



ENVIRONMENTAL HISTORY OF DEFORESTATION: A STUDY OF RAILWAYS IN SOUTH INDIA (ANDHRA), 1850-1900

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ABSTRACT

History of railways has been one of the important aspects of modern Indian history. Undoubtedly railways in India generated far reaching impact on various domains of India. This paper looks at ecological dimension of Indian railways and proposes that railways were responsible for heavy deforestation by the way of consuming massive quantum of woods for sleepers and fuel. By focusing on South India this paper argues that the railways were one of the important forces responsible for evolution of forest policies. History of deforestation induced by railways is important to understand the ecological costs and evolution of policy formulation for management of forests in modern India.

Key Words: Forest Policy, South India, Deforestation, Colonialism, Railways

Introduction

The nature of colonial rule and the transformation of socio-economic and political structures brought about by it in India has been centrality of modern Indian history. The historical versions of modern India are largely conditioned by ideological affinity of historians. In spite of rigorous debate, there has been a broad agreement among historians that colonial rule indeed initiated a transition which integrated India with modern world system. In the process, the changes brought about by railways have been an important narrative in the fields of economic, social, political and environmental histories of modern India. In the recent past, historical writings on the impact

of the British rule on the environmental conditions of South Asia acquired significant prominence. In the historical narratives of environmental history, colonial forest histories constituted an important theme. The impact of railways on depletion of forests has been a focal theme of colonial forest history in South Asia. It has been proposed by colonial forest historians that introduction of railways exercised significant impact upon the forest landscape and forest management policies in India. This paper attempts to document the history of deforestation induced by the railways and its impact upon forests policies of in South India with particular reference to Andhra region.

This paper has been organized into three sections: first section proposes approaches to study the impact of railways on Indian forests: second section narrates the process of impact of railways on forest landscape of India, in general and South India with particular reference to Andhra region in particular and third section presents a brief note on evolution of forest policies on account of railway in India in general and South India in particular. The main objective of this paper is to construct a historical trajectory of changes brought about by railways on forests on India and their impact upon the evolutionary pattern of forest management policies at different levels i.e., all India, provincial and district levels.

I. Railways and Environmental History

The impact of railways on Indian society has been a contested issue in Indian historiography. The nationalist historians in colonial India highlighted the logic of introducing railways at the cost of important sectors like irrigation and welfare policies.¹ It has been argued that railways were introduced to benefit the interests of capitalist class of Britain rather than Indians.² Echoing similar tone, left historians of modern India argued that railways are mechanisms used by colonial state for speedy exploitation of resources from hinterlands to ports. Railways were perceived as one of the features of global expansion of capitalist exploitative system which has the main aim of profit maximization.³ It has also been proposed that railways undermined the supply of food availability on account of their ability to transport raw material from India to international markets. On this point Irfan Habib proposed that: ‘the railways seriously reduced food supply available within the country in times of famine by moving large amounts of food grains to the ports for export’.⁴ In contrast to nationalist and Marxists approaches neo-colonial historians argue that railways provided socio-economic mobility thereby integrating India as a

vibrant economic space with international market. It has also been proposed that socio-cultural mobility of Indian society was greatly facilitated by railways. In fact the emergence of Indian nationalism was attributed to the railways which believed to have facilitated the process of exchange of ideas among various provinces of India.⁵ These studies mainly focused on the economic, social and political impact of railways on Indian society. These studies however did not focus on the ecological costs inflicted by railways as it was out of their reach on account of absence of ecological consideration at the time they framed their argument.

The ecological dimension of Indian railways during colonial period has been explored by colonial forest historians. Attempt has been made to document the factors contributed for ecological degradation in general and forests in particular. Among several factors, it has been proposed that railway network was the main culprit in changing the morphology of Indian forest landscape by the way of unleashing speedy exploitation of timber trees. The main argument put forwarded is that railways in India were constructed and operated with enormous cost of forest resources. It was this process according to Ramachandra Guha was mainly responsible for depletion of vast forest landscape of India.⁶ Initially railways consumed massive quantum of forest resources and subsequently this process resulted in timber famine which threatened the existence and efficient function of railways. The process of evolution of forest policies and management introduced by colonial state according to Ramachandra Guha was actually response to the timber requirements of railways in India. Destruction of forests on account of construction of railways-documented by Guha- mainly concentrated on macro level (all India level) process.

