



Rich and Diverse Agrarian Landscapes and Ecology in the Seventeenth Century of India

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ABSTRACT

Indian agriculture has its distinct ecosystem, which is largely controlled by soil, climate, monsoon, irrigation, and other factors. European travellers visiting India have praised the Indian agricultural system and the fertility of the soil. Everywhere, from North to South, West to East, visitors found an advanced agricultural system; they saw Indian farmers growing a variety of grains, fruits, vegetables, pulses, and cash crops in abundance. The travellers were surprised to see the high fertility of soil, dense forests, a variety of fruits, flowers, vegetables, and wild and domestic animals, all of which were directly and indirectly dependent on agriculture.

Keywords: Forests, Landscapes, Agrarian, Fuel, Firewood, Monsoon

Many scholars like Irfan Habib, Shireen Moosavi, Chetan Singh, etc. have written about the ecosystem of Indian agriculture. They agreed that the Mughals promoted the expansion of agriculture. Agriculture expanded even in those regions where, earlier, there were dense forests. Irfan Habib pointed out, "By the seventeenth century, due to the emergence of new settlements, agricultural expansion in the Ganga Doab was taking place on forest land."¹ Shireen Moosvi estimated that "during Akbar's time, about one-third of the total area was cultivated."² When the Mughals donated any land to someone, the recipient also had rights over all the forests, trees, ponds, etc., falling under that land. It is worth noting that the land donated was often barren. The administrator expected that the donor would convert this barren land into cultivable land and that the state would earn income from it. By reducing taxes, the state encouraged converting land into agricultural land.

It appears that the Mughals were encouraging the conservation of forests. By that time, a good balance was being established between forests and agriculture. Both the Mughals and the local kings were well aware of their importance. Therefore, they tried to expand agriculture, but on the other hand, they also tried to protect the forests in various ways. They had a large income from farming and from the forests; they got elephants, firewood, and other medicines. Apart from this, despite the huge expansion of agriculture, there was more land under forests. Deforestation was taking place only for agriculture, and agriculture was expanding only in the plains or valleys. Mountains, marshlands, and remote forests were still untouched.

Indian agricultural production was so high that it was not only bearing the economic burden of the Indian states but was also comfortably feeding a huge population. Agriculture was simultaneously expanding, but at the same time, intensive farming was also being done. The soil in most areas of the country was so fertile that people rarely had to apply fertiliser to their fields. Monsoons, rivers, water streams, forests, etc., made the soil of this country moist and fertile. European travellers had recognised this speciality of the Indian land. Thomas Bowre describes the geographical topography of the countries around the Bay of Bengal from 1669 to 1679. He says that Bengal has many big and small rivers, beautiful gardens and groves, forests, and abundant wild animals. Edward Terry visited India in the seventeenth century and praised the land for its variety of trees. They say that this is the most vast and fertile land. He further writes that the fertility of the soil produces abundant fruits, flowers, crops, and wood. John Fryer also mentions that wheat and fruits are in abundance in India, and the people of India grow two crops annually. He further writes that the soil here is fertile even without human effort. William Boltz, a Dutch traveller who visited Calcutta in the 18th century, "shared his experience in Indian affairs and praised the fertility of the Indian soil. He writes that India, especially Bengal, produces many fruits and crops. The excellent water, fertile soil, and abundant rainfall in Bengal are not found anywhere in any other country". François Bernier, a famous French traveller, found that a large part of the land in Hindustan was highly fertile. He said "The vast area of the country was the largest in the history of which empire? India produces, and farming is done in every part of India, whether it is sandy, barren, or hilly' But at the same time, he also talks about the political exploitation of farmers. He says that due to excessive

exploitation, fewer people did farming, and due to a large labour shortage, part of the good land remains vacant.³ Comparing Bengal and Egypt, he writes that 'Bengal not only surpasses Egypt in the production of rice, maize and other necessities of life but also produces many crops which are not grown in Egypt such as silk, cotton, and indigo are exported from here in abundance. He further said that there are many parts of India where the population is quite abundant and the land is also quite well cultivated.'⁴ Francisco Pelsart also praised the fertility of the soil, saying that 'the soil of this country is very fertile, and produces vast quantities of grain, such as wheat or rice, sugar, and butter, which are transported in large quantities to other countries by the Yamuna River. It is sent to this country and is transported by land by oxen to provide grain to the king's army.'⁵

Edward Terry describes it in much the same way. He explains the reasons for the prosperity of the Mughal Empire as 'the Mughal possessed vast territory which was very rich and fertile'. He says that all the necessary things for man's use were so abundant that he was able to sustain everyone. This country flourishes on its own without the slightest help from any neighbour.'⁶ He further writes that in the land here, various types of grains like wheat, rice, and barley are cultivated to make bread in abundance. ⁷ According to him, apart from grains, there are also large numbers of sheep, goats, buffaloes, and cows due to which people also have other good provisions like butter, milk, and cheese in abundance. He states that indigo and cotton are the two major crops here, and silk is the next important crop of this empire. Jameli Keriri states that Hindustan abounds in rice, excellent types of wheat and grains of all kinds, vast herds of cattle, butter, and cheese.'⁸

Indian spices attracted European travellers the most. Many travellers have said that many spices like cardamom, ginger, black pepper, nutmeg, mace, clove cinnamon, etc. are cultivated in abundance in India. Gemelli Carriri states that cardamom is grown in the state of Bijapur, while ginger is grown on a large scale in Ahmedabad. Black pepper was mainly produced in Malabar, Tuticorin, and Calicut, although some of it also came from Bijapur.

