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## **Timber exploitation: The beginning of early colonial onslaught on Indian forests in the background of industrial revolution in the 19<sup>th</sup> century**

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### **Abstract**

In the mid-19th century, with the establishment of British colonial regime, the Indian subcontinent witnessed a paradigm shift in its primordial environmental ecosystem. In the context of Industrial revolution in Europe, the colonial establishment brought about an unprecedented exploitation of Indian Forests. The dense vegetation covers of these Indian forests are rich in huge timber resources, which were one of the mainstays of the then Western Industrial ecosystem, particularly for the transport & communication sector. By 1878, new 'scientific' regulations and laws for forest conservation were brought in, not basically to save forests, but primarily for sustaining the future resources of their own colonial economy. Hence began an age of indiscriminate exploitation of forest for the sake of timber collection. Estimate suggests how only between 1869-80, around 8,50,000 tons of timber were felled only from Sutlej and Yamuna River forests of North Western Himalayas, for supplying the railway sleepers. Just imagine how horrible would be the deforestation scenario if one equates these estimates over the entire forested land of the subcontinent for this whole span of time! Moreover, the colonial exploitation of Indian forestry not only destabilized the ecological balance of the region but also disturbed some of the ancient socio-cultural practices, particularly that of the indigenous tribes. The following paper would try to analyze this entire issue of timber exploitation in the Indian subcontinent, in brief.

**Keywords:** Timber exploitation, Indian forest, forest laws, industrial revolution, north western Himalayan river valleys, coniferous forests, railway sleepers, shipbuilding industry, scientific forestry, rotation period, tribes, missionaries

### **Introduction**

Environmental issues have been taken lightly by the conventional historiography. Yet in light of the current pandemic situation of 2020-21, Mother Nature have once again pointed us that how humans are still a tiny creature in face of the destructive power of nature. However, the problem is deep rooted and the responsibility of the human civilization behind all the past environmental crises cannot be just disagreed. Ever since the Stockholm Conference (1972), various scientists across the world have tried to raise concern over this rising issue.

So how was the historical precedence behind the relationship between man and nature? According to academicians like Prof. Sjur Kasa of Centre for International Climate and Environmental Research (CICERO), Norway, till 1700s man and nature maintained a symbiotic relationship on the whole. Although, humans used to harness natural resources for their own upbringing, ever since their evolution, but still the trend was not an exploitative one. However, with the Industrial Revolution of 1780s came the paradigm shift in context of environmental crisis <sup>[1]</sup>. The Industrial revolution and its succeeding capitalist economy brought about an unconstrained environmental exploitation that changed the situation altogether. The symbiotic relationship now became a destructive one, that gave rise to large scale environmental degradation. But Kasa was basically talking about the situation of Europe. Was it the same elsewhere? Then what was the situation in the colonial world particularly India? What brought about a similar watershed in the ecological history of the Indian subcontinent? Let us discuss this in the context of Indian forest. In this portion, we'll try to portray the terrible impact of Colonialism vis-à-vis the Industrial Revolution in the West over Indian forestry, and the major objective of the colonial state behind the forest encroachments and protections.

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### Colonialism and the timber trade: The ecological watershed of Indian forestry

Before we plunge on to the history of colonial exploitation of Indian forests, let us have a quick look on how was the scenario in the pre-colonial times. Now, historian Madhav Gadgil and Ramchandra Guha argued in their monumental work, "This Fissured Land", that the relation between man and nature in pre-colonial India was overall a cordial one [2]. One can go across the pages of Ancient *Vedas* and *Aranayakas*, to see how Environment or the natural world developed a pristine relationship with man. There were strict mentions of laws in the Arthasasthra and in Ashokan Edict about protecting forest resources. However, that doesn't mean pre-colonial India doesn't exploited nature and its resources for their own betterment. For example, all the way through ancient and medieval India, hunting was considered as a royal sport and training activities. Mention of hunting wild animals like lion, elephant, tiger, and rhinoceros have been found in the coins of Gupta and Kushana Emperors. The practice continued in medieval ages too. The Mughals on their part, along with their native allies, indulged in the largest amount of hunting activities. The well-known Mughal hunting systems of Qamargha & Shakhbandh deserves special mention among their most practiced military training activities [3]. Not only hunting, but the pre-colonial Indians also used to harness the environmental resources for various other day-to-day needs. From collecting woods as a supply of fuel to acquiring animals for war craft, forest products were a

