subcontinent has historically served as a fertile ground for diverse philosophical, cultural, and spiritual traditions (Suthar, 2025). These traditions place profound emphasis on reverence for nature, viewing the natural world as a sacred entity with which humans exist in a mutually dependent relationship (Baig, 2024; Kavita, 2025). While contemporary environmental initiatives often stem from scientific inquiry and activist movements, the Indian Knowledge System (IKS) provides an indigenous epistemological framework for

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sustainability that has evolved over thousands of years. Indigenous Knowledge refers to structured community-based wisdom transmitted intergenerationally through oral traditions and social learning (Tripathi, 2025).

Major Indian philosophical schools including Vedanta, Jainism, and Buddhism along with culturally rooted practices derived from local knowledge, advocate for the interconnectedness of all life forms and underscore the responsible stewardship of natural resources. IKS emphasizes the collective welfare of all beings (Lokasamgraha), aligning with sustainable development objectives concerning health, education, and social equity. Ayurveda, for instance, promotes holistic well-being and the sustainable use of medicinal plants, thereby contributing to a resilient health economy (Tripathi, 2025). Furthermore, IKS offers empirically validated strategies for the sustainable management of natural resources. Traditional water-management systems and biodiversity conservation practices such as sacred groves (Devrai) provide robust models for contemporary environmental planning. Indigenous knowledge also supports a green economy through ecologically harmonious livelihood practices that help alleviate poverty and strengthen rural communities. Foundational principles such as *Ahimsa* (non-violence) and nature reverence exemplified by the worship of sacred trees form the ethical basis for environmental conservation (Mensah, 2019). Practices like organic farming, johads and baolis for water conservation, and the use of natural fertilizers reflect a sophisticated understanding of long-term ecological balance (Shroff, 2025). Indian Knowledge Systems thus constitute a vast repository of ecological wisdom that prioritizes sustainable living and environmental equilibrium. Importantly, IKS is not a uniform body of knowledge; rather, it encompasses a spectrum of culturally and geographically specific practices and innovations (Singh & Ahmad, 2025). This paper examines the philosophical foundations of IKS and analyses their relevance in shaping contemporary approaches to environmental sustainability.

1. Foundations of the Indian Knowledge System

1.1 Vedic and Vedantic Wisdom

The Vedas, regarded as the earliest scriptures of Indian civilization, introduce the foundational principles of *Dharma* (righteous conduct) and *Rita* (cosmic order), both of which are central to understanding environmental sustainability in the Indian worldview (Dwivedi, 1993). Vedic literature particularly the *Atharvaveda*, *Isha Upanishad*, *Manusmriti*, and *Matsya Purana* underscores the sanctity of nature through rituals and invocations dedicated to elements such as water, fire, and earth (Shroff, 2025). The ritual worship of *Agni* (fire), for instance, symbolises not only the vital energy required for life but also the responsibility of maintaining ecological balance.

Vedanta, the philosophical system grounded in the Upanishads, further expands the notion of *Vasudhaiva Kutumbakam*, a Sanskrit expression from the *Mahopanishad* meaning “the Earth is one family” by emphasising the unity of all existence (Roy & Roy, 2017; Malik, 2024; Sharma et al., 2025; Suthar, 2025). According to Vedantic teachings, humans, nature, and the cosmos are integrally connected; consequently, environmental degradation in one part of the system has unavoidable repercussions for the whole. Likewise, the principle of *Ahimsa* (non-violence), which

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is central to several Indian traditions, promotes the ethical imperative of minimising harm to all living beings and cultivating profound respect for life (Singh & Ahmad, 2025).

1.2 Jainism and Ecological Thought

Jainism, which emerged in India in the 6th century BCE, places extraordinary emphasis on *Ahimsa* beyond human relations and extends it to the protection of the natural world. Jain doctrine upholds the sanctity of every life form including microorganisms thereby promoting careful conduct toward plants, animals, and even insects (Shiva, 2005; Suthar, 2025). Texts such as the *Tattvartha Sutra* articulate the doctrine of *Anekantavada* (the multiplicity of perspectives), reinforcing the idea that all forms of life are interconnected and mutually dependent. These philosophical ideals manifest in eco-sensitive practices including vegetarianism, forest preservation, and the ethical use of water. Historically, Jain communities have also pioneered conservation initiatives, such as the establishment of water-harvesting systems in ecologically fragile and drought-prone regions.