European travellers travelled to different regions of India and noted the major crops, fruits, and agricultural systems there. The crops and fruits of each province are influenced by the climate and the culture is influenced by the agricultural specialties there. Sindh was known for its dry climate where agriculture was done in very limited areas. Crops and fruits were also limited, hence the social system there was based on animal husbandry. Where there was a good water supply, agricultural production was high. Alexander Hamilton, who visited Sindh during the reign of Aurangzeb, reported that Sindh was rich in cattle, fruits, and other agricultural products. Sindh was rich in wheat, rice, beans, and cattle; Hamilton said that people never knew the horrors of the famine. But this situation was not present in the entire Sindh because many travellers have described the desert of Sindh as terrible. Rainfall was very low and growing crops was almost impossible. Only Thatta and Multan in Sindh had access to the Indus River.'⁹ Due to this, these areas became the fertile provinces of Sindh. Hamilton writes that during the monsoons, the Indus River flows through all the low-lying plains and often floods them. After a flood, the river leaves a layer of soil on the ground, which is plowed up before it dries. Ploughing in this area produced abundant crops. Hamilton described a fruit from Sindh that was the size of a peach but had no stone.¹⁰ Sindh was famous for its cattle and milk products. Sindh exported large quantities of butter to other regions, about which Hamilton writes that they melted it slowly and put it in jars, which were called *duppas*.¹¹ Bernier found that the Kashmir province was suitable for diverse agriculture, horticulture, and flower crops. Despite good sources of water, agriculture in the region was largely dependent on rainfall. Farmers had limited options for growing crops, however, as the soil was fertile but fragile due to the hilly terrain and prone to erosion. Rice was the main crop of Kashmir and was cultivated mostly on the hill slopes. Apart from this, maize, wheat, barley, and various types of vegetables were mainly grown here.¹² William Finch visited Srinagar with Jahangir. He writes that Kashmir is a big country, and Srinagar, situated on the Bihat (Jhelum) river, is its main city. This country is a good plain spread over the mountains for about 150 *kos* which produces various types of fruits, grains, saffron, etc. in abundance.¹³ Francisco Pelsart also wrote that many types of fruits were grown in Kashmir, but nothing was grown here except saffron for export to Agra. The crops grown in Kashmir were consumed by the people of Kashmir themselves; hence, apart from saffron, they had nothing else to export. Although its fruits were very much liked. Thévenot praises this country for its fertility. He writes that the waters of the mountains which surround it bear so many springs and rivulets, that it makes it the most fertile country of the Indies.¹⁴ John Marshall did not agree with Francisco Pelsart that Kashmir had nothing to export except saffron. He writes that Kashmir was a huge storehouse of wheat, barley, rice, and many types of fruits. Its fruits and grains are sometimes sold for 5 *maunds* and 1 rupee in other cities. Grapes $\frac{1}{2}$ *maund* for Rs 1; Also, roses abound, they have excellent wood, fur, etc.¹⁵ John Marshall says that fir trees grow in large numbers in Kashmir. Bernier praises the richness of Kashmir for its agriculture, flora, and fauna, saying that 'the whole kingdom bears the form of a fertile and highly cultivated garden.'¹⁶

Lahore was the main province of the Mughals, which was located in the Punjab *Suba*. It was located in the northern part of Punjab, and the Beas and Sutlej rivers created fertile land in it. Deepalpur was very popular in this region for its extensive forest. In terms of crops, it was the highest producer.¹⁷ Mannucci has also mentioned that the whole country is well cultivated and it is the most fertile part of India.¹⁸ He writes that all types of crops and fruits are grown here in abundance. He writes that the roads on both sides were surrounded by fruit trees, and every five or six *kos* there was a *Sarai* (inn) built by the Mughals or nobles, where travellers could get rest and food. Similar accounts are also found in Thévenot's diary. Thévenot writes that Lahore is one of the largest

and most bountiful provinces of India. The river that flows through it makes it extremely fertile. This river provides everything to this province which is necessary for life. Rice, maize, and other types of fruits are grown in abundance here.¹⁹

The two provinces of modern Uttar Pradesh, Allahabad (modern Prayagraj) and Awadh, were quite fertile in the seventeenth century. There was a large population settled on the territory of Allahabad on both the banks of the Ganga. Awadh extended from the Gandak River in the north to the Ganga in the west. Irfan Habib, Shirin Moosavi, and Meena Bhargava say that by the seventeenth century, much of Gorakhpur (eastern UP) was covered with dense forest. Meena Bhargava in her book *“Exploring Medieval India: Sixteenth to Eighteenth Centuries”* talks about how the forest land in the region of the Ganga Yamuna Doab had drastically reduced in the early eighteenth century. Shireen Moosvi says that the expansion of agriculture has largely come at the expense of desert, grasslands, and scrub.²⁰ The travellers had not seen any forests in this area during their journey. Pelsaert noted that firewood was in great demand in the Agra region and forests were scarce. Due to a shortage of firewood, it was brought from remote areas. Shirin Moosavi says that 'the forests near Agra and Lahore provided firewood to the royal family alone for 150,000 people annually. 600 vehicles were reserved to transport this quantity.'²¹