The process of deforestation induced by railways in different regions has been documented by some studies. It has been proposed that forests of several regions of India were brought under exploitive process to meet the timber demands of railways. The following regional level studies demonstrated the impact of railways on exploitation of forests: Utrakhand region by Arun Agrwal,⁷ the region of Maharashtra by Neena Ambre,⁸ in Central India by Mahesh Rangarajan⁹ and Sumit Guha¹⁰, Bengal region by K. Shivaramakrisnan,¹¹ in Hymalayan region by Chaten Singh,¹² and Vasant Sabrwal,¹³ in Hyderabad by Abdul Taha¹⁴ and in Sarvananan¹⁵ and Ravi Kumar in South India.¹⁶ These studies bring out empirical evidences on the patterns of exploitation of forests and evolution of forest policies in their study regions. Railways were thus perceived as significant contributor of destruction of forests and inspirer for evolution of forest

policies in India. This paper proposes that the trajectory of deforestation induced by railways could be broadened by a comparative analysis of at different levels. Attempt thus has been made in this paper to document the impact of railways on forests at different levels such as all India level, provincial level and district level to track the process of deforestation by railways from top to bottom. This exercise would certainly expand the ecological dimension of railways which has not adequately explored by the existing literature in a more concrete way.

II. Beginning of deforestation

Introduction of railways in India was indeed a land mark of the British on Indian soil. While commenting upon the importance of railway the Governor General of India at that time pointed out that: 'Railways will constitute a very noble work, replete with the highest advantages to the government and to the public'.¹⁷ During the period of 1855-1900 railways in India expanded in an unprecedented manner. The good and bad effect of Indian railway is a debated issue, this paper focus on how railway impacted upon the forests and forest policy of India.

The pioneers of environmental history proposed that deforestation and degradation of Indian environment is a product of British colonial rule.¹⁸ It has been proposed by them that railways are biggest consumers of Indian forests. According to Ravi Rajan application of continental forestry science without giving adequate attention to Indian conditions was mainly responsible for unprecedented exploitation of Indian forests. Optimum utilization of forests was justified with the discourse of public works and development of India. Forest resources were used initially shipbuilding carried on in Bombay Dockyard. Besides this, massive quantum of timber was used in construction of imperial houses, bridges, construction works of public work department, military works etc.¹⁹ Colonial rule thus undoubtedly unleashed the unprecedented use of forest resources, particularly timber trees acquired massive demand.

As a part of this process, introduction of the railways in 1854 created a massive demand for timber and compelled the colonial state to formulate strategies for sustained exploitation of forest resources. Generally the following durable timbers were used in making sleepers which are essential for construction of railway track: teak (*tectona grandis*) mainly available in Burma, central Indian forests and Malabar region of South India: deodar (*cedress deodara*) mainly found in sloops of Himalayan region: black or rose wood (*dalbargia latifolia*) mainly available in South

Indian forests and sissoo (*dalbergia sisso*) mainly available in forest of north India such as Uttar Pradesh, Bihar and Madhya Pradesh. As these woods scattered over entire Indian subcontinent, the search and exploitation gradually spread to entire Indian territories. Besides this, inferior wood also used as enjoin fuel to run railways. In fact existing literature on colonial forest policy explicitly demonstrate the impact of railways on forest policies. Expansion of the railway network in various regions of Indian subcontinent resulted in two simultaneous processes: firstly wanton destruction of forests and second, institutionalized attempts by the colonial state to secure continuous supply of wood for railway network in the form of fuel reserves and plantations. Ramachandra Guha argues that the Indian Forest department was established mainly to provide the wood requirements of the railways.²⁰

Introduction of railways, deforestation and institutionalization of forest conservation in the form of establishment of forest departments had explicit linkages in British India. Regarding the changes brought by the introduction of the railways in the forest landscape of India, Colonial Pearson wrote that ‘As soon as mutiny was suppressed, the railways were taken in hand and the timber merchants and sleeper contractors raided the forests for timber felling trees wherever they liked. It was only necessary for contractors, weather European or Indian, to obtain *Parwana* orders from authorities to cut timber for him to set work, in that context formation of the Forest department was happened’.²¹ Railways in fact instituted a paradigm of timber exploitation in India. This point can be captured from the following quote of Dr. Lyons who gave testimony to Select Committee on Forestry:

