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Conservation Of Forests And Biodiversity In Ancient Indian Culture: A Summary Based On Ancient Writings And Archaeological Evidence

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Abstract

Since the beginning of human history, humans have continuously interacted with their surroundings. We will talk about the human relationship to the natural world and the environment, as well as how this relationship is supported by the knowledge that is available and by society's collective wisdom. We will learn more about the advances in science and technology made by ancient Indians later in this unit. From the earliest times to 200 BCE, the time period is covered. Early on in human history, people's lives and activities were heavily influenced by their environment. According to historical records, they were extremely close to forests and other natural resources. The sustainable concepts of forest ecology and conservation were reflected in ancient Indian texts like the Arthasastra, Sathapatha Bhramanas, Vedas, Manusmrti, BrhatSamhita, Ramayana, and Rajtarangini. Environmental consciousness was evident in several aspects of the social structure and city planning of the Indus Valley civilization. The pattern of biodiversity in those areas can be determined by the presence of leaves, wild animals like peacocks and one-horned deer, tigers, elephants, bulls, and seals in the mud pots. The extensive use of timber-wood for the combustion of bricks resulted in a decrease in forest cover in that region. As a result, rainfall decreased and soil erosion resulted in the accumulation of silt in the Indus River, which choked Mohenjodaro from the sea and raised the water table, which must have been a major factor in Mohenjodaro's demise. The ancient Indians had mastered a variety of arts in the field of science and technology. The Harappans built massive cities like Mohenjodaro and Harappa and established the subcontinent's first urban civilization. Their "granaries,"

dockyard, water tank, and other structures testify to their engineering prowess. Many people are impressed by the inventiveness of Aryabhatta, the iron and zinc smelters, whose contributions are so significant. In the past, numerous fields like mathematics, astronomy, geography, and medicine flourished, to which ancient Indians greatly contributed. In point of fact, only the ancient Greeks and Indians placed a high value on science and technology.

Keywords: Biodiversity, Ancient India, Forest, Sustainability, Environment

Introduction

In the ancient Indian societies, the connection between culture and ecology was an essential component. The ancient Indian civilizations relied heavily on interactions with various biological entities and concern for their preservation. Humans have had the ability to alter the earth's surface since ancient times. Civilization has altered the environment in a myriad of ways and on an unprecedented scale over the course of human evolution. The primary steps taken to alter the conditions that were already present are the use of fire, the domestication of animals, and early agricultural practices. Early on in human history, people's lives and activities were heavily influenced by their environment. According to historical records, they were extremely close to nature and its resources. The ancients devised numerous efficient measures to safeguard our ecosystems and environment, which are true examples of sustainable development. In our research, we try to bring to light a few texts and archaeological finds from ancient India that might very well reflect our ancestors' ideas about protecting the environment, forests, and biodiversity.

Indian Philosophy And Its Vision Of Environment

In the ancient Indian philosophical traditions, a harmonious relationship with the environment was advocated. Indian philosophy and its vision of the environment It was thought that the environment was a living, organic thing. It was acknowledged that man possessed the highest level of intelligence of any animal. Man was seen as a small component of the environment. He disappeared into it after his death. Man had close physical relationships with all living and nonliving things. On a spiritual level, man was required to follow a set of guidelines that laid out his responsibilities to other species. The fact that the environment should not be harmed or destroyed was acknowledged. The concept of harmony and cooperation in one's relationship with nature was prevalent in ancient Indian thought. The universe is thought of as Srsti in Indian philosophy. It represented Pasu, Pakshi, and Vanaspati's entire universe. The golden egg,