In the context of Gujarat, Irfan Habib and Shirin Moosavi opine that in the seventeenth century, Gujarat was a very fertile region and there was a lot of intensive agriculture. Describing the agricultural system of Gujarat, the European traveller Duarte Barbosa, says 'It is a very fertile country. Wheat, barley, millet, rice many fruits, etc. were in abundance in Gujarat, and in its neighbourhood, there were deer and other animals. There were many hunting grounds for animals.'²² Shireen Moosvi also agrees with Duarte and shows that 'some parts of Gujarat were highly cultivated areas, where the land was very fertile. The extent of cultivable land in Baroda, Surat, and Naudat reached about 90 per cent in 1903–4.'²³ Tavernier also pointed out that from Surat to Broach, the land between the two towns abounds with corn, rice, millet, and sugar cane.'²⁴ It appears that here too the forest land must have been cleared and made suitable for farming. The contribution of the British colonial government to this was also incomparable. There was significant improvement in the irrigation system and the vacant land was also brought under agriculture. Pietro del Valle said that in some parts of this country, there was a shortage of water, so they used to collect rainwater in ponds which was sufficient for agriculture. He writes that people have nothing else but the rainwater collected in the Surat Lake; this lake has so much capacity that it can provide water to a city for an entire year or even more. This lake not only provides water to humans and animals but also serves all other purposes.'²⁵ These forests were cleared to convert to agricultural land so rapidly that even European travellers took notice. Mendeslo confirmed it but he also pointed out that Baroach imported a great quantity of timber from the distant lands.²⁶ He said that the land round the city was very fertile, yielding rice, wheat, barley, and cotton in great abundance.'²⁷ Mandeslo finds a similar situation in Cambay, writing 'there is no province in the whole Indies,' more fertile than Gujarat. Fruits grow in such abundance that all the neighbouring provinces are supplied from here.'²⁸ Alexander Hamilton, who visited Gujarat in the seventeenth century, says that all the areas in Surat are plain, and the land of the country is very fertile, but towards the sea it is sandy. He writes that they have wheat in abundance, as good as any other country in Europe, and besides this, they also produce several species of beans, which are a common food of this country. Peas and French beans are grown here in abundance. He says that beef, mutton, and poultry are very good in this country and quite cheap.²⁹ Jean de Thévenot says that 'the Narmada, the Tapti and many other rivers water this region, and make it very fertile. Because of maize, the fields of Gujarat look green in all seasons of the year. Rice is also grown here and covers the fields throughout the year.'³⁰ Pietro Della Valle points to the vast agricultural land in Surat. He writes that the fields are 'full of living creatures either being ploughed or used for grazing.'³¹ He cites the climate of this region as the main reason for its productivity. He says that the soil of Gujarat is suitable for the climate, is warm enough, although there are not rivers everywhere, but agricultural production is good.'³² Tavernier has written that Ahmedabad was popular for sugar and cotton. Opium comes from Burhanpur, and tobacco and indigo are cultivated in abundance in the neighborhood of Burhanpur.³³

Malwa, known today as Madhya Pradesh, was a region of vast fertile forest land in the seventeenth century. However, the area under cultivation in this region had doubled during the reign of Aurangzeb compared to the reign of Akbar. Irfan Habib says that in the Berar region, 'almost all regions had been brought under the measurement by Aurangzeb's reign.'³⁴ Despite increasing farming, European travellers like Ovington, Pelsaert, Bernier, etc. recorded large areas of forest that still existed and were full of wild animals. Thévenot says that the province is very fertile, and produces here all the crops which are grown in other places in India.'³⁵ He said that this province bears plenty of rice and Indigo. The extension of cultivation had taken place largely in a central region that was covered largely with dense forest. Niccolo Manucci pointed out that Burahnpur or Brampur largely supplied vegetables and fruits to the kingdom of the Mughals.

Forests were much more extensive in East Bengal but here also extensive farming can be seen. Large parts of the forests in the delta areas were cleared. Despite the expansion of agriculture in Bengal, forests were also abundant throughout the region. Most of the area of Chittagong was covered with forests under the Magh rulers and there was little change in this when this area came under the Mughals.³⁶ British Records and J. Renal shows in his map that till the eighteenth century, the districts of Sylhet and Madhupur were covered with dense forests. Apart from this, there were extensive forests in Odisha and Bihar. Despite the maximum

expansion of agriculture, by the end of Akbar's reign, the Bengal region, where large tracts of forest land had been converted into agricultural land, was covered with dense forests. There was a total of 109,923 villages in Bengal under Aurangzeb, except Kamrup (Assam), which shows a rise in population and increasing agricultural area.³⁷ Abul Fazl also informs us that cultivable land had extended as far as the deltaic Sundarbans and despite the expansion of agriculture in the remote areas of Bengal, the forests were quite extensive. By the end of Aurangzeb's reign, the district of Sylhet was covered with dense forests. For Odisha and Bihar, we have good travellers accounts for extension of agriculture; travellers mention densely populated belt along the Ganga.