When the railways were first made there was an immense demand for sleepers, and contracts were given to go, without any proper control, into the government forests and cut timber. The contractor went in and cut everything straight done leaving nothing by which forests could reproduce itself. They destroyed a great deal more than they wanted, as they did in America? Very likely they did; but wherever they went they cut straight down, not leaving enough for reproduction. Does not the discriminate cutting of timber by unskilled hands cause an enormous destruction to the standing timber.²²

The history of forest policy in the Madras Presidency shows the process of deforestation induced by railways at provincial level. After 1860s district collectors regularly reported upon the indiscriminative destruction of tress for sleepers in the Madras Presidency.²³ They reported to

higher authorities upon the exploitation of forests and pressed in for measures to regulate the cutting of trees.

Railways in Madras Presidency

The construction of railway tract was undertaken by the Madras Railway Company. The first railway line from Madras to Arcot, 65 miles was opened to the public in July 1856. The railway network system in the Madras Presidency belong to two systems i.e., the Madras Railway Company and the South Indian Railway Company. The total length of the Madras Railway Company by 1890 was 889 miles. The total length of South Indian Railway Company was 909 miles by 1891. Therefore, the total length of the railway in the Madras Presidency by 1891 was 1798.²⁴ The railway in South India, almost exclusively depended upon forest resources in two ways: durable timber for construction of track in the form of sleepers and inferior wood as enjoin fuel. Thus, introduction of railway created a new paradigm in utilization of forest resources and accelerated the process of deforestation.

The magnitude of deforestation induced by railway construction in India can be estimated at three levels i.e., all India level, provincial level and district level. For so doing the estimates made by Dr. H. Cleghorn, first conservator of forests in Madras Presidency, and E.P. Stebbing, forest historian of British India are used. The magnitude of deforestation expressed by Dr. Cleghorn, in 1859 as follows: ‘There were many causes at work which are gradually thinning the racks of our indigenous forests of the Madras Presidency, the first and by far the most formidable of these being railway requirements. It is scarcely credible the many thousands of large forest trees which have been felled in the neighborhood of the various line of railway within the past few years’.²⁵ He estimated that each mile of the railway track constructions requires 1760 sleepers, measuring three cubic feet of wood, which would last effectively for 8 years. In addition to this, maintenance of railway track as pre his estimation requires at least 220 sleepers for each mile or 22,000 sleepers for every hundred miles annually.²⁶ He suggested that to meet this demand, government should initiate extensive plantations in the Madras Presidency as well as other parts of India.

E.P. Stebbing one of the prominent historians of forest history in British India documents the nature of demand for wood generated by railways. As per his estimation the construction of railway track requires 20,000 tons of durable wood for every fifty miles.²⁷ If we apply these

estimates with the expanding railway track at all India level and provincial level we can tentatively quantify the magnitude of deforestation in colonial India.

Deforestation at all India level

The statistics pertaining to expansion of railways provided by Ramachandra Guha mentioned that in 1854 the total length of railways is 20 miles and by 1900 the total length of railway tract increased to 24860 miles.²⁸ Subsequently the extent of railways by 1915 including Burma happened to be 56786 miles.²⁹ If the estimates given by Cleghorn are to be believed, by 1915 railways have consumed 9,99,43360 sleepers. It means that as many foresters proposes only three good sleeper can be made from a timber tree, about 30,000000 timber tree were used in construction of railway track. Besides, this annual maintenance of railway track consumed about 1,260,64,92 sleepers. If the estimates of E.P. Stibbing are to be believed, by 1915 railways have consumed 2, 42, 00000 tones of durable timber. These estimates suggests that massive quantum of Indian woods are exploited for construction and maintenance of railways. In fact this estimation does not include the clearance of forests for construction of railway track. This was obviously reason why Dalhousie the governor general of India who was instrumental in introduction of railways in India, was also a key figure in introduction of a separate establishment for conservation of forests in India. Introduction of railways thus crated a paradigm in utilization pattern of forest resources. Policy interventions such as issue of a charter for management of forests in 1856, creation of a separate department for management of forests in the same year, introduction of 1865 forest act and promulgation of 1878 Indian Forest Act shows the linkages between changes brought about by railways in evolution of forest governance in India.

The pattern of use of timber by railways shows the nature of colonial rule in India. The resources of India were used for expansion of colonial capital accumulation. At the same time, railways unleashed the unprecedented exploitation of valuable timber tree such as teak and sal which are identified as durable timber for construction of railway track. Railways thus epicenter from which forest management emanated as a category and subsequently transformed into policy frameworks.