Hiranyagarbha, was the starting point for srsti's creation, which ultimately led to creation. It was necessary for both humans and srsti to maintain cordial relationships because they were both created by God. Earth and everything it contained were held in the highest regard. As the final Panch Tattva (earth, water, air, and sky), the Earth was regarded as the mother of all living things. She is said to be worthy of worship because it carried the material foundation for man's food. Prayers were said in the Vedas to ensure that the earth's resources and bounty would continue. They were supposed to be shared by everyone, not just humans, according to legend. Respect was shown to all living things by ancient Indian wisdom. Birds and animals were given special abilities and intelligence. They were able to foretell positive and negative events as well as changes in the climate or atmosphere that would occur in the future. It was believed that killing animals was a crime and was against the law. The manner in which certain animals were made the vahanas of particular gods and goddesses demonstrates this reverence for animals and the fact that they were sacrosanct. They deserved worship just as much as the Gods did. For instance, Ganesha sat on a mouse, Saraswati traveled on a swan, Indra rode an elephant, Siva had a bull as his vahana, and Visnu preferred Garuda. Even ancient kings acknowledged that abstaining from the killing of animals was an essential component of the ahimsa policy and should be adhered to. For instance, Ashoka outlined his policy of non-violence toward animals in the fifth Pillar edict. Parrots, mainas, red-headed ducks, akravaka geese, swans, nandi-mukhas, pigeons, bats, tortoises, boneless fish, goats, sows, and numerous other animals were included on the list of animals that could not be killed. One interpretation of this edict is that it is one of the earliest historical documents focusing on conservation practices that people should follow. Mayank Kumar, p. 24 and 25 in MHI-08, Block 5, Unit 16. This kind attitude toward nature dates back to the Rigvedic period, when various elements of nature were worshiped and personified by the wise men. They prayed to the Sun, Agni, Earth, and other gods for help. The glory of praise songs, or "rik," was chanted. The figure of Nataraja, also known as Dancing Siva, is the best illustration of how nature was viewed as one with divinity. Agni and deer are his emblems. The forests are his locks. He keeps Ganga inside himself. The moon and the sun are adorned by his hair. The snakes are his garlands. The tiger skin is on him. In a never-ending cycle of creation, degeneration, regeneration, and enlightenment, he brings the cosmic rhythm of his damaru to this world. Sakti is his vitality. He lacks something without her. As the Himalayan daughter, she must perform penance and austerities. Thus, ancient thought saw everything—

animate and inanimate, human and nonhuman—as a part of something larger than itself. Without the other, all beings were empty. For the universe to function in an orderly manner, this kind of wisdom required that everything be respected and protected.

Ancient Indian Writings Discuss The Concept Of Biodiversity And Forests

The Arthasastra of Kautilya, an ancient Indian text, discusses the concept of forests and biodiversity: Kautilya, also known as Chanakya, served as Chandragupta Maurya's minister from 321-297 BC, the first emperor of India. His book Arthasastra is a treatise on ancient Indian government and economics. According to the book, people were aware of the rainfall patterns, soil types, and appropriate irrigation methods in particular micro-ecological contexts. The book Arthasastra had a number of sutras in various chapters that dealt with various aspects of statecraft and administration, demonstrating environmental awareness.1 The book emphasized the importance of protecting and managing forests, gardens, and orchards because these were all regarded as sources of revenue in addition to being places to relax. Forests (aranya), village areas (gramya), mountains (parvata), wet or humid areas (audaka), drylands (bhauma), plains (sama), and uneven lands (visawa) were the various types of regions that the Arthasastra divided the nation into. Asmaka and Avanti, two well-known locations, received 13.5 and 23 dronas of precipitation on average each year, respectively (a drona is equal to 1.5 to 2 inches). Arthasastra demonstrates Kautilya's perception and concern for living creatures, including domestic and wild animals, plants, and vegetations. Together, the Asmaka (upper Godavari plains), Avanti (Malwa), and Aparanta (Konkan) formed a continuous territory.2 For hurting living things, there were specific penalties. Directors of forests, supervisors of animal slaughter, superintendents of cattle, horses, elephants, and pastures held special positions. These officials used to protect wildlife, make sure pets got enough food, control grazing, stop wild animal poaching, take good care of domestic animals, etc. Non-agricultural land was sometimes used for animal parks, where domestic animals were given full protection, and people were expected to follow rules when handling them. It was against the law to capture or kill animals in these sanctuaries. The scientific understanding of biodiversity was carried out by the discovery of a list of animals, fish, and birds that are protected. The responsibility for preventing animal cruelty in village communities was assigned to the village headman. The king is supposed to protect forests, elephant forests, irrigation works, and mines that were built in the past, as well as start new ones.3 Details of how to care for, train, and treat horses, elephants, and cows have been given.