part and parcel of the lifestyle [4]. Nevertheless, it was still not a destructive one, since the population on the whole, was very limited, so was the demand and scope for exploitation. Man and nature thrived symbiotically and a systematic balance persisted.

But since the 1800s with the coming of the colonial economy, there was a paradigm shift in this situation. The Industrial Revolution in the West revolutionized the production system. Coupled with it was the new Renaissance philosophy that changed the God centric way of thinking to an anthropocentric way of thinking. Previously humans fear to disturb God and its natural component. But the new light of thinking placed man in the centre of universe and bestowed it with the power to control and stimulate the nature according to his own well being. Thus, begin a new age of Environmental exploitation.

Meanwhile, by 17th century, in order to sustain the fast growing industries, the steady supply of natural resources was necessary. Not only raw materials but also fuels including coal and wood were also of high necessity. Again, Industrialization gave birth to new avenues of income while increasing modernization led to a betterment of lifestyle. These two factors indirectly resulted in a sharp increase of population, which in turn simultaneously supplied the excess labor needed for the industrial production. As several studies showed, from 1700 onwards Europe experienced a steep rise of population. This population explosion in turn raised the demand of more products.

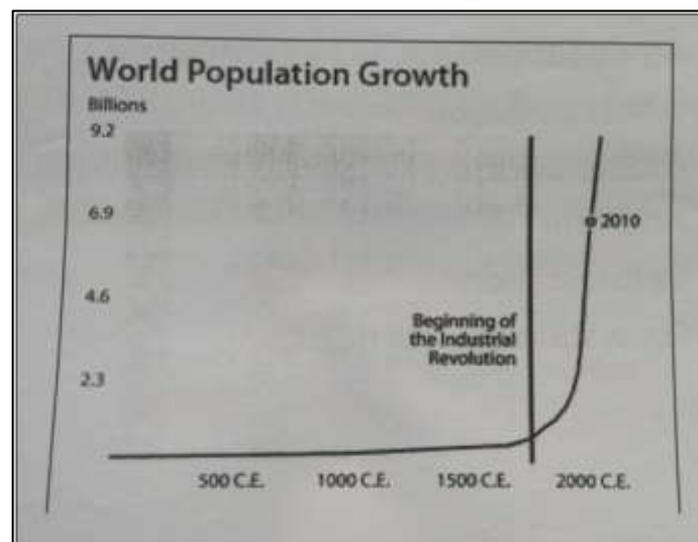


Fig 1: Population boom after Industrial Revolution [5]

But the resources of Europe was limited and by the end of century it is already showing signs of depletion, particularly its timber resources. For example, during the 18th century, much of Europe's timber supply used to come from the Black Forest of Germany. But due to reckless timber felling, as various reports suggests, by the beginning of 19th century extensive areas of Bavarian and Wurttemberg forests were already devastated. Similar were the conditions of other forested areas in England and Netherlands. This created a great uneasiness among the timber traders and a disastrous rise in timber prices was anticipated, resulting in prompt restrictions by various governments over timber felling operations. [6] Moreover, the fact that timber takes many years to attain marketable size, reduce the interest of investment by timber capitalist in systematic plantation industries also.