This region had extensive agricultural fields, which every traveller has praised for their high fertility. Thomas Coyrat has mentioned that Bengal, which was part of the Mughal Empire, was the most fertile land.³⁸ Fransico Payards a French traveller, said that Bengal was a very nursing mother, who supplied them with their entire subsistence and food.³⁹ He said that there is a good supply of animals in the country (Bengal) and the meat of the animals is very cheap. Cotton and silk are produced in large quantities here. He said that, like cotton, silk is also produced in abundance, which is of the brightest yellow colour. Various types of colourful items are made from it, and they are exported to all parts. Regarding the quality of cotton and silk, he writes that the inhabitants of Bengal, both men and women, are amazingly adept in all manufactures, such as cotton cloth and silk, and in needlework, such as embroidery. They work so efficiently that even the smallest stitches are not visible anywhere.⁴⁰ Bernier writes that it is true that Bengal does not produce as much wheat as Egypt, but this is not their fault, for the inhabitants themselves depend far more on rice than on wheat, and rarely taste bread.⁴¹ Gemelli Careri also found Bengal to be healthy and temperate. He praised its fertility, and he said that Bengal was a land of wondrous fertility, there was such a quantity of rice, that besides supplying the whole country, it was exported to all parts of India.⁴² Manrique Sebastien said that 'the climate of this kingdom was on the whole healthy, and the water of the Ganga and other local streams was excellent. 'Abundant crops of foodstuffs are met with, especially wheat, rice, vegetables, sugarcane, *ghi*, and numerous oils, excepting that of the olive, and the flesh of various animals, both domestic and wild, is plentiful.'⁴³ Sebastian Manrique said that Bengal produced wheat, rice, vegetables, and sugarcane in abundance. He said that 'rice is far superior to that of Europe, particularly the scented variety, which is not only of extraordinary fineness and delicacy of flavour but even retains its fragrance after it has been cooked.'⁴⁴ Varthema claimed that the city was one of the best that he had seen. Bengal produced large quantities of rice, wheat, sugar, ginger, pepper, cotton, and silk. Francois Pyrard, a French traveller, found Bengal to be healthy and temperate, and so wondrously fertile.⁴⁵ Many countries of the Deccan, which were not a part of the Mughal kingdom, were also rich in agriculture. In 1607, Francois Payard, who was in Malabar, mentioned that 'The Malabar soil is very fertile, and the climate good.'⁴⁶ He further wrote that the whole country is covered with fruits, which are common property and free to passersby.'⁴⁷ Alexander Hamilton pointed out that the country of Barceloar (Bijapur) produces an abundance of rice, and they grow two crops in many places in a year; they have some lakes at the feet of the mountains, whose water are confined by sluices, are let out at a time to water their rice fields.'⁴⁸ Hamilton pointed out that the Malabar country was the most fertile. Rice was abundant. He said that higher grounds, which were the most fertile and produced pepper and cardamoms, were the best in the world. Drugs, teak timbers, and sandalwood grew plentiful. The land of Golconda was so fertile, that Joannes De Laet mentioned that in many places of the country crops of rice grew abundantly and in some places, three crops were obtained. Wheat was also an important crop but other kinds of crops were unknown to Europeans. Tavernier had visited Golconda by different routes, speaking of it richly. Tavernier also described the fertility and beauty, he says that Golconda produced an abundance of corn, rice, different types of vegetables, cattle, sheep, and other commodities necessary to live. He found that there were numerous tanks full of good fish. He wrote that 'nature has contributed more than art to make these tanks, of which the country is full. They are generally situated in somewhat elevated positions, where it is only necessary to make a dam on the side of the plain to retain the water.'⁴⁹ John Fryer visited Golconda in the seventeenth century, he also found varieties of fruits and vegetables. He wrote that fowls of all sorts belonging to India are plenty, but chiefly tame Geese.'⁵⁰ Fishes were in abundance. Thevenot also praised Golconda for its fertility, he said that 'in this country also they have two crops a year of rice, and many other grains.'⁵¹

Irrigation had a different importance in the Indian agricultural system. The irrigation system was known in India since ancient times. There were ample hydra resources in most parts of the country; also, due to the different topography and geographical location, several methods of irrigation were used in different parts of the country. Even then, irrigation by canals was not everywhere, however, wells and ponds were a common source of irrigation. But much of the cultivated land was entirely dependent on the monsoon rains Francisco Pelsaert wrote that 'from April to June the fields remain hard and dry, not fit for plowing on account of the heat. When the land becomes wet after a few days of rain, farmers start sowing indigo and rice. A few days of rain produce indigo, rice, and various types of grains eaten by the poor, such as jowar, millet, etc.'⁵²

Irfan Habib says that wells were most prevalent in India for irrigation. Francisco Pelsart also observed that to irrigate the land, a large number of wells had to be dug. Babar found in Agra that the farmers were using a Persian *charkha* to draw water from wells for irrigation of their fields. However, the work of digging wells was lengthy and expensive, so not everyone was able to dig wells in their fields. He described the types of wells and techniques, but he never said anything about the scarcity of water. The country was self-sufficient in surplus because the Mughals encouraged many nobles and individuals to build and repair many hydraulic devices.

Common people used only natural ponds, etc. According to Francisco Pelsaert, the common people in Gujarat used to collect rainwater in artificial ponds so that water was available for irrigation in summer. Stepwells were more prevalent in Gujarat and Rajputana. However, it is difficult to say to what extent these stepwells were used for irrigation. A.L. Srivastava clearly states that 'artificial irrigation was absent in Akbar's days, yet the country was self-sufficient in agricultural products and corn did not have to be imported from outside even in times of shortage.'⁵³ Alexander Walker, a British engineer who visited India in the eighteenth century, observed that 'in the past, the artificial irrigation of agricultural fields was physical geography prevalent in India, and showed more laborious ingenuity than in any other country.'⁵⁴