According to Kautilya's account in Arthasastra, forests were regarded as a valuable resource, forest products should be used in a sustainable manner, and factories for forest products should be established. The offender received fines of varying amounts for cutting any part of a tree, depending on the type of injury. Particular emphasis was placed on those that produce fruit, flowers, or provide shade. The environmental issues outlined in the Arthasastra are very much relevant to contemporary society. Among the material forests, the one that was large, abundant in resources, accessible, and irrigated by a river was given greater importance because it could serve as a refuge in times of trouble. The Stockholm conference on human environment in 1972 mentioned a few principles that were very similar to the Arthasastra dictums. Even in India, the Water (prevention and control of pollution) Act of 1974, the Forest Conservation Act of 1980, and the Wildlife (Protection) Act of 1972 all have striking resemblances to the forms and content of the Arthasastra.

Science And Technology In Ancient India

India had enormous successes in the fields of science and technology from its earliest days. We will learn about the various aspects of Indian science and technology from the very beginning in this section of the unit.

Hydrology In Ancient India

In the past, in order to meet the requirements of agriculture, political leaders and even the locals introduced hydraulic techniques. They are highly advanced water harvesting methods, and these indigenous methods are still valued today. In the past, the location of habitation was typically influenced by the availability of water resources. With the assistance of science and technology, every effort was made to make use of the scant resources at our disposal in those regions devoid of water bodies. The field of hydraulic engineering saw numerous advancements. Harappan Civilization The first urban, civilized culture to survive in the Indian subcontinent is the Indus Valley civilization. The numerous features it possesses reveal the Harappan people's advanced technological capabilities. The Great Bath, which was discovered in Mohenjodaro, is one example. Both sides of the tank had steps leading to it. By incorporating gypsum into the mortar, waterproofing was achieved on the tank's base and side walls. To guarantee complete waterproofing, the sides were double-walled and the space in between them was filled with earth filling and bitumen coating. The tank received water from a well that was connected to it. One of the rooms that faced the open courtyard of the building complex contained the well. In the south-

west, a corbelled baked brick drain carried used water away. The tank's construction and water-proofing methods indicate a high level of hydraulic engineering expertise. A dockyard has been discovered at Lothal. It is evidence of the Harappans' engineering prowess. The first artificial basin ever constructed for sluicing ships at high tide is located in this dockyard. It is conceptually superior to Roman and Phoenician docks. On the west, its embankment walls measure 212.4 meters, on the north, 36.4 meters, on the east, 209.3 meters, and on the south, 34.7 meters. It is a structure lined with evidence of water inlet and outlet channels. This dockyard's eastern wall has a 7-meter-wide gap that was used as a spill channel toward the south. The Lothal Dockyard was connected to the Bhogavo river, which led to the Gulf of Cambay. The entire structure has been constructed in such a way that, at high tide, water would amplify the natural flow of the channel and move the additional water downstream. The boats docked at the yard during high tide. When the tide receded, the boats returned. Through the construction of a water spill channel in the dockyard's southern wall, additional water was released. The water flow was controlled by a wooden sluice that was installed across the spill channel. The 260-meter-long wharf ran along the dock's western wall. Goods could be transported to the nearby warehouse from the wharf. The 1,930 square feet of floor space in the warehouse m, making it larger than Harappa and Mohenjodaro's granaries. Sixty-four mud brick blocks, each 3.6 m square and 1 m high, supported the structure on a platform that was 4 m high. In order to facilitate ventilation and easy access to the goods, passages of one meter in width were scattered throughout the blocks. A timber superstructure was raised above the blocks. Similar rock-cut reservoirs were constructed to collect rainwater at Dholavira in the Rann of Kutch. Dholavira is in an area where there is a severe lack of water. The Harappans came up with some very clever ways to divert rainwater from the two rivers near the Dholavira settlement to 16 reservoirs for later use. Rainwater was collected from the catchment areas through the use of the two seasonal rivulets known as Manhar and Mandsar. In order to block the flow of water, stone bunds were erected at strategic points along the rivers. With the assistance of inlet channels, the monsoon runoff was transported to the reservoirs that were dug in the rocky slopes between the inner and outer walls of the settlement. Bund-cum-causeways separated these water reservoirs from one another, making it easier to get to the settlement's various parts. In addition, drains for collecting storm water were constructed throughout the citadel area. Stone and brick were used to construct these drains, which were primarily used for rainwater collection rather than sullage. In a similar vein, soak-pits and house