Nevertheless, to sustain the rising demand Western Industries, ready supply of timber was imminently necessary. Hence, the European powers now ventured for their colonies of east to sustain their industrial boom. By 1850s after almost devastating the forests resources of Ireland, South Africa and US, it now turned towards its most lucrative colony of India. Thus, began a large scale drain of Environmental resources from India to Britain. As, early conservators of forests like Sir Henry Cleghorn wrote ~

“Of all the European nations, the English have been the most regardless of the value of forest (in their colonies)” [7]

Since the age of Geographical discoveries, India was viewed, as a vast reserve of natural resources, which can be exploited at will, whenever necessary. For centuries, the West had cultivated this vision of India's vast natural wealth locked in

its dense forests. Dadabhai Naoroji in his pioneering work "Poverty and un-British rule in India" (1867), explained how millions of wealth was systematically drained out by Britain from India, ever since 1800. India gradually became a chief supplier of raw materials and natural resources for the British industries in England, while India herself became a market for cheap finished products from the former. Moreover, this large scale communication and transport of commodities required an enhancement of trans-oceanic commerce that in turn led to a boom of ship building industry. Not only just commercial vessels, but also adequate numbers of military ships should also be manufactured, in order to guard and protect this naval thoroughfare. After all, the safety and continuity of the Empire depended on its 'wooden walls'. Now, where do the vital woods for this huge shipbuilding industry come from? Surely, it is not possible for the depleting European forests to sustain this huge demand. Thus, as expected, it was the Indian forests that now became the primary supplier for this commodity. An indication of this data can be proved by the increasing amount of timber procurement for the British merchant ships. While in 1778, the annual procurement was 12.78 lakh tonnage, in 1860, within a span of roughly 80 years it increased to 49.37 lakh tonnages of timber. Contemporary scholars like EP Stebbing pointed out that the Indian soil provides some of the most durable timber in the world, which can withstand years of sailing in the saline Oceanic waters.<sup>[8]</sup> Thus, as the timber resources of Europe depletes, the permanent supply of durable timber for the Royal Navy started coming in from India alone. Again, from the 1850s another new thrust for timber supply came with the introduction of Railways. From transporting commercial goods to and from the interior to troop movements, railways became an important component behind the sustenance of Industrialization. It was introduced in India in 1853 and thereby revolutionized the process of communication in the subcontinent. But, behind this apparent symbol of prosperity there is also a negative side. One of the primary building units of railway tracks are good qualities of sleepers. Now, these railway sleepers at that time were built solely from wooden blocks. Hence a large amount of trees were started to be felled down in the various forested parts of India. As the pace of the Railway tracks rose by leaps and bounds, from 1349 km in 1860 to 51,658 kms. in 1910, so was the onslaught on forest. Both European and Indian private contractors were engaged and large amounts of trees were slaughtered, some of which were simply left to decay in the ground as unused excess<sup>[9]</sup>. Again, whatever be the quality timber does not have a long durability and most of these timber sleepers could last only for 5-6 yrs. So, not surprisingly an equal amount of faunal resource was exhausted to replace the older ones.

Moreover, the British wanted to revolutionize the land revenue of her Indian colony. They wanted a massive increase of agricultural revenue in order to sustain their infrastructure and administrative framework here in India. But for this expansion of agriculture, bringing about new forested land within the realm of agricultural sector is necessary. All this necessitated the clearing of large tracts of forests. This is best reflected in the frontier provinces of Punjab & Bengal. In Punjab, the British gained access to its Indus flood plains after defeating King Daleep Sing in 1849. The Revenue Department, which moved immediately behind the army quickly, surveyed down the entire land and reported the immense possibility of agricultural output and hitherto

fiscal profit in the region. Soon by 1850s the British built up a elaborated network of irrigation canals and communication lines to encourage agriculture. As situation improved, more agricultural settlements sprang up in Punjab & the rural population rose up steadily<sup>[10]</sup>. Quiet naturally, the pressure of this sudden Agricultural expansion automatically fell on the little amount of forested lands still left in the province and its nearby Tarai region. Without any proper planning or direction, the woodcutters and the agriculturalists began indiscriminate cutting of trees, partly to gain new agriculture lands and partly to get ready supply of charcoal and timber as firewood. Sometimes the villagers used to burn the dry seasons' grasses to make way for new lush green grass in the monsoon season for their livestock. This practice proved to be more detrimental since often these fires would spread to the adjacent forests thereby causing massive forest fires in the woodlands<sup>[11]</sup>. Hence, all these led to an age of destructive forest encroachments in colonial India.

