

Development of forestry in India Until the 21st century

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Abstract

This paper reviews stages of forestry development in India from ancient time to contemporary scenario. Roots of forestry science developments took place in India around 1800 B.C. In the beginning of civilization, forests' role was only for human use like agriculture and some medicinal uses. Our religious texts like Aranyakas, puranas and Vedas do mention uses, Administration and classification, of forest resources. Scientific management of the forest resources was not in practice before the Britishers' rule in India. The forest resources were managed by the associated emperor and the local community primarily for timber, fuel wood and fodder collection. During that era, the large areas of the forest were deforested for exporting timber from the country. During that period, the forest policy and forest act were formulated, which provide more emphasis on the revenue collection and less on the conservation aspects. In the beginning of 19th Century Britishers realized the need of protection, conservation and management to fulfill their future requirements of forest resources. The British government was a pioneer in scientific management of the forestry resources by providing training supported by researchers. After the Independence of the Country in 1947, the National Forest Policy was revised in 1952, 1988, with more emphasis on research, conservation and social forestry. Conclusively India's forestry journey reflects a shift from exploitation to conservation and sustainable management, balancing ecological needs with socio-economic development.

Keywords: Evolution, Stages, Exploitation, Scientific management, Transformations

Introduction

Despite the prevailing notion that forestry as a science and practice originated in the Western Europe and further advanced in North America (Lewis, 2005). The principles of forest conservation and sustainable forest management were entrenched in Ancient India (Kumar, 2008). About 2000 B.C. the Aryan invaders entered through the north-western passes into India. Habitants residing in between the Ganges and Yamuna river slash and burn dense forests for the purpose of cultivation. Migration of people increased rapidly from central Asia to these fertile plains. Alexander and his troops' movement was concealed by these dense forests during the invasion of the North Punjab area in 326 B.C. Beginning of 11th century A.D. forest area shrank in India, Persia, Asia Minor and the Mediterranean Countries. The *Muslims* were not

religious with fear and belief against forest destruction and exported valuable wood to Arabic and Persian countries. Emergence of teak for shipbuilding leads to its exploitation for commercial wood. In 1599, Queen Elizabeth I of England sent two hundred gentleman-merchants and other individuals to India for trade in India. In the beginning of the eighteenth century power of the Mogul Empires got declined. Political supremacy in the Indian subcontinent was with the East India Company (**Kumar, 2008**). Till then forest was always a source of revenue globally and in the Indian subcontinent till 18th century.

Forestry education was first started at 'Master Schools' in Germany in 1763 and the first forestry school was established in Austria (**Fernow, 1913**.) The laying stone of Forest Ranger School in Dehradun was laid by D. Brandis in 1878 was a first step for education and research. From India professional forestry spread to many parts of the world. The "Indian Forester" created by Dr. William Schlich 1875 is one of the famous papers for Tropic Forestry. However, in India, the concern about the forestry sector for education, research and management was focused after massive deforestation occurred during the British Empire, when large mass of forest land has been deforested for other than non-forestry purposes (**Haeuber, 1993**). In tracing the chronology of forestry development in India, it is obvious that the relationship between humans and forests has undergone dynamic shifts. Based on that, the forestry development in India has also been classified into four classes in synergy with the development of world forest resources (**Kimmins, 1997**).

Phases of development	Issue	Output
Pre-forestry	Exploitation	Resource diminution
Forestry Phase 1 Conservation	Administration based forestry	Failure to accomplish and sustainability goals
Forestry Phase 2 timber and conventional	Ecological based forestry forest	Prolong production of area
Forestry Phase 3	Social forestry	Ecological based forestry that sustains wide range of forest conditions and values desired by society

(Source: J.P. Kimmins, 1997)

Pre-forestry

The forest played a key role in early Indian literature, usually presented in opposition to settled society. In early stages of development, the trees from the forests and other land uses were cut for human use. The high dependency on such resources of the community during the time was primarily due to lack of technologies and improper means of cultivation. However during that time, the loss of forests was not so apparent due to low human population and vast forest resources (**Tewari, 1993**). With increasing human population, supplemented by technologies lead to unregulated forest removals, and resulted in either complete loss of vegetation i.e. deforestation or degradation of the forests (**Haeuber, 1993**). These supplemented by awareness regarding the use and value of forestry resources across the world initiated and invited the concept of protection and conservation of the forests. The timeline in this regards, is being provided in the following table for better insight.

Period	Developmental Stages
Vedic (1800 B.C.)	The importance of the forest resources were highlighted in Vedas. During the period, rishis identified the various medicinal and poisonous plants (<i>Oshadhi</i>) to cure the various types of ailments from plant product.
1500 B.C.	<p>In Ramayana and Mahabharata there is description of various types of forest.</p> <p>In Vishnupuran, there are 13 types of forest occurring in different parts of the country. These forests were further divided into two main classes:</p> <p>i. Kunjar Vana (means elephant as dense forest) ii. Katak Vana (means thorny scrub forest)</p>
Maurya (321-185 B.C)	<p>According to “Kautilya’s Arthasasthra” the forest were classified into 4 categories</p> <p>i. Reserved forest for the king ii. Forest donated to eminent Brahmins</p> <p>iii. Reserve forest for the state iv. Forest for public</p>
Gupta (320-550)	Due to fragmentation of forest states and infighting among the emperors, destruction of forests occurred.
Mughal (1500-1750)	Forest land was cleared for agriculture.