However, the Mughals encouraged agriculture, resulting in many forest regions being converted into agricultural lands. Many travellers pointed out that forests and wastelands around the cities were gradually disappearing. There were not enough forests near cities. The first time, this happened only in the seventeenth century, because no travellers who visited India in the seventeenth century had a complaint about the shortage of wood. Many travellers who visited in the fifteenth and sixteenth centuries pointed out that many cities like Surat, Gwalior, Agra, etc covered with dense forests. In the seventeenth century, many forests had disappeared and been converted into agricultural land. Abul Fazl, Pelsaert, Bernier and many travellers recorded that there was no forest in these cities. Forest products were in high demand in the cities. William Finch, during his journey from Agra to Jaunpur and from there to Allahabad (Prayag), saw continuous dense forests all along the way.⁵⁵ Even in the cities, special care was taken of greenery; although there were vast agricultural areas around the city, the forests were not harmed. Travellers have cited that the number of forests in India is high. Francisco Pelsart, describing Gujarat, writes that trees were in abundance around the city.⁵⁶ The dense forest around Awadh was cleared and converted into agricultural land. Chetan Singh has said that the pace of converting forests into agricultural land increased in the seventeenth century. Regarding rural society, he writes that 'The rural landscape of Mughal India is often depicted as a vast expanse of cultivable land dotted with innumerable villages. That is, only fields were visible in the villages far away, and the forests had shrunk.'⁵⁷ Pelsaert, Abul Fazl pointed out that there was a shortage of firewood and fodder. However, this situation happened in nearby Agra and Gujarat *suba* where the price of firewood and fodder was very high. Abul Fazal writes in *Ain-i-Akbari* that there was a great demand for green fodder and wood in the city, and it was available at a high price.⁵⁸ Francisco Pelsart also pointed out that 'firewood had to be brought from far-off forests, so the price of wood was high in cities and common people could not buy it.'⁵⁹ People used cow dung cakes as fuel instead of wood. Francisco Pelsart pointed out that, 'poor people mix cow dung with straw, dry it in the sun, and burn it.'⁶⁰ A limited source of firewood was available to the common people, and it was sold at a high price. Francisco Pelsaert has also pointed to the depletion of forests, writing that 'firewood is very expensive, and is sold in 12 to 18 pieces for 60 pounds by weight, making serious annual expenses for a large house. It costs money.'⁶¹ Irfan Habib pointed out "the value of firewood needed in every household."⁶² He said that "the peninsular forests provided teak; in the north Indian forests, *sal* was the valuable timber. Both were used extensively for buildings and furniture. Not to forget the numerous varieties of bamboo and cane that grew wild in the forests and were used in many ways for making thatched roofs, baskets, canes, etc."⁶³

There was also great demand for firewood in the imperial house, where thousands of tons of wood for fuel were required annually. Shireen Moosvi said the forests near Agra and Lahore provided 150,000 tonnes of firewood annually for the imperial household alone, and 600 carts were reserved for transporting this quantity.⁶⁴ Due to the high demand for firewood, the price of wood was so high that, in the 1680s, wood worth 5,000 rupees was brought from Khelaghar in Dehradun to Delhi to be used for constructing a noble's house.⁶⁵ Shireen Moosvi also drew attention to fuel, arguing that the forests were under pressure because firewood was not readily available for the cities. She mentioned that in the seventeenth century, firewood was transported long distances as a large amount of firewood was needed for imperial cooking. ⁶⁶ Sumit Guha on Maratha highlighted a similar situation, however, in his paper "Claims on the Common: Political and Natural Resources in Pre-Colonial India", that the Mahar community in Maharashtra was highly engaged in preventing wood cutting in village common land. Village communities for fuel purposes depended on biotic resources that were obtained from domestic animals. ⁶⁷

By the eighteenth century, many forests had disappeared. Rennell reported that great change had taken place in the eighteenth century, with many of the earlier forests being cleared. Rennell's maps of the 1780s show that much of the forest in northern India had been cleared rapidly. Irfan Habib, in the *Agrarian System of Mughal India*, shows that the Indus basin contained a large area of forest, the most important being the Lakhi Forest around Dipalpur.⁶⁸ By the end of the eighteenth century, the dense forest around Dipalpur was cleared and converted into agricultural land. Chetan Singh has said that the pace of converting forests into agricultural land increased in the seventeenth century. Regarding rural society, he writes that 'the rural landscape of Mughal India is often depicted as a vast expanse of cultivable land dotted with innumerable villages. That is, only fields were visible in the villages far away and the forests had shrunk.'⁶⁹ J. Rennell also shows that till the 18th century, many forests in the Ganga Doab were cleared. Similarly, in other valleys too, like the Krishna, Kaveri, and Narmada, forests were cleared.⁷⁰

Despite the continuous depletion of forests, the Mughals were preserving the forests around Agra, and there were still many forests left. The forests that the Mughals were protecting were their hunting grounds. It was prohibited for people to cut these forests and hunt here. The Mughals used to go to these forests for hunting in

their free time. Forests and animals were protected in these hunting grounds so that the Mughals never faced a shortage of prey for sport. It is wrong to think here that the Mughals were naturalists and hence they protected forests and animals.