### **Scientific Mapping and Forest Laws: A new tool for Environmental exploitation in colonial India**

However, for exploitation of the environmental resources, one primarily needs to have a first-hand knowledge of the entire land and the distribution of its natural resources. For instance, not all the trees in the forest can supply good timber for construction. Only certain species like sal, teak, mahogany, deodar, etc. could provide long lasting usable timber. Therefore, you need to have a knowledge of which faunal resources gives better varieties of timber, and in which region were they found. But the British at that time were completely foreign to this new land of 'Orient' and the past Medieval and Ancient datats of its natural world were not systematically arranged and quiet limited on the whole. So altogether, they need a fresh understanding. Hence, begin a new drive of scientific surveys that led to the enlisting and documentation of the entire environmental map of India. In this context, already in 1767, the Survey of India was established. By the start of 19th century, it embarked on large scale surveys and explorations all across India. Even high Himalayan mountainous points weren't left untouched. Large finance and manpower were invested there. Among them, the Great Himalayan Survey and the Cashmere Survey of 1850s and 1860s deserve special mention<sup>[12]</sup>.

But the most important among these was the establishment of the Indian forest department in 1864. D Brandis, also known as "Father of Indian Forestry", became the first Inspector general of Forest. In the name of 'Scientific Forestry', the forest department quickly surveyed down vast distribution of forestlands in India and documented the details of natural resources.<sup>[13]</sup> Not only timber, but also other resources like occurrence of medicinal plants<sup>[14]</sup>, distribution of wild animals, minerals, etc. were also noted down. Now on the cards, were the three Forest Acts, viz. 1<sup>st</sup> Forest Act (1865), 2<sup>nd</sup> Forest Act (1878) and 3<sup>rd</sup> Forest Act (1927). It completely changed the approach of the state towards the forest and completely brought down the latter under the super vision of the Government.

### **By the act of 1878, all the forests were divided into three categories, viz**

- i. Reserved Forest (used by the state to harness natural resources)
- ii. Protected Forest (temporary reserved by the state for future use)

iii. Village/Community Forest (could be used by the local populace)

As to Ramchandra Guha and Madhav Gadgil, it has various far-reaching implications. Firstly, it led to complete monopolization of the forest by the state. Secondly, it led to the commodification of the forest and its resources <sup>[15]</sup>. Moreover, for centuries various forest tribes living beside the forest developed a symbiotic lifestyle with the latter. Their livelihood and way of living was entirely dependent on Forest. Despite several odds, these rights were never challenged by the outsiders, for so long. Nobody interfered between them and their forest. But, suddenly within one night, all their movements in the forests were restricted by the colonial state. From now on, they would be highly penalized and brought to jurisdiction for maintaining their age old livelihood. These led to serious misbalance among the tribal communities, sometimes leading them to violent rebellion and conflict.

The forest department and the survey of India jointly undertook a thorough examination of all the Indian Forests. Scientific surveys encompassed all the timber resources along with the other parameters like soil, climate, ground water level, etc. that influences the growth of trees. The surveys were chiefly business oriented. Thus, plain availability of timber doesn't necessarily testifies the good fortune for timber industry at a particular place. Hence, along with the natural stakeholders, other economic parameters like the local available market for timber and the amount of locally available cheap labors were also examined. Last but not the least is to study the nearby lines of communications, the roads and the waterways, which could be used for the transport of timber.<sup>[16]</sup> Thus, within years, the whole timber map of India became ready in front of the British Investors and scientific plunder of the Indian forests would soon

receive a new acceleration. By 1899, the area of Reserved government forest in various British provinces of India aggregated to about 84,148 sq miles which is larger than even the total area of the English Island. In addition, about 36,500 sq miles of supplementary area comes nominally under Protected Forest category<sup>[17]</sup> However, as told earlier, this apparent conservancy of forests was not meant for its safeguard but to keep it reserve for the colonial exploitation. Nevertheless, out of the three categories of forests, it was the reserve forests that formed the most trustworthy faunal resource for the colonial establishment to supply the requisite timber chiefly for the railways and shipbuilding industries.