drains were linked in Dholavira. As a result, every effort was made to harvest rainwater wisely using technology. The management of water at the Harappan sites of Kalibangan, Surkotada, and Chanhudaro also shows how scientific methods were used for everyday purposes. Both public and private wells have been discovered. The drains from well-built bathrooms were connected to the drains in the streets, which were fitted with manholes on a regular basis to make it simple to clean. Tiles were used to cover the kiln-baked bricks that were used to construct the drains. This demonstrates that Harappan sites had a highly developed drainage and sewerage system that became a defining feature of this urban, highly advanced civilization. Irrigation channels, reservoirs, embankments, and wells for water harvesting have been built by a number of dynasties. Along with digging wells for public use alongside roads, the Mauryan rulers also documented the construction of irrigation systems for newly established villages. The Arthashastra of Kautilya is well-known for its information on water harvesting, rainfall patterns, and irrigation practices. A remarkable example of hydraulic engineering is a tank that was built in the first century BCE near Allahabad at the site of Sringaverapura. It is a huge tank that is over 250 meters long. It was constructed by damming the Ganga, which during monsoons spills into a nearby stream (nullah), where a canal that is 11 meters wide and 5 meters deep transports water to this tank. However, the water is first directed to a settling chamber, where all of the debris and silt settle to the bottom, before the tank is filled with clean water. This water is used in rituals and as a bath. The tank never goes dry due to underground wells at the base which draw water from ground level. Another reservoir, the Sudarshana lake, was an impressive structure that can be mentioned here. It was in the Girnar region of Gujarat and dates back to the third century BCE. Pusyagupta, a functionary, was the first person to dig this up during Chandragupta Maurya's reign. Yavanraja Tushaspha added additional channels while Ashoka was in charge. The Shaka king Mahakshatrapa Rudradaman of Ujjain was the one who restored the lake after it had been damaged for four centuries. This is mentioned in the Girnar Junagadh Inscription from 150 CE. An inscription from Skanda Gupta's reign in 455 CE demonstrates that the lake remained in existence well into the ensuing era. According to the record, Chakrapalit, the local city governor and the son of Parnadatta, the provincial governor of Skanda Gupta, fixed the lake when the embankment broke. At the lake's base, the embankment was 100 feet thick at this time. In the 9th century CE, the lake finally broke through, and nothing was done to fix it.

Counterpoised "sweeps" or other devices lifted water from the lake and fed it into smaller channels.