Shireen Moosvi estimated that during Akbar's time, about one-third of the total area was cultivated. Although Shireen Moosvi does not cover the entire area of the Mughal Empire, it was undoubtedly the extent of cultivation under the Mughals. From this statement, it appears that despite the development of cities and the expansion of agriculture, there must have been vast areas of forests and wetlands. When the Mughals donated any land to someone, the recipient also had rights over all the forests, trees, ponds, etc., falling under that land. It is worth noting that the land donated was often barren. The administrator expected that the donor would convert this barren land into cultivable land and that the state would earn income from it. By reducing taxes, the state encouraged converting land into agricultural land. Despite this, the Mughals were promoting the expansion of agriculture, but we should also keep in mind that the expansion of agriculture was not happening very fast. There was still a large area of forest and land that was not being claimed by anyone. Contemporary historians and travellers of the seventeenth century also indicate that a large area of land was not under cultivation. Wherever farming was taking place, farming was being done very intensively; in some places crops were being harvested twice a year. The Mughals had a policy of expanding agriculture but not eliminating forests. He even encouraged planting trees. During his time, no forest was destroyed or reduced. The forest was also a source of income and sport for them. Travellers say that there were dense forests near their capital, Lahore, Agra, and Delhi, where they used to go hunting. Travellers found dense forests in the middle of many highways.

Crops of India

The most important feature of the Indian agriculture system in the seventeenth century was the large number of different crops grown by the peasants. Many types of food crops rabi and kharif were produced in India. Babur mentioned that India is rich in husbandry animals, which is supported by agriculture. He described that there is a great store of salt; and to sweeten it all, the country has sugar in abundance. Apart from this, different types of fruits like lemon, orange, pomegranate, date, fig, grapes, etc. are grown in abundance in this country.⁷¹ Indian crops had a fixed time for sowing to harvesting, and almost all festivals were related to agriculture in some way or the other. European travellers have described that Indian fields were always covered with a variety of crops. Edward Terry describes the timing of the sowing of crops, saying that the months of May and early June were the time for sowing seeds; their harvest time in November and December was the temperate months of the year.⁷²

Indian farmers were not only growing many crops, they were always ready to accept new crops. The two major crops in the seventeenth century were tobacco and maize, soon these crops occupied a large part of the cultivable land. Edward Terry said that 'the main commodities of this empire are indigo and cotton. Apart from these, it was difficult for the travellers to count the different types of crops grown in India. *Ain-i-Akbari* gives the revenue rates of sixteen Rabi (spring) crops and twenty-five Kharif (autumn) crops but this list also does not mention any non-food crops.'⁷³ Duarte Barbosa who visited in the sixteenth century the southern part of India was in Malabar; he writes that everything is produced every month of the year. He mentions sugarcane and indigo require one year to mature and grow in fertile black soil. In most parts of India, two crops were taken in a year. Ibn-Batutta, in the fourteenth-century remarks, that peasants sow twice crops in a year. He observed that during the rainy seasons, in the hot season, they sow the autumn crop and harvest it sixty days later. When they harvest the first crops after sixty days, they sow the spring cereals. As for rice, he remarks that they sow three times a year. Sujan Rai Bhandari informed us that in many regions of Panjab, even three or more crops were obtained in a year.

Babur was also amazed to see grazing grounds and found rice cultivation here and there. In the areas of Malwa, Gujarat, Ajmer, Khandesh, Delhi, Lahore, Agra, and Multan Kharif crops in which Bajra, Jowar, etc. were grown. Irfan Habib pointed out that in each locality as many as forty-one crops were being cultivated.⁷⁴ Geoffrey Parker says that 'farmers there cultivated 19 spring and 27 autumn crops, thus securing two harvests each year.'⁷⁵ Irfan Habib mentions many places where peasants grew many crops, like in Delhi. Many crops were grown only in a small region and revenue records of a village of eastern Rajasthan in 1796 show that they were growing around thirty-eight crops. Until the seventeenth century, maize were confined to the Deccan (Maharashtra) and eastern Rajasthan under its common name maize. It was always known as the wheat of the poor. It is worth noting that it was very difficult for the poor to buy this wheat, hence the people of North India mostly consumed coarse grains in their diet. Although wheat production was very high. Many types of crops were grown only for export. Babur mentions that many crops are grown in the country of Hindustan, and not all 'crops and gardens require water in cultivation'. Babur was referring to the irrigation system which was not available everywhere. He further writes that autumn crops grow only with heavy rains, and strangely, spring crops grow even when there is no rain.⁷⁶

Rice

Rice was grown as a major crop in Bengal, Odisha, Bihar, Awadh, Allahabad (Prayag), Agra, Lahore, Khandesh, Berar, southern regions and Kashmir. But Bengal and Bihar produced rice in large quantities which was of good

quality. Various varieties of rice were grown in India but good quality rice was only for export. In many places, like Bengal and Bihar, rice was harvested twice a year, and in some places even thrice a year. The productivity of rice depended on good soil quality and availability of water. Bernier reported that three crops of rice were grown in a year in Bengal and that many varieties of rice were grown in the region. The best quality rice was produced in Awadh. Bada'uni in *Muntakhab-ut-Tawarikh* has praised this rice and given information about its quality. He says that its quality and taste are beyond all praise.⁷⁷ Even in the areas where rice was not cultivated earlier, rice cultivation started due to the irrigation system introduced by the Mughals.⁷⁸ Various travellers have described the good quality of rice grown in Bengal and its taste which was very popular among the people and the king. Bengal was at the forefront of the production of rice. Francois Pirard said that Bengal exports rice to the entire country. He said that when navigation is good, rice is very cheap in Bengal. Bernier pointed out that the large kingdom of Bengal produced not only rice, maize, and other necessities of life, but also innumerable goods for commerce.⁷⁹ Father Manrique praised the rice of Bengal, saying 'the rice of Bengal is far superior to the rice of Europe, especially the fragrant variety, which is not only of extraordinary beauty and delicacy in taste but also when cooked its aroma remains intact because it contains a large number of aromatic components.'⁸⁰