The final outcome of all of these was the wide spread exploitation of the forest by the colonial government and their landed intermediaries. Forests were cleared recklessly to supply of timber for railways and shipbuilding industries. In Madras Presidency alone some 35,000 trees were felled for railway sleepers. With increase of population, as more amount of investments were put on railway construction, the pressure on the forest also increases. Berthold Ribbentrop, who served as the Inspector general of forest (1885-1900), himself reported how within the reach of railways, forested areas started disappearing with incredible rapidity <sup>[18]</sup>. The story was almost same for the forest of Western Konkan coast, which on the other hand became a permanent supply of timber for British ship building industries. From 1870s forests were thrown open to private timber enterprises of Britain, that farther accelerated the process of forest exhaustions. Now, as a matter of fact, the major source of revenue for the forest department was by selling its timber resources. Even private enterprises acquiring timber with due permits had to share a part of their profit to the forest department. Thus, a rough idea can be gained from the steep rise of revenues earned by the forest department during this period.

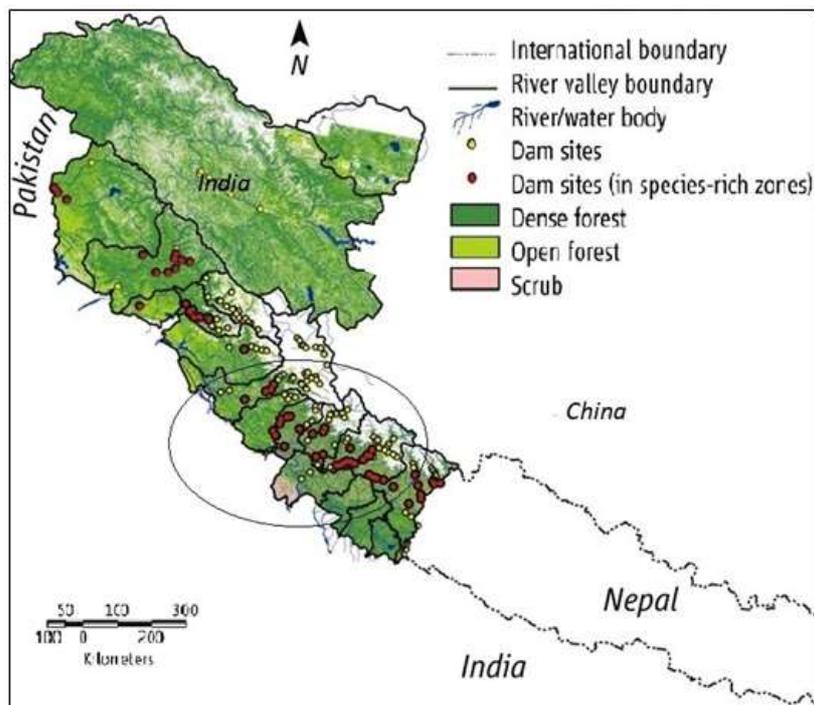
**Table 1:** Financial report of forest Department for the period of 1898-99 <sup>[19]</sup>

Category	Amount (in rupees) [approximately]
Annual Revenue (chiefly from timber)	190 millions
Annual Expenditure	100 millions
Surplus / Profit	90 millions

In this connection, mention may be made of the forests of the Northern Himalayan river valleys, which provide good qualities of deodar timbers. Now, timber takes many years to attain marketable size and thus trees are required to grow in volume to a specific age to yield the maximum financial gains. Inspector general of Forest Department, Dietrich Brandis reported that the coniferous forests of the North Western Himalayan river valleys had a short rotation period of 50-70 years and thus attains marketable size quiet earlier than the normal oak evergreen trees of the plain land <sup>[20]</sup>. Hence, these coniferous forests were more profitable for the timber capitalists. In this context, as early as 1851, the Strachey brothers, viz Richard Strachey <sup>[21]</sup> and Henry Strachey <sup>[22]</sup> had already located this resource in their West

Himalayan surveys. While surveying a large stretch of land from Kumaon to Western Tibet, in separate missions they reported that the lower downstream banks of river gorges like Beas, Sutlej, Chenab, Ganges, etc, mainly in the Siwalik foothill regions, contains highly fertile depositions of River sediments.

