



## Forest ecology and agriculture in pre-colonial north India

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### Abstract

The Pre-colonial north India in the light of archaeological, literary sources and newly translated material on Mughal India should be re-interrogated in the context of issues like forest, flora and fauna, rivers, climate, plant and mineral wealth. The relationship between ecology and human beings has emerged as one of the central questions in the contemporary world. This question has been historically investigated by environmental historians of India. However, the fact remains, that environmental history writing in India has given more attention to British India. Further, medieval India constituted a less explored domain so far as ecology is concerned. The proposed paper attempts to address this gap by way of focusing on the representation of ecological conditions of India by European travelers of the Mughal period.

The main focus of this paper is to explore the way European traveler depicted environmental conditions such as nature of forest cover, horticultural practices, several animals, and hunting practices at one level. At another level, an attempt has also been made to explore how European travellers depicted the relationship between human beings and ecologically sensitive resources. In brief, an attempt would be made to retrieve the ecological narratives of European traveller in Mughal India. The main objective of this paper is to conceptualize the relationship between man and nature in medieval India in the light of European travel writings.

**Keywords:** forest; ecology; riverine; landscape; animal; hunting and horticulture

### Introduction

Environmental history writing began first in Europe around the twentieth century. Although Italian historians using micro-history and Britons using anthropological social historical methods studied environmental history, the most influential contributions to this field were the French historians, who invented the famous *Annales* approach, drawing on all the social sciences to create what they sometimes called a total history. *Annales* historians, however, did not consider themselves as environmental historians and they did not use the phrase until 1974. Nevertheless, the *Annales* School served as a great source of inspiration to the environment historians of the future (Chakrabarti 2007, p.20).

Environmental history writing took a real shape in the United States, where it grew out of the history of conservation and the environmental movement. This issue has been largely discussed by many American environmental historians- John McNeill and Donald Worster being few prominent among them. McNeill underscores environmental history as one of the historical study's most interdisciplinary fields, which is forcing the scholars to adopt disciplinary techniques spanning the spectrum from archaeology to zoology (McNeill 2003, p.9). In its initial stages, the study of environmental history seemed to be a project to raise public awareness of the environmental crisis defined by researchers, engaged throughout various branches of environmental science and ecology. However, it is increasingly recognized now that the recent environmental crisis calls for the historians to play a new and independent role in developing a new paradigm for the future, including studies of human and environmental experiences and activities; man's important role as both the

creator and the un-maker of nature (Arnold & Guha 1995, p.3).

In the last thirty years, a growing number of historians have written about the changing patterns of cultural and intellectual ideas concerning ecology and the environment. Donald Worster's book *Natures Economy* is perceived as a seminal work in the context of changing ideas of ecology over the past three centuries. He traces the roots of ecological study to eighteenth-century ideas about the value of the natural world. "Two major traditions in ecology emerged in this period. The first was the "arcadian" stance advocating a simple life for a man to restore him to peaceful coexistence with other organisms. The second and imperial tradition sought to establish, through the exercise of reason and hard work, man's dominion over nature (Worster 1997, p.12). These two competing views would form the foundation of Western thought concerning the natural world.

As far as scholarship on South Asian environmental history writing is concerned, it emerged around 1980 as a separate theme from its rather different forms in Europe and North America. At first, their writings largely focused on forest policy, tracing the root of recent controversies back to the early colonial beginnings. But no major studies of environment history have reached back into the pre-British era, as other branches of Indian historiography have done before them- like the writings of B. Ribbentrop's *Forestry in British India* and E.P. Stebbing, his fascinating work on *The Forests of India*.

However, it never means to say that pre-colonial India did not receive the attention of environmental historians. One of the fascinating work *Ecology, Population Distribution and Settlement Pattern in Mughal India, Man and Environment*

in 2008 brought by scholar like Shireen Moosvi and she investigate demographic and settlement patterns during the Mughal period and informs the ecological change since 1600 that can be grasped by computing the extent of cultivation around that time and comparing it with figures of more recent times (Moosvi 2008, p.89). Ellen David Arnoldon, the other hand analyzes medieval environment history as a dynamic and growing field and while it may be rooted in 'older question' of medieval history, it takes advantage of new and exciting sources and methods and explores themes such as climate and ecological history, the history of agriculture and water, landscape, and religious studies (Arnold 2008, p.898-916).

Richard Eaton in his articles and subsequently in his books asserted that the so-called "traditional pre-modern" societies or medieval ecologies were never static but marked by human adaptations to change. Small, often unnoticed innovation and changes gradually improved human life and productivity (Eaton, 1998) <sup>[1]</sup>. In the views of Madhav Gadgil and Ramchandra Guha, the pre-industrial or pre-colonial past may not have been as idyllic, harmonious or benevolent as some have argued (Gadgil & Guha, 1993), ecological systems were transient, uncertain, and constantly changing although all transmutations may not have been contributed by human beings, some modification in nature could have been sudden and cataclysmic (Rangarajan & Sivaramakrishnan 2012, p.1, 8).