The Bhagavad Gita, Abhigyan Shakuntalam, And The Ramayana

Hastinapur, Kurus' capital, is described in the Mahabharata as being in a forest. It also said that the kingdoms of Kurus and Panchalas, which roughly covered the upper Gangetic plains, were in forested areas. The nine sacred forests mentioned in Devipurana included Kuru jungle, Nimisha, and Utpalaranya, which covered the upper Ganga plains. Pinus, Dalbergia, Holorabera, and other plants were found in pollen records from the Hastinapur excavations. The Pandavas were required to construct Indraprastha as their capital when they were given half the kingdom. To accomplish this, the forests needed to be cut down, and the god Agni set fire to the forest. Arjuna and Krishna went to Khandava forest, which was on the Yamuna bank near where Delhi is now. Because Brahmans played a crucial role in colonization, Agni's appearance as a Brahman begging for money was significant. When the prince of Ayodhya was about to embark on his lengthy exile in the forests south of the Gangetic plains, his mother Kaushalya expressed concern about his safety: My dear son, may the enormous elephants, lions, tigers, bears, boars, and ferocious horned buffalo not harm you. Sita enjoyed spending time in the wooded areas. Reference of lotus lakes, geese, ducks, honey-scented forests, groups of deer were found. They first sacrificed a blackbuck, one of the species that is currently in danger of extinction, when building their home in the forest. Lakshmana ensured that the animal was killed but left with its limbs intact so that they could be cooked, broiled, and offered to god later. The krisnasara antelope had long served as a symbol for the open spaces and dry, cereal-bearing culture. The land of the black antelope and Aryavartya, home to the Aryans, frequently shared a border. These were regions that were located to the north of the Vindhya mountain range. Arjuna (Terminalia arujuna), Jupa Puspa or Karnikar (Hibiscus mutabilis/Hibiscus rosasinensis), and other characters were described in the Ramayana. were Sita's favorite trees. Sala (Shorea robusta), Asoka (Saraca indica), Champa (Michelia champaca), and other plants were found in the Asoka Garden of Ravana. The Chandan or Sandal Wood trees (Santalum album) were extremely popular at the time. The ecology of certain regions has changed as a result of centuries of gradual forest clearing. The rate of change varied widely. In the past, it took longer and covered a smaller area. However, as demand for land increased, the process of clearing forests accelerated and expanded. In the Abhigyan Shakuntalam, Dusyanta went on a hunt with a large

group of warriors, killing elephants, tigers, and herds of deer without discrimination. The settlement's inhabitants were demonstrating their control over the natural world. Through ashrama life, the play also demonstrated how close man is to the forests. Shakuntala was very close to the plants and deer in the forest, which was used as a place of peace and gentleness. To make the forest life more relatable, Kalidasa romanticized it. Small clusters of forests dedicated to local deities are known as sacred groves. They occur frequently in many parts of the country, particularly in the Western Ghats and the north-eastern regions. The village god or goddess is said to hold these dark patches of evergreen forest sacred, and they have been there since time immemorial. Many of them are home to vegetation of the climax level as well as uncommon and little-known species of plants. In addition to safeguarding the ecology of the area, sacred groves provide the village communities with dry fuel wood, dried leaves, and a wide variety of non-wood products. Over 10,000 sacred groves were found in India, according to some previous studies. Rare, endemic, and endangered organisms are kept in these forest patches by huge trees and giant climbers. There were sacred groves in the ancient cities of Vaisali, Kushinaraand, and Champa. The groves are frequently described as being made up of particular kinds of trees, like the Banyan or the Sala, so it's possible that they were planted in a particular way. In keeping with the traditional pattern of Hindu India, Vrajbhumi, the region surrounding Vrindavana, has always had a very good environmental balance. Throughout the ages, the concept of sacred groves was emphasized in numerous ancient Indian texts. In the Bhagavad Gita, Krishna compared the world to a single banyan tree with infinite branches through which all animals, humans, and demigods roam. This analogy exemplifies the idea of community ecology. Keystone resources include the Banyan and Peepal trees, which are widely protected in Asia and Africa and were frequently mentioned in history. The fertility cult of pastoralists, peasants, and those of lower social status among urbanites continued to include the worship of trees. A vaishnava scholar named Srivastava Goswami referred to Krishna's life as "the greatest chapter in environmental history." According to Goswami, Krishna only performed formal religious worship twice, and on both occasions, he worshiped nature. According to Krishna, all living things are born, die, and experience pleasure and suffering as a result of karma; Because everyone has the ability to control its own destiny, there is no need to worship Indra, the water god. "Your environment is your concern, it is your duty," he added. Krishna taught that it was preferable to worship cows, hills, and forests rather than demigods. Krishna cleansed the Yamuna River and defeated the