Hence, these banks were generally guarded by a dense cover of forest, which host some of the richest timber resources of South Asia like sal, pine, teak, deodar, etc. In fact, as certain sources suggest, that it was due to Sir Richard Strachey's keen interest and recommendation in this regard that led the then Viceroy to establish a separate forest department for handling this business <sup>[23]</sup>.



**Fig 2:** The Forested regions of North Western Himalayas, surrounded by River Valleys. The encircled portion was the major region of colonial timber collection in this sector [24].

Among the fine timbers of these Himalayan River valleys, Sal & Deodar became the chief supplier for Colonial Timber Industry. Sal (*Shorea robusta*) which was resistant to white ants and corrosion was a durable timber. But by 1860s due to excessive exploitation and agricultural expansion the Sal forests of the Outer Himalayan foothill regions began to disappear. However, deodar (*Cedrus deodara*) which grows at a higher altitude in the interior River gorges of Yamuna, Beas, Sutlej and Baspa was still abundantly available. Hence, the bulk portion of Railway sleepers began to be supplied from the Deodar forest of these Himalayan River Valleys [25]. The demand increased rapidly as the British undertook vigorous project of expanding Railway Communication in North Indian Plains, in the aftermath of 1857 rebellion. Although, initially the major supplier of timber for Indian Railways were the Teak forest of Western Coast (Bombay Province), but soon for valid reason, supply of timber from those region did not seem to be logically feasible. Partly it was because of the distance and cost of transportation to North India and partly because of the fact that the timber resources of Western Coast were already showing signs of massive depletion [26] due to indiscriminate cutting of trees. Thus, from the latter half of 19th century, to construct the Railway lines of North India, the railway builders and contractors now turned towards the vast Deodar reserves of the West Himalayan River Valleys. Between 1869 to 1885 alone around 65 lakhs Deodar sleepers were supplied from Yamuna river valley [27]. As a result, it led to a large scale of deforestation and in various places caused a complete misbalance of the biosphere. Not only the hillside, but this also affected the areas in the lower downstream of the river. One interesting report shows how after 1846, in the then Hoshiarpur district of undivided Punjab, large-scale timber cutting led to wide spread deforestation in the Siwalik hill slopes of the Beas and Sutlej river valleys. As a result, the loose soils of the hillsides were no longer protected by the vegetation cover and subsequently this led to large-scale denudation. The result was occasional landslides and large

amount of loose sands and gravels were drained into the river water, thereby choking the riverbed. The rivers responded by over flooding its lower course and laid waste to about 70,000 of fertile plain lands by depositing these excess sediments. As the cycle continues, almost 940 villages in its lower course lost their fertile lands [28].

In fact, the fear of possible devastating consequences of this forest destruction occasionally comes in the records of various contemporary forest officers also. Ribbentrop laments about the absence of the dense forest cover that once used to adorn the country during the days of Alexander. While on the other hand, Dietrich Brandis warns about the possibility of an increase in seasonal droughts on the absence of this forest cover [29]. Although the concept of global warming or environmental degradation haven't yet arrived in the academic scenario, but the early British foresters were well acquainted with the harmful side effects that this timber exploitation is going to invite in the near future. Despite this, there were hardly any signs to check this reckless deforestation.