Focusing on the specificities of geography and ecology in Mughal time Jos Gommans pointed out, it should necessarily be considered since Mughal India has a vast and varied landscape. On the other hand, features like the sea, high slopes, or the desert were never a barrier to human movement across time. This recognizes that the Indian subcontinent was neither sealed off from the world nor devoid of human contact. Therefore, as the scholar observes the human ecological impact on the subcontinent was not as mild as is assumed but probably enhanced by the contact with distant places and people. Further, an attempt has been made by Simon Digby and Jos Gommans in their work entitled *The Supply of War-Horses and The Silent Frontier of South Asia, c 1100-1800* respectively to study issues like animals, war, and conquest and have pointed out that there was nothing fixed about the 'forest line' in Mughals time. However, any shifts in it had consequences not only for the people but also for the animals.

Some studies provided valuable information on the wildlife history of Mughal India. The engagement of the Mughal emperors with fascinating hunting games has received much attention among historians. Sudipta Mitra in his book, *History, and Heritage of Indian Game Hunting* provides graphical details on how the Mughals were engaged in hunting and domesticating various animals (Mitra 2010, p.14). Valmiki Thapar works entitled *Last Tiger* did show the way the Mughal emperors tried to maintain game reserves (Thapar, 2018). Divyabhanusinh, on the other hand, provides pictorial and literary evidence to explain hunting during the Mughal period and reflect on changing human relations. But the fact is that these studies mainly confined the engagement of the Mughal state with game hunting and preservation of game reserves.

The study of Irfan Habib entitled *Agrarian System of Mughal India* throws considerable light on the nature of state intervention in the management of ecologically sensitive resources such as water, land, forest, wildlife,

gardens, etc. (Habib, 1999). In his recent publication *Man and Environment*, Habib provides fascinating details on the ecological dimension of medieval India in general and the Mughal Empire in particular. It has been proposed by him that the Mughal State was seriously engaged in the management of ecologically sensitive resources as those are an important part of resources required for it. In the very illuminating work entitled *Forest, Pastoralist and Agrarian Society in Mughal India* Chetan Singh made the fact that the environment cannot be studied in isolation either can agriculture be seen as exclusive of the other elements of the environment, though it has long been assumed that the prosperity of the Mughal state depended on its agrarian base.

The explicit fact is that the historical study on the environmental history of Mughal India happens to be less in number. Moreover, such studies mainly confined to hunting and games sports of Mughal ruler. Hence the attitude and practice of the Mughal state in harnessing ecology remain a further less explored domain. At the same time, the writings of European travelers have been used to study mainly the court culture of the Mughal Empire. This study proposes that the engagement of the Mughal state and society with ecology is more complicated than the existing document. To document the ecological history of the Mughal state and society we tried to use the writings of Mughal emperors, court historians in general, and European traveler writings in particular. A careful attempt has been made to retrieve the information given by European travelers on the attitude and practices of the Mughal state, society, and culture towards ecologically sensitive resources such as forests, agriculture including soil fertility, and fauna, and flora.

### Forest Ecology

Before the Mughal period, the exact extent of forests on the country map cannot be established. Our knowledge of the geography of the forest cover during the seventeenth century is based mainly on the statistical information on the extension of cultivation in the *Ain-i-Akbari* and subsequent documents (Habib, 2015). The retreat of the forest in the face of the peasant's plow can also be established for different areas from directly contemporary evidence about forests where they no longer exist. Abul Fazal in his description of the geography of the provinces of Akbar's Empire gives an account of the forests as well. Other Mughal historians often mention forests in their accounts of the geography of the regions where Mughal arms penetrated. On the other hand, traveler records have constituted an important source for the study of the Mughal forest cover.

Jean-Baptiste Tavernier had documented a dense forest cover in the northern town of Gorakhpur *suba* in his account *Travels in India 1640-67* (Tavernier 1889, p. 205). On the way to Awadh *Suba*, British traveller Peter Mundy gave a detailed description of the forest cover of Jaunpur and the Allahabad region in his account (Mundy 1907, p. 119). Focusing on the Agra region of Mughal *suba*, Dutch traveller Francisco Pelsaert, pointed out that the region had a great shortage of firewood, and trees were scarce because the ground was salty and for this reason, all fruits were imported from Kandhar or Kabul (Pelsaert 1925, p.48). Information regarding the forest cover of Bihar comes from Bernier who noticed a tract of forest to the northeast of three sarkars of Munger (Bernier 1891, p.80). In 1622, Peter