(**Dwivedi, 2006**).

Forestry Phase1

In the beginning of 19th **Century Britishers realized the need of protection, conservation and management** to fulfill their future requirements of forest resources because heavy forest loss was taking place resulting from heavy forest exploration. The first stage of forestry primarily focused on formulating a set of laws and regulations which lacked compassion to ecological differences among diverse forest ecosystems. It almost failed to achieve the intended

objectives of the development of the forests. **This stage has generally focused on forest removals for industrial and military supplies with low emphasis and concern for wildlife and forest protection.**

The settlement of rights in the reserved and protected forests by the forest departments was a primary goal of forest departments later in the 19th century. **The Working Plan's concept was also envisaged** and applied to the majority of the forest areas and significant tree species (Negi, 2006). This facilitates scientific management and development of forests. For resource generation diverse silvicultural systems were developed to harvest and regenerate substantial timber species. Though sufficient concern on the ecological consequences of such management practices was not undertaken due to lack of knowledge and awareness about the issue.

Year	Major Accomplishment
1800	Forestry Commission was appointed to suggest regulation prohibiting felling of young teak forest of Malabar District.
1806	Appointment of Police Officer Mr. Watson as Conservator of Forests by the British Government for organizing exploitation of forest.
1842	First Teak plantation initiated by Mr. Conolly at Malabar in order to supply the future demand of teak timber.
1854	Superintendent of Forest Dr Mc Clelland (Pegu) submitted the report to Govt. of India suggesting restrictions on exploitation of forest by private persons.
1855	Lord Dalhousie (British Governor General of India) framed out Dr Mc Clelland's report.
1864	Foundation of Scientific Forestry was laid out. Appointment of Sir. Dietrich Brandis (Father of Indian Forestry) as first Inspector General of Forest.
1865	First Forest Act was formulated.
1867	Imperial Forest Service was organized under the Imperial Forest Department.
1874	Book on "Forest flora of North West & Central India" by Dietrich Brandis
1875	Monthly journal "Indian Forester" publication started,
1878	<ul style="list-style-type: none"> Forest School at Dehradun was started for providing training to the foresters. Amendment of Indian Forest Act 1865, monopoly of State Government was recognized and the forest was classified into Reserved forest and Protected forest. In Reserve forest the public had no rights while in protected forest they could exercise some rights. (Negi, 2006)
1881	Manual of Indian Timbers by J. S. Gamble

1882	A separate forest Act “Madras Forest Act” was passed. Under this act, Reserve forests were divided into two categories; 1. Major Forest (British Government). 2. Minor Forest (Van Panchayat).
1883	Bombay Natural History Society (BNHS) was established with an objective for conservation and biodiversity research.
1884	Forest School renamed as Imperial Forest School.
1890	Dr Voelcker started to study Indian Agriculture problems.
1894	Based on Dr Voelcker’s study first “Indian Forest Policy” was passed.
1906	Establishment of Forest Research Institute (FRI) at Dehradun. (Bhatt, 2005)
1914	The Destructive Insect Pest Act (DIPA) was passed.
1920	Centralization of the IFS probationers training at FRI in Dehradun.

Forestry Phase 2

Heavy destruction of forests lead to ecological disturbances, therefore, efforts were made to check the destruction and create a balance between the resource extraction and legal demand. Therefore, protection and conservation forestry coupled with the ecological based forestry practices were introduced through classifying the forest into reserve, protected and village forests, keeping in view that ecological based forestry will flourish in the functional process of the ecosystem (**Manikanandan, 2011**). Emphasis was also made to inventorisation of forest resources and their **scientific management through establishing the national parks**. The scientific aspects of some issues of forestry were also brought into main focus by **institutionalizing the forestry research**.

The large-scale developmental activities after independence keeping in view of the demand of the country lead to hasty industrialization (including paper, plywood, saw milling) and extension of railways, which resulted in unsustainable harvesting of trees and ultimately degraded and deforested the existing forests (**Guha, 1983**). The large areas of forests were converted into non-forestry purposes for “grow more food” campaigns, river valley projects etc. These all unsustainable activities were responsible for forest exploitation and therefore forests were degraded and deforested at massive scale.

Year	Major Accomplishment
1927	The Indian Forest Act was passed. This Act contains 13 chapters and 86 sections. This act classifies the forest into reserve forest, protected forest and village forest.
1929	The IFRI building was constructed in Dehradun.