**Table 2:** Decline of Indian Forest cover (in percentage)

Years	Percentage of forested lands
1800 BCE	86%
Before 1700 CE	66%
1947	27%

**Attack on the tribal cult of Environmental preservation and the role of Christian Missionaries**

As to Ramchandra Guha and Madhav Gadgil, the colonial forest and environmental policy has various far reaching implications. It eventually led to complete monopolization of the forest by the state [30]. For centuries various forest tribes living beside the forest developed a symbiotic lifestyle with the latter. Their livelihood and way of living was entirely dependent on Forest. But, suddenly within one night, all their rights were overthrown and their movements in the forests were severely restricted (or strictly forbidden in some areas)

by the colonial state. These led to serious confusion among the tribal communities.

Although, the tribal groups of India didn't have a monolithic identity, but to them the natural world was God centric. Worshiping forest and its resources was the basic element of the tribal totemic religions in India. Eg. The tribal group Miris of Assam considered the jungle to be the abode of Lord Jama Raja and the residence of spirits. This should never be disturbed. For centuries, these beliefs led to a deep rooted idea of preserving the nature and its resources among the tribal communities. A detailed survey by ET Dalton revealed how these totemic practices of the tribals were influenced by the traits of Hinduism and Buddhism.<sup>[31]</sup> Nature worship was an important part of their religious ritualistic practices. They put God in the center of the universe who controls every natural forces. Man can only pray to God for betterment, but have no right to change the set up of His world. Not only could they disturb His world, but as a member of a pious tribal commune it is the duty of their every man and woman to protect and preserve this "world of God" from outside encroachment.

As a matter of fact, this tribal world view became too detrimental with the very founding policy of Environmental exploitation, of the British colonial state. In this context came the Christian Evangelical missionaries as an apparent aid for the state. Since 1845, the missionaries were making steady inroads among the forests of Central and North Eastern India. However, this wasn't the old Christianity of Medieval Europe. As to the words of R. Upadhyay, it was a post Reformation "Enlightened Christianity" carefully funded by the state agencies<sup>[32]</sup>. They brought about an extreme anthropocentric idea, which was exactly opposite to the tribal

order, where there was one universal God, and He doesn't reside in the forest. Humans are His supreme creation and as such enjoy every right to change and alter the natural world, for their own betterment. They have absolute right to enjoy the natural resources for 'the greater good of mankind'. Therefore, in the pretext of proselytisation, their main target was to change the cognitive and cultural understanding of the tribal mindset. They successfully used religion to expand their hegemony among the tribal masses. From organizing health care facilities to educational institutions, the missionaries implemented various tactical methods to overtake the tribal communities and by the beginning of 19th century, they were making steady inroads among the tribal domain, particularly in Central Provinces and Chotonagpur area. The nexus between them and the colonial state was not direct but indirect. In the words of Lord Halifax "Every additional Christian in the tribal region is an additional bond of union...an additional strength to the Empire"<sup>[33]</sup>.

The colonial establishment and their capitalist economy in course of time became heavily relied on the supply of large amount natural resources particularly timber from India. However, they also knew that as long as these Environment centric belief systems of the tribes persisted, forgot about timber collection, they couldn't even enter the tribal infested forest lands. They have to face violent opposition from the tribes. Hence, the activities of the Christian missionaries gave them an ideological justification to encroach their forest domain. Now, not only could they clean up large tracts of forestlands, but they also obtained cheap labor from the forest tribals for implementing their imperialist infrastructural works including laying of railway tracts, out of the same timber collected from their own forest.

**Table 3:** Major Tribal Uprisings

Sl. No.	Name of the resisting tribes	Year(s)	Area(s) Effected
1.	Chuar	1768 and 1832	Nanbhum and Barbhum
2.	Bhills	1818 and 1848	Khandesh
3.	Hos	1822 and 1832	Singhbhum (Chotonagpur)
4.	Kolis	1824, 1839 and 1844-48	Sahyadri Hills (Maharashtra)
5.	Kols	1831-32	Chotonagpur
6.	Koyas (Rampa Rebellion)	1922-24	Rampa
7.	Khonds	1846-48 and 1855-1914	Kandhamal forest (Orissa)
8.	Saothal	1855-56	Rajmahal Forest Hills
9.	Naikdas	1858-59	Panchamahals
10.	Munda	1899	Chotonagpur Forest
11.	Oraos	1914-15	Chotonagpur Forest
12.	Kachanagas	1882	Assam <sup>[34]</sup>