Mundy noticed large forest areas between Sasaram, Sherpur and Makrain. However, by the end of the seventeenth century were transformed into agricultural land (Bernier 1891, p.133). Tavernier further described dense forest cover in Gorakhpursarkar (East, U.P.) by the mid-seventeenth century and that region has continued to be known for its dense forest cover by the end of the eighteenth century (Tavernier 1925, p.48). Evidence regarding herds of wild elephants stretching from Bihar and Orissa to Malwa and further west to the borders of Gujarat, that areas have been designated by Irfan Habib as the 'Great Central India Forest' cover (Habib 1982, 4B, 8B, 11B, 13B, 16B). Thus wild animal possibly is significant to trace the tract of forest cover along with the encroachment of forest for making agricultural land.

The impact of this immense change in the extent of forest and grassland has naturally had far-reaching consequences for not only the economy but also degrading ecological balances. The much large extent of forest in Mughal times must have provided certain important products. First, there was a large supply of timber for construction and shipbuilding, firewood, charcoal, gum lac, and tasar silk. Second, animals such as wild elephants were economically important when caught not only as war animals but also as beasts of burden. Cheetahs were caught and trained to hunt deer and were much in demand from the Imperial Court and the aristocracy (Moosvi 2008, p.95).

## Biodiversity

### ▪ Faunal diversity

Though, there are two important sources where we get a large quantum of references on the topic under study- the *Baburnama* and *Tuzuk-i-Jahangiri*. Both Babur and Jahangir have much affection for flora and fauna and their memoirs are replete with information regarding them. Moreover, European accounts have given additional information on the wildlife history of the Mughal Empire along with the forest cover. However, hunting wild animals and birds was a common narrative mainly reflected in most European travel writings. Fransico Pelsaert mentioned the pleasures of the game of hunting thus "Hunting with leopard is a remarkable form of sport". He also refers to Jahangir's interest in lion hunting and says that the Emperor, while young preferred shooting to all other forms of sport (Pelsaert 1972, p.51). Niccolao Manucci was an Italian traveler and has given very fascinating details in *Storiado Mogor 1656-72* (Manucci 1907-8, p.91) about the reign of Shahjahan. He recorded Shahjahan's tiger hunting with the help of buffaloes and elephants. Aurangzeb also enjoyed hunting very much. Bernier refers to the Emperor's keen interest in the hunting of lions; cheetah, antelopes, blue bull or gray oxen, and other wild animals, in the company of the high nobles and sometimes, even the commoners (Bernier 1907, p.375-79).

Thus, we can understand from above the statement that hunting wild animals were predominant in the Mughal era. Moreover, the fighting between animals of different varieties was another interesting description of European travelers. Since the common man could not afford to maintain elephants, lions, leopards, or tigers, he had to be satisfied with the less expensive fighting of goats, rams, cocks, stags, antelopes (Thevenot 1949, p.375-79), dogs, birds, bears, buffaloes, bull and blackbuck fights as was common then.

### ▪ Plant diversity

India has been always been a land of the natural plantation. The topography or the geographical condition and its climatic changes have been very favorable for the growth of plants and trees which are great sources of herbs and medicines. On the other hand, the soil, water resources, rain, and other natural occurrences provided a much stronger environment for the growth of natural plants in India. European travelers have discussed in great detail different variety of plants, fruits plant, flowers plant, medicinal plants, and many others plants. Here, we first began to emphasize fruits as well as flower plants. Manucci has recorded in his memoir *Storia do Mogor* that Jahangir was not only an enthusiastic planter but also a natural lover of fruits and flowers. It is said that he used to pluck and gather the fruits by his hand. Shahjahan often used to go to the garden inside the fortress early in the morning to gather the fruits into the company of his favorite nobles (Manucci 1907, p.199).

Describing the fertility of soils in the Agra region, Pelsaert argued, trees and other plants are plentiful around the city, but very scarce in the open country, even four or five trees usually mark the site of a village. Fruit trees were still scarcer, because the ground was salty, and all fruits came from Kandahar or Kabul- no apples, pears, quinces, melons and filberts, and many other kinds. Further, Pelsaert mentioned the emperors and their nobles and other 'great and wealthy people like merchants who also planted fruits in their gardens with imported seed from Persia' (Pelsaert & Bernier, p.48, p.250). Pietro Dell Valle, another important Italian traveler of the seventeenth century, made an interesting fact in his account about the Portuguese who introduced other fruits plant-like papaya and cashew-nut from Brazil or New Spain (Valle 1982, p.134-35). Portuguese also started grafting on mango trees on the western coast where Manucci noticed '*alfonso*' mango on the coast of Goa.