1935	With the Government of India Act (1935), forests became entirely the concern of the provinces, although the central government continued to
	provide technical guidance and advice
1936	Establishment of First National Park named Saint Hailey National Park (later renamed as Jim Corbett N.P.) under United Provinces National Park Bill.
1938	With decentralization to the provincial level, the IFS training was abolished. The Indian Forest College (IFC) was established in 1938 in Dehradun. The mandate of the IFC was to provide the training college for the newly recruited foresters of the State Forest Services (Kulkarni, 1963).
1947	Import and Export Control Act passed for timber trade for general purpose.
1948	Imperial Forest College handed over to the Govt. of India.
1950	Van Mahotsav (Tree Planting Festival) started by Shri K.M Munshi, Former Union Agriculture Minister.
1950-51	The recorded forest area was 40.48 million ha.
1952	Indian Forest Policy was passed with the aim of to cover 33% of the total geographical area. The Indian Board of Wildlife was established.
1957	Logging branch of Forestry was established at F.R.I., Dehradun.
1962	Seed Testing started in F.R.I Dehradun.
1963	First Aerial Survey of Kullu Forest (in Himanchal Pradesh) was conducted by G. A. Jones for inventorisation of forestry resources.
1968	Champion and Seth published a book containing the classification, identification and description of 16 forest types of India.

Forestry Phase 3

The **final stage of forestry led to the evolution of social forestry**. Social forestry was introduced keeping in view the importance of forests for the society and role of society for protection of the forests. This was with the approach that balance may be created between the demand and production of forestry resources. The varied role of the forestry sector after independence demanded diversified function from forestry professionals for conventional forest protection production & bio-diversity conservation. Therefore, **stakeholder participation becomes critical for sustainable forest management and the essence of this is included in the National Forest Policy 1988 (Champion, 2008)**.

India recognizes the contribution of forestry and therefore amended the Constitution to include forestry under concurrent list. Besides this, India Constitution has also passed various articles in relation to the forests.

Article 48-A stated, “The State shall endeavor to protect and improve the environment and safeguard the forests and wildlife of the country”.

Article 51- A stated “to protect and improve the natural environment including forest, lakes, rivers and wildlife, and to have compassion for living creatures”. (**Raj and Lal, 2013**)

The 73rd and 74th Constitutional amendments authorized Panchayats and Urban local bodies for promotion of social forestry and urban forestry on vacant lands.

Year	Major Accomplishment
1968	Jack Westoby (London) coined the term “Social Forestry”.
1970	<ul style="list-style-type: none"> Social Forestry was started in Gujarat. The National Commission on Agriculture was established.
1971	The Man and Biosphere Program (UNESCO) was started.
1972	<ul style="list-style-type: none"> The Wildlife Protection Act was passed. Project Lion was started for conservation of lions from Gir forest of Gujarat.
1973	<ul style="list-style-type: none"> The Water Conservation Act was passed. Project Tiger was launched for conserving tigers within the country. The Chipko Movement for saving the tree was started (Chamoli, Uttrakhand) by Padam Shree Sundar Lal Bahuguna .
1975	The Crocodile Breeding Management Project was started.
1976	<ul style="list-style-type: none"> India became a member of (CITES). National Commission on Agriculture (NCA) report was published, 7th schedule 42th amendment to constitution. Tree Protection Act was enacted.
1979	First Social Forestry Project was started.
1980	The Forest Conservation Act was passed to conserve the forest resources with complete bans of the logging operations.
1984	First attempt to determine the actual Forest Cover in India by the National Remote Sensing Agency.
1987	After the first attempt of the National Remote Sensing Agency, the Forest Survey of India made a second assessment of forest cover.
1991	Wildlife Protection Act 1972 was amended. Separate Chapter (III) is introduced to regulate exploitation of threatened species and provision for setting up of Central Zoo Authority (CZA).
1992	Project Elephant was started by the Government of India to save the elephants.
2001	Indian Forest Act 1927 was amended.

2002	<ul style="list-style-type: none"> The Biological Diversity Conservation Act was passed. Amendment of Wildlife Protection Act 1972. The basic objectives are: <ul style="list-style-type: none"> i. Setting up of the National Board of Wildlife (NBWL) with the Prime minister as Chairman. ii. Addition to National park and Sanctuaries, the protected area additionally includes Community reserve and Conservation reserve.
2005	The Scheduled Tribes Bill was introduced.
2006	<ul style="list-style-type: none"> The Scheduled Tribes Act was passed for securing the rights of the tribal people.
	<ul style="list-style-type: none"> Amendment of Wildlife Protection act 1972. The act passed the National Tiger Authority on Chapter IVB.
2009	Project Snow Leopard was started for the conservation and management of the snow leopards.
2011	Amendment of Indian Forest Act 1927. The basic objective of this amendment is to check the unnecessary harassment to the tribal people for collecting forest produce from the forest floor because they directly depend on the forest for their livelihood.
2014	National Agroforestry Policy was passed in (Parthiban <i>et al.</i>, 2019)

Way forward

At present India's forestry journey reflects a shift from exploitation to conservation and sustainable management, balancing ecological needs with socio-economic development. India's forestry development has undergone significant transformations in recent years, marked by both advancements and challenges. The stages of this development reflect a dynamic interplay between conservation efforts, community involvement, technological innovations, and environmental pressures. In summary, India's forestry development is characterized by a multifaceted approach that includes expanding green cover, empowering local communities, leveraging technology, and addressing environmental challenges. These efforts aim to create a sustainable and resilient forest ecosystem in the face of evolving socioeconomic and climatic conditions.

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