However, this act of the colonial state didn't escaped away unresented. Time and again, various Tribal communities recognized this hidden motive and put violent resistance against the colonial state to preserve their forest lands. In the words of a contemporary British general Frederick Roberts, "Amongst the causes which have produced discontent of late years, I would mention our forest laws and sanitary regulations...desirable as they may be from financial and agricultural point of view, have provoked very great irritation in many parts of India<sup>[35]</sup>."

Mention may be made of the famous *Ul Gulan* Movement (1899) of the Munda tribes of Chotonagpur Jungles led by Birsa Munda. He complained about the missionary-state ill nexus and asked the tribes to throw away their Christian identity, return back to their old totemic beliefs and violently resist any colonial encroachments in their forests. Not only

did they attacked and destroyed the establishments of government and their non-tribal Indian

Intermediaries (Zamindars and *dikus*), but sometimes also attacked the Church establishments. Mentioned above are the lists of some similar tribal rebellions, where the colonial encroachments in the tribal forests were violently resisted by the tribes. The frequent occurrence of these tribal rebellions thus somewhat testifies the deep-seated resentments among the tribes against the colonial forest exploitations.

### Conclusion

Thus, Colonialism brought about a paradigm shift in the environmental history of Indian forest. It was propelled by the Industrial Revolution in the West, which created a massive demand of natural resources, and raw materials worldwide. One such primary commodity was timber. But the depleting forest cover of Europe failed to sustain such huge

demand of timber for their home industries. Hence, soon India and its forests became the new supply house of timber for the Western Industrial ecosystem. By the end of 19th century, under the disguise of scientific forestry, the British colonial administration promoted indiscriminate felling of trees to supply timber chiefly for the expanding railways and shipbuilding industries. This led to serious depletion of the forest cover and biosphere in India. The ecological balance was therefore simultaneously disturbed, leading to large-scale soil erosions and reduction of rainfall in some places. The exploitation of timber among the Coniferous forests of the North-Western Himalayan river valleys deserves special mention in this connection.

The colonial forest policies also formed a watershed in the age-old man and nature symbiotic relationship in the subcontinent. Under the garnish of 'forest protection', all the pre-existing set ups and rights were denied and the Indian Forests with their timber resource became only a 'commodity' for the colonial administration. As Dr. Dietrich Brandis, former Inspector General of Forest, wisely encodes, "(Forestry in India) is a business, which is based more upon mathematics than upon botany."<sup>[36]</sup> Forests from now onwards, would be reserved only for the future exploitation of the colonial ecosystem.

At the receiving end of this new set up however, were the indigenous tribes. For so long they had maintained a close relationship with the resources of nature. But suddenly all their rights were withdrawn. Not only so, their age-old cultural affiliations to mother nature were also challenged. That brought about a serious confusion in the tribal ecosystem leading to armed confrontation in some places.

However, at the end, it becomes necessary to ask one pertinent question that what should have been the ideal solution under such circumstances? As such, it is truly a case of horns of a dilemma. Neither one can stop the process of industrial development nor one can deny the drastic impact of rising environmental degradation in the pretext of 'modernization' and human betterment. Indeed, we can't halt the expansion of railways nor can we stop the progress of infrastructure development only for the sake of environmental reservation. But in doing so if

we invite depletion of our forest cover and disturbing the ecological balance, the result would be more severe. Thus, what we can do is to ponder about an equitable way out. Government and other establishments should undergrew an immediate balance between development and environmental preservation; otherwise, it would result in a complete dislocation of the natural balance. And it would be us who would be the prime sufferer. So we should harness on a balanced policy of what we call "sustainable development", where human development can go hand in hand without destabilizing the environmental ecosystem.

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