1.3 Buddhism and Environmental Harmony

Buddhism likewise emphasizes environmental responsibility as an extension of ethical living. The Buddha's teachings on Right Livelihood and Right Action guide individuals toward moral conduct that respects all life forms and safeguards natural resources (Shiva, 2005). The philosophical concept of Dependent Origination highlights the interdependent nature of existence, forming a conceptual bedrock for environmental sustainability. Buddhist mindfulness practices encourage conscious awareness of human impacts on the natural world, thereby fostering sustainable lifestyles. Many Buddhist monastic and lay communities continue to integrate ecological values into daily life through forest conservation, organic agriculture, and waste-reduction practices.

2. Indigenous Ecological Knowledge in India

India's indigenous knowledge systems constitute a vast repository of ecological wisdom transmitted across generations through cultural practices, oral traditions, and community-based learning. These knowledge systems encompass sustainable approaches to forestry, agriculture, water management, and habitat protection.

2.1 Forests and Sacred Groves

Across numerous Indian regions, sacred groves forests preserved as part of local spiritual traditions serve as vital sites of ecological and cultural protection (Singh, 2024). Considered the abodes of deities and ancestral spirits, these groves are safeguarded through customary norms that restrict overexploitation. Local communities engage in sustainable extraction of forest resources such as medicinal herbs and firewood while protecting the ecological integrity of the ecosystem. In areas including the Western Ghats, the Khasi Hills of Meghalaya, and parts of Odisha and Maharashtra, sacred groves remain indispensable to both biological conservation and spiritual well-being. Functioning as ancient models of *in-situ* conservation, they long predate modern environmental legislation (Singh & Ahmad, 2025).

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Empirical research from Kerala reveals that sacred groves may host as many as 500 plant species per hectare significantly more than adjacent forest tracts highlighting their role as biodiversity micro-reserves for endemic and medicinal flora (Shroff, 2025). A historically notable example of community-led forest conservation is the Chipko Movement of the 1970s, where women in rural Uttarakhand embraced trees to halt deforestation, invoking the belief in the sacredness of trees (Gadgil & Vartak, 1976). Cultural events also reinforce ecological values: Van Mahotsav (Forest Festival) promotes tree plantation and afforestation efforts through the participation of schools, civil-society groups, and local communities. Likewise, the festival of Nag Panchami dedicated to the veneration of snakes, particularly cobras reflects symbolic recognition of reptiles and their ecological significance (Singh & Ahmad, 2025).

2.2 Water Conservation Techniques

Water conservation has historically constituted a fundamental pillar of traditional Indian ecological knowledge. Ancient civilizations such as the Harappan and Vedic societies engineered sophisticated hydrological infrastructure including stepwells, tanks, and rainwater-harvesting systems to secure reliable water availability, particularly in regions prone to aridity. In contemporary times, the restoration of such technologies has yielded notable ecological benefits. In Alwar district of Rajasthan, for instance, the revival of more than 1,000 traditional water-harvesting structures (*johads*) by the NGO Tarun Bharat Sangh led to a 33% increase in groundwater levels and the ecological rejuvenation of approximately 860 sq. km of land, including the revival of seasonal rivers like Arvari that had remained dry for decades. Stepwells (*baolis* and *vavs*), predominantly found in Gujarat and Rajasthan, served as essential rainwater-storage systems that sustained communities in semi-arid regions (Agarwal & Narain, 1999; Singh & Ahmad, 2025). The contemporary reinstatement of techniques such as *johad* (water ponds) and *kund* (traditional circular tanks) demonstrates the growing recognition of indigenous water practices as scalable solutions for addressing water scarcity and restoring ecological balance in rural landscapes (Shroff, 2025).

2.3 Agricultural Practices and Biodiversity

Traditional agricultural systems in India are firmly rooted in ecological ethics. Practices such as mixed cropping, crop rotation, and organic farming enhance soil fertility, preserve biodiversity, and minimise dependency on chemical inputs (Sundaram & Ranganathan, 2015; Singh & Ahmad, 2025). Diversified cropping in a single field functions as a natural mechanism of resilience against climatic variations and pest outbreaks (Singh, 2000; Kavita, 2025). The implementation of Zero-Budget Natural Farming (ZBNF) in Andhra Pradesh grounded in indigenous agricultural wisdom expanded to over 700,000 farms by 2020 and led to a 50–100% increase in soil microbial activity, increased drought tolerance, and up to 90% reduction in input expenditure (FAO, 2020; Shroff, 2025). Similarly, the Baranaja (literally “twelve grains”) multicropping system in the Himalayan region of Uttarakhand exemplifies community-driven agroecology that enhances nutritional security and soil health (Singh & Ahmad, 2025). Traditional farming also prioritises the use of

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indigenous seeds adapted to local ecological conditions, thereby reducing the need for external inputs.