Thus, Mughalshah had a great passion for planting flower plants in their garden and fortress. Jahangir has recorded in *Tuzuk*, that plants like Champa, Jasmine, Rose, and Anemones were planted in the gardens of Gujarat (Manucci 1907, p.68). Manucci has given further description about the best quality of Jasmine flower been planted in the hill gardens Gwalior. Though the main concern of planting flowers in the garden was to enhance the beauty of the garden and spreading fragrance, the flowers of the gardens were used for making rose water and perfumes as well. Manucci tell that three principal imperial abodes of Mughal Empire- Delhi, Agra, and Lahore were full of palaces with gardens, filled with flowers, according to the season. Chiefly rose was grown in winter, from which essence was distilled for the royal household.

For the growth of fruits trees and other plants in Deccan, Jahangir wrote in his biography *Tuzu-i-Jahangir*, "Climate and soil played a significant role. For example, the abundance of fruit trees and other shady trees in the garden of Muqarrab Khan (commander in Golconda), from *wilayat* (Persian and Central Asia) like cypress and pistachio and indigenous like mangoes brought from Deccan and Gujarat, was its good climate (*khushab-o-hawa*) and fertile soil (*shaistagizamin*)".

### Agro-ecology: A Historical Study

The Indian economy during the seventeenth century was predominantly agrarian. Although other occupations were also prevalent agriculture dominated amongst all occupations, which is confirmed by almost all European travelers and other contemporary sources also.

The output of agriculture production depends mainly on the fertility of soil anywhere. The fertility of Indian soil is very popular in the minds of the foreigners and they never missed the chance to tell this fact about Indian soil. The fertility of Bengal (Laval 2002, p.327), Deccan (Laval 2002, p.136s), and Sindh (Van 1988, p.55), and Surat, the soil was recorded by almost all the travelers. The Deccan soil is fertile throughout, being watered by many rivers and streams (Foster 1921, p.296). The Malabar Coast is a good country, fertile and salubrious, and supplies much wealth and commodities to Goa and other parts. Exceptionally, the soil of Goa was found to be unproductive because of its geography. The fertility of Bengal was also recorded during the reign of Shahjahan by Francois Bernier. This fertility was due to the climate which was found to be very good and healthy and in abundance in India for cultivation.

The fertility of the soil was the major factor that led to the abundance of food grains throughout the period. This abundance was appreciated by almost every traveler. Due to abundance, the food grain was very cheap. Abbe Carre wrote about the cheapness of food at Madras, Surat, Goa, Bijapur, Golconda, and Bombay in 1672-74. He writes, "food is very cheap: five pounds of rice for 3 sales (3<sup>rd</sup>.) I Say, rice because it is the principal food of these people, as wheat is in Europe".

Thus, the fertility of soils was a major factor behind more agricultural production as depicted by the contemporary traveler. However, the fact is that agriculture was and continues to be the single most important means by which mankind changed the land and ecosystems (Bhargava 2007, p.22). It represents a connecting point between the human powers that organize agriculture and the changing natural environment and is a major element of ecological transformation in human history, for no occupation other than farming alters the land so much.

### Epilogue

As evidently, is seen in the account of the contemporary European travelers- although the social, political, and cultural condition of Mughal India has constituted their main narrative. However, they have also documented the topographical significance of the seventeenth century as well. Wildlife, hunting, gardens, plants, fertility of soils, rivers, and climate are their main observations and make it verses into their travel records. In *Travels in India*, one of the accounts of Tavernier mentioned the course of the river Ganga while he traveled along the Ganges from Patna to Rajmahal. About gardens of the Mughal period, Pelsaert said that the gardens were an integral part of the Mughal culture, and the toll of city planning and landscaping and gardens played a very significant role in maintaining ecological balances. In contrast, François Bernier elucidated the best quality of watermelon was grown in the gardens of Delhi by imported seeds. Thus, melons had been a nostalgic fruit for the Mughals since they connected them with their ancestral lands. William Finch in his account of *Early Travels* mentioned that "Jahangir says that there was much difference in the climate of India but Lahore lies in between

Persia and Hindustan which means having the moderate climate. Hence, gardens of Lahore produced sweet and fine flavored mulberries, apples, pomegranates, peaches, and almonds."

About the hunting of wild animals and birds, travelers have given very fascinating details of hunting expeditions undertaken by kings and courtiers. Pelsaert mentioned the pleasure of the game of hunting, hunting with the leopard was a remarkable form of sport in the seventeenth century. Bernier refers to the hunting of lions, cheetah, antelopes and blue bull were favorite animals of Aurangzeb.

Hence, it can be concluded that the accounts of the European travelers help to re interpret the Mughal Indian from an ecological point of view and these traveler accounts have formed an inseparable element of historical material supporting the edifice of Indian society and culture. Without travelogues many facets of Indian history would have remained shady and obscure, it is with this important class of source material that we measure the multiplex environment condition of Mughal India.

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