serpent kalya. To safeguard the forest, he swallowed the fire. The cows were in his care. He conversed with the birds in their native tongue. He always took care of nature. Brindavan's trees were praised by Krishna: They have devoted their lives to helping other people. Individually, they are putting up with any and all natural disturbances. They provide human society with a variety of amenities, including leaves, flowers, fruits, shade, roots, bark, flavor extracts, and fuels. Vrindavana's groves of sacred kadamba, papal, tamal, amalaki, and vata used to be famous, but they are now almost all gone. According to Srimad Bhagavatam, the environment was also very pleasant: Krishna brought the cows forward and played on his flute through the Vrindavana forest, which was full of vegetables, flowers, and pasturing grass with fruits, flowers, and bees. There were chirping birds and lakes with clear water. Constant sweet-smelling breezes refreshed the mind and body. In the Vedic literature, a lot of stories show how people from the outside world interact with sages in their forest ashramas. The Vedic teachings of the Upanishads, such as the Brihad-Aranyaka, which translates to "the teaching which began in the forests," and the Sanskrit concept of vanavaibhava, which refers to the beauty of natural creation, emerged from this profoundly natural setting. It could be argued that the idea that culture was suppressing nature led to the romanticization of the forest. For a man during the time of Sanyas and Banaprastha, the forest was a way to shed the mask of civilization and discover one's own identity. Cultural ties to ecological differences are well-known in some literary subgenres. As a result, the Tinnai concept of Tamil Sangam texts, written around the beginning of the Christian era, is a fascinating example of an in-depth and early understanding of the significance of eco-zones. There were five distinct eco-zones in the landscape, all of which were connected to the social and cultural fabric of society. The littoral, wetlands, pastoral lands, dry zones, and hilly backwoods were listed as the zones. Fishing and salt making were important in the coastal areas; rice cultivation in the wetlands; livestock breeding and shifting cultivation in the pastoral tracts; cattle were taken from those who lived in the dry zones; and backwoods life was associated with hunting and gathering. When compared to the tracts that were not cultivable, wetlands had a very small amount, but this changed over time. At the exchange centers, paddy and salt were traded for other goods, resulting in some interactions. The process by which these micro eco-zones grew into macro-zones over time has been the subject of some historical studies.

Conclusions

The preceding discussion of the environment demonstrates that ancient Indians were extremely concerned about the environment's sustainability and preservation. The ancient Indian literature of the Vedas, Manusmriti, Ramayana, Mahabharata, and Puranas is replete with references that emphasize the profound significance that humans placed on their environment. The concepts of forest ecology and sustainable conservation are reflected in ancient Indian texts like the Arthashastra, Sathapatha Brahamana, Vedas, Manusmrti, Brhat-Samhita, Ramayana, Mahabharata, and Rajatarangini. The environment has been significantly altered as a result of human civilization and development. Environmental degradation has prompted unsettling concerns regarding the idea of development itself. A large number of people have been marginalized as a result of environmental degradation, and their lives and means of subsistence have been seriously questioned. As anticipated, development has degraded and depleted natural resources simultaneously, but it has also increased consumerism in a small segment of society. Securing the right to conserve food, water, air, and all other natural resources, in particular, as well as the environment as a whole, is urgently required. There is a growing trend of consciousness among us to address the emerging environmental and ecological issues facing modern civilized societies. Many environmental protection policies are being developed in a variety of nations; however, all of them are directly or indirectly dependent on ancient wisdom that teaches us the value of a simple life. We can adhere to the straightforward policies of our ancestors, who probably had a much deeper comprehension of the environment than we do today. In order to achieve a more stable, clean, rich, and healthy environment in the near future, comprehensive studies are urgently required to extract, analyze, and implement the ancient Indian environmental and ecological conservation policies in contemporary societies.

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