Apart from Bengal, rice was also produced in good quantity in Bihar. Abul Fazal comments that the best quality rice is produced in large quantities in Bihar. Burhanpur, which was in the Malwa region, also produced rice and maize in good quantities. Ralph Fitch writes that 'huge reserves of maize and rice have developed here.'⁸¹ Thévenot confirms Ralph Fitch's statement, saying that much of the province of Balaget (Malwa) is cultivable land; and the rice (which covers the fields) is the best in all of India. It has an aromatic flavour, which is not there in other countries.'⁸² Rice was also a major crop in those areas of Gujarat where irrigation facilities were available. Jean de Thévenot says that the soil of Surat was good for rice. Rice was the most popular crop in the South. Abul Fazal says that rice was produced in Calicut, but it also imported rice from other places because the consumption of rice in this country was very high. Hamilton said that the Dutch have a factory here, only to buy rice for their garrisons on the Malabar coast.'⁸³ The Portuguese also supplied the rice to Goa from this place, and they have six or eight ships belonging to Barceloar, that carry rice for Muskat.'⁸⁴ Malabar country produced rice in abundance but corn was imported from Canara.

Wheat

Wheat was cultivated exclusively in the northern plains, although, in the seventeenth century, wheat had begun to be grown in Bengal, but was still being grown mainly in Punjab, Awadh, Malwa, Gujarat, Bihar, etc. Central India and Gujarat produced good quality wheat, and it did not require much water. Wheat along with barley grew in abundance in Gujarat and Rajasthan. To the west, sorghum grew mostly in abundance in the Divalpur region, however, wheat was also a major crop in the region. Edward Terry said that their wheat grows like ours, but the grains are larger and whiter.'⁸⁵ Wheat was produced in abundance in India, but in the seventeenth century wheat was very expensive, and common people rarely used it in their food. Coarse grains like millet, sorghum, maize, etc. were their main grains. Abul Fazal in his *Ain-i Akbari* states that the value of wheat is higher than all other grains. Ordinary farmers grew this crop for the market, while landowners mostly kept it for themselves.

Cotton

Cotton, sugarcane, indigo, and tobacco were the major cash crops of India. Cotton grew mostly in the Khandesh and Gujarat regions, however, it was also cultivated in northern India but the quality was lower there. Cotton cultivation spread rapidly in the interiors in the seventeenth century because there was a great demand for cotton in Europe. It was adapted to the Indian climate and was a relatively high-value crop. Edward Terry clearly said that India has two main bases; Indigo and cotton. He wrote that for cotton, they sow seeds which grow and grow like our rose bushes. Francois Pirard writes that 'Cotton is very abundant in Bengal; after arranging for the use and clothing of the natives, and besides exporting the raw materials, they made cotton cloth in such quantities, and woven with such excellence, that these articles were exported, and is exported throughout India, but mainly in the Sunda part.'⁸⁶

Sugarcane

In cash crops, Sugarcane crops grow in very large areas in India, however, comparatively, it was a less valuable crop than cotton. Edward Terry said that 'to sweeten all, there was an abundance of sugarcane crops growing in the country, which after it is well refined, may be brought for two pence the pound or under.'⁸⁷ Many varieties of sugarcane were grown in India which were classified based on their colour, quality, and sweetness. The quality of sugarcane grown in Bengal was of the best quality and was in great demand all over India. Abul Fazal has mentioned three varieties of sugarcane, pounda, black, and ordinary. Apart from Bengal, sugarcane was also grown in the areas of Agra, Allahabad (Prayag), Awadh, Lahore, Multan, Malwa and Ajmer. Abul Fazal classifies sugarcane based on soft and hard. He says that one species of sugarcane is very soft and rich in juice. In the seventeenth century, sugar cane was used to make sugar, white candy, refined sugar, and intoxicating liquors. Jean Baptiste Tavernier reported that 'moist sugar was exported from Bengal, and sugarcane was grown in abundance in Hooghly, Patna, Dacca, etc., but the sugar was manufactured in Ahmedabad. He said,

the people here know how to refine it, and it was called royal sugar or Bengal sugar. This sugar production was very good both in quantity and quality. François Pyrard said that 'there is an abundance of sugarcane in the country, which they eat raw; or fill their ships for trade. From this sugarcane, they make excellent sugar, the like of which is not made in any part of India except Cambay and the other countries of the Mughals adjacent to Bengal.'⁸⁸ Jean de Thévenot saw a large field of sugarcane in Surat. He said that the soil of Surat is very fertile and is never fertilized. He also praised Balagat land for the sugarcane crop; he said that there is sugarcane in many places. There are mills to crush the sugarcane, and furnaces to boil the sugar.'⁸⁹