Natural farming movements such as Sahaja Krishi, spearheaded by practitioners like Subhash Palekar, advocate cultivation without chemical pesticides or fertilisers by utilising natural ecological processes. Earlier systems, such as Rishi-Krishi, synchronised agricultural cycles with lunar rhythms and used organic inputs including cow dung, herbal extracts, and compost to sustain soil fertility (Shiva, 2005; Singh & Ahmad, 2025). Agnihotra farming, influenced by Vedic bioenergetic principles, involved fire rituals believed to support beneficial microbial activity and enhance soil vitality (Shroff, 2025).

Modern Applications of Indian Knowledge Systems in Environmental Sustainability

Escalating environmental crises including climate change, biodiversity decline, and deforestation have revitalised global interest in IKS as an effective framework for addressing contemporary sustainability challenges (Singh & Ahmad, 2025). Indigenous communities possess generations of knowledge regarding climatic variability, local weather cycles, and ecological responses, offering valuable insights into adaptation, resilience building, and mitigation strategies (Tripathi, 2025). India has increasingly witnessed policy and technological initiatives that blend traditional ecological knowledge with modern environmental science.

3.1 Green Energy and Renewable Resources

India's long-standing cultural reverence for natural forces including wind and solar energy forms an intellectual backdrop for its modern renewable energy initiatives. Practices such as Surya Namaskar (sun salutations) and devotional traditions centred on solar deities reflect recognition of solar energy as a source of vitality (Prasanna & Vandhana, 2022). This cultural ethos resonates with contemporary infrastructure such as the Pavagada Solar Park in Karnataka, one of the world's largest solar projects and a symbol of the transition toward clean energy (Poovanna & Nidheesh, 2017).

3.2 Sustainable Urbanism

With India experiencing rapid urbanisation, integrating traditional design principles into urban development has become imperative. Ancient architectural frameworks such as Vaastu Shastra emphasise the use of natural materials, optimal ventilation, and solar orientation to minimise energy consumption (Sharma et al., 2025; Shroff, 2025; Suthar, 2025). The Hawa Mahal in Jaipur stands as a historical exemplar of sustainable architecture, using lattice stonework to facilitate passive cooling. Likewise, in flood-prone Assam, traditional Chang Ghar houses were built on stilts to mitigate flood damage, while the Kath-Khuni architectural style of Himachal Pradesh employed interlocking stone-timber frameworks for insulation and seismic resilience (Agarwal & Narain, 1999; Shroff, 2025). Many contemporary Indian cities such as Bengaluru and Pune are adopting urban forests, green corridors, and sustainable water systems inspired by these traditional approaches.

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Challenges and Future Directions

Despite strong philosophical and empirical foundations, the large-scale adoption of IKS faces significant constraints. Industrial agriculture, resource commodification, and the systemic erosion of traditional knowledge due to urbanisation and globalisation continue to marginalise indigenous practices. Indigenous communities have long called for the legal recognition of their ecological knowledge and land rights. IKS is also vulnerable to misappropriation and commercial exploitation, particularly in the domains of herbal medicines, cosmetics, and pharmacology. Unauthorised extraction of traditional knowledge commonly described as *bioprospecting* or *biopiracy* allows external researchers or corporations to profit from indigenous intellectual heritage without proper recognition or benefit-sharing (Tripathi, 2025).

Addressing these challenges requires dialogue and collaboration among traditional knowledge holders, scientists, policymakers, and environmental practitioners. The incorporation of IKS into environmental policy frameworks, educational curricula, and sustainable development strategies is essential to fostering an ecologically balanced, culturally grounded future.

Conclusion

The Indian Knowledge System (IKS) offers comprehensive and profound insights into the principles of environmental sustainability that remain as relevant today as they were centuries ago. By respecting nature, practicing sustainable resource management, and promoting harmony among all living beings, India's traditional knowledge systems provide invaluable guidance for addressing the current environmental crisis. By integrating ancient wisdom with modern science, IKS can contribute significantly to achieving sustainable development in India and beyond.

Indigenous communities, in particular, have long practiced sustainable resource management, biodiversity conservation, and climate resilience through deeply rooted traditions and an intimate understanding of their natural environments. Indigenous afforestation, organic farming, and traditional water-harvesting techniques are prime examples of IKS-based practices that strengthen environmental sustainability. The Indian Knowledge System offers a unique and holistic framework for understanding the interconnectedness of human and natural systems. Indian philosophical traditions such as those found in the Vedas, Buddhism, and Jainism emphasize living in harmony with nature, minimizing harm to living beings, and embracing a simple and sustainable lifestyle. These ethical and ecological principles have the potential to complement scientific advancements, creating a balanced approach to tackling global sustainability challenges such as climate change, deforestation, and resource depletion. Therefore, it is essential to promote the inclusion of indigenous knowledge in policy, practice, and research to build a more sustainable world that respects both ecological and cultural diversity.

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