Indigo

In the seventeenth century, indigo became the most important crop as it was in high demand in Europe. European travellers like William Finch, Pelsaert, Terry, Mundy, and Tavernier drew attention to the indigo crop. Indigo was cultivated mainly in Agra, Gujarat, Awadh, Bihar, and Bengal. William Finch states that indigo grows in abundance in the Bayana tract near Agra and that indigo of inferior quality is produced in the Doab. Edward Terry considers indigo as the most important crop; he says that 'the chief commodities of this empire (Mughals) are indigo and cotton.'⁹⁰ Indigo crop was cultivated in Gujarat, especially Ahmedabad but the quality was not as good as in Agra. Peter Mundy noted that the indigo from Agra was the best, and it was commonly known as Agra indigo. Although good quality indigo was grown in Sindh, it was not grown over a wide area. In the south, Telangana, Khandesh, and East Bengal produced good quantities of indigo. Indigo is used in dyeing clothes and making paint. Indigo crop generally requires a warm and moderate climate. Buy it grows best in irrigated lands. Pelsaert said that indigo was sown in the month of June when the first rains occurred. He explained that if rainfall is moderate, the crop grows prolifically during all four months, and is usually harvested in late September or early October when it is fully ripe.⁹¹ On one hand, indigo farming was a profitable business, on the other hand, it also had natural dangers. Farmers often had to face natural disasters. Pelsaert writes that sometimes rain would start suddenly during the winter season and if harvesting of this crop was postponed for too long, indigo would lose its color. Sometimes, the indigo crop faces bad luck; he mentioned that the quality of Nauti (inferior quality compared to the Ziyari indigo crop) gets degraded due to low rainfall. The seeds dry up in the ground, and due to excessive rain and lack of sunlight, the plant quickly rots or gets washed away. But despite this, indigo cultivation expanded greatly in the seventeenth century. Pelsaert states that in the neighborhood of Bayana, the dominance of indigo was to such an extent that as far as the eye could see, they saw entire fields of indigo, nothing was visible except the bare stalks of the indigo crop. This was all due to the price of indigo being very high.'⁹²

Tobacco

The crop that attracted the most attention in the seventeenth century was tobacco. Before the Mughals, tobacco had been used in South and Goa, from there this crop spread to Northern India, however, it was introduced by the Portuguese in the fifteenth century. In the first phase, tobacco cultivation was mainly on the western coast, but by the middle of the seventeenth century, it started being cultivated in almost all parts of India. Although Abul Fazal does not describe this crop in *Ain-e-Akbari*, he clearly states that tobacco was a crop brought from Bijapur, where it was quite popular among the people. This crop soon established dominance in North India. Tobacco consumption was very high among the Mughals and its value was also high so Jahangir banned the use of tobacco among the nobles but this ban was formal and ineffective. In northern India, tobacco was cultivated mainly around Agra where its demand was high. Edward Terry said that tobacco cultivation was very popular in Agra, they (farmers) grow tobacco in abundance.'⁹³ Initially, there was not much knowledge about this crop among the local farmers, they did not know how to use it. Their efficiency in growing this crop was not like that of the farmers of the south. Edward Terry writes that they do not know how to fix it and make it strong, as is the case in Western India (West Indies).'⁹⁴ The accounts of European travellers show that during the reign of Shahjahan, this crop had started being grown on a large scale in all parts of India. There was a lot of enthusiasm among the farmers towards its cultivation because this crop was ready in a short period and even harmful organisms did not affect this crop. The expansion of tobacco cultivation around Surat and Sindh was very rapid, with Gujarat soon becoming its largest-producing region.

Spices

For Europe, India was a major producer of spices, which were in great demand throughout Europe. Every European traveller has mentioned these spices in their accounts. Foreign companies and many travellers who were traders continued to visit the Deccan, especially Malabar, and other areas. Different varieties of spices were grown in many areas of the South. There were two types of black pepper, one small and the other very large in size; these were called small and big chilies respectively. Black pepper largely comes from Malabar, Tuticorin, and Calicut; some part of it also comes from Bijapur. It was reported that nutmeg, cinnamon, cloves, and mace were the only spices the Dutch had. Nutmeg, mace, and cloves come from the island of Malacca, and cinnamon came from the island of Sri Lanka. European travellers discovered areas where ginger and other spices were grown in abundance; these items were very profitable from the point of view of commerce. The Malabar region was famous for its spices, especially cardamom, ginger, cloves, cinnamon, pepper, and nutmeg. Cardamom was grown extensively in Bijapur, while ginger was cultivated in all parts of India. European traders

came here to buy excellent cardamom; which was an expensive item. Black pepper was cultivated in abundance in Bijapur, Malabar, Cochin, and other parts of the south. Travellers visiting areas of southern India have noted the abundance of spices. The pepper plant was a wonder to them. Ibn Battuta reported that the pepper plants looked like vines, the leaves looked like that of asafoetida and the black pepper fruits looked like small clusters like blackberries. As long as they were green and raw, they were not plucked but the peppers were ready in autumn. He states that it produces its fruits in small clusters, the grains of which when green are similar to those of Abu Kinninah. In autumn people collect them and dry them in the sun, like drying grapes to get raisins. They keep drying them until they become completely black and then sell them to the trader.⁹⁵ Gemelli Carreri also gives a similar description. He says that its fruits grow in bunches like grapes and turn red when ripe, but the Indians burn and blacken them so that they can be used anywhere as seeds.⁹⁶ Vartheman travelled to Calicut in the fifteenth century where he saw many pepper trees. Calicut was an important place for the harvesting and trading of pepper and other spices. Cinnamon was another important spice which was cultivated in abundance in Malabar. Gemelli Carreri writes that this plant does not bear any fruit but its bark is valuable, which when removed, grows back on the tree.⁹⁷ Jean Baptiste Tavernier said that in Malabar, spices like cardamom, ginger, black pepper, nutmeg, mace, clove, and cinnamon are grown in large quantities. He said that cardamom comes largely from Bijapur and ginger comes largely from Ahmedabad.⁹⁸

Apart from these, innumerable crops were grown in India, which are not possible to describe here, but from the descriptions of European travellers, it appears that the condition of the farmers was not prosperous. Apart from natural disasters, the burden of taxes on them was high, hence despite getting abundant crops from farming, their economic condition was poor.

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