Deforestation at provincial level

Construction of railway tract in the Madras Presidency was initiated in the beginning of 1860s. The provincial governments including Madras were forced to respond to the demand created by railway companies for sleepers. In the absence of iron sleepers, railway track construction process in the Madras Presidency exclusively dependent upon timber. The process of deforestation in the Madras Presidency shows the nature of exploitation of forests done by the wood hungry railways.

Railway Track Expansion in Madras Presidency by 1879

Madras Railways	
Route Name	Distance in Miles
South-West line	409
Bangalore railway line	85
Nilgiri Branch	26
North-west railway line	308
Bellary Branch	32
Total running miles	857
South India Railway	644
Total number of miles	1521

Source: Board of Revenue Proceedings, Madras, 8th April 1879, No. 919, p. 3172.

By 1879 the total length of railway track in Madras Presidency was 1521 (table 2). If the statistics pertaining to the sleepers utilization pattern mentioned by Dr. Cleghorn, are to be believed, by 1879, railways network consumed 26,00000 sleepers and for annual maintenance of the railway track consumed about 330000 sleepers annually. If the estimates done suggested by E.P Stebbing are to be believed that by 1879, the railway companies consumed about 6000000 tons of wood for the railway track construction alone.

Besides the use of timber for construction of railway track, large quantity of inferior wood was consumed as fuel for railway engine. In the absence of mining coal, wood was used to run steam engines. Even though coal and other sources were used as engine fuel, but substantially railway

companies deepened upon wood as a main source of fuel. The quantity of wood used in railway in Madras Presidency mentioned by E.P. Stibbing in the following table:

Fuel Wood Consumption Pattern by the Railway Companies in Madras Presidency in tons

Items	Madras Railways		Great Southern of India Railway		Conjeveram Railways		Total	
	1867	1868	1867	1868	1867	1868	1867	1868
Coke	1,488	1,909	23	32	---	---	1,511	1,941
Coal	5,191	3,584	3,513	2,791	167	43	8,871	6,418
Patent	364	3,259	---	462	---	1	364	3,722
Fuel - wood	49,235	48,068	1,923	5,923	14	367	51,172	54,358

Source: E.P. Stebbing, The Forests of India, Vol. II. p. 103.

From the inception to till 1880s railways in India have mainly deepened upon wood as a main source of fuel (table-4). At one level railways consumed durable wood for sleepers at another level inferior wood was used as fuel. It is this pattern of wood consumption that had devastated forest landscape in India after introduction of railways which was mainly an enterprise of British capitalists for maximization of profits. Railway companies preferred wood to coal. It is because according to Campbell Walker, the deputy conservator of forests that while each tone of wood fuel costs Rs. 5 per ton and the price of coal was Rs. 20 with a co-efficient of 3.25. And an Engineer of the Madras railways estimated that by using wood fuel railway companies can save Rs. 1,00,000 per annum. This is the reason why railway companies mostly used wood as fuel for profit maximization.

In fact the requirement of the railway was one of the imperatives which the colonial policy discourse legitimized the institutionalization of forest conservation in south India. The following table (table-4) shows the source of fuel wood supply from different sources.

Fuel wood Supply from Different Sources. (in tons) by 1880

Dominions	Government	Private	Total
1. Nizam	...	2,500	2,500
2. Bellary	...	1,120	1,120
3. Cuddapah	8860	1,800	10,660
4. North Arcot	2,750	23,410	26,190
5. Mysore		850	850
6. Salem	650	10,750	11,400
7. Coimbatore	400	15,250	400
Total			15,250
	12,600	55,760	68,420

Source: D. Brandies, Suggestions Regarding the Forest Administration in Madras Presidency, 1883, Madras, p. 40.

Out of total supply of fuel wood to railways government supply constitute only 22.60%. Hence little below 80% of total supply comes from private supply. There was a systematic attempt made by forest offices to increase the share of government in fuel wood supply. In fact forest department as a professional department of colonial bureaucracy sought its legitimacy in supply of cheap wood to various government departments. Campbell Walker estimated in 1883 that railway companies may require 90,000 tons annually. Dr. Brandis who was main architect of the Madras forest act of 1882 proposed that railway may require 81,000 tons annually. And both argued that forest department needs to be strengthened to supply the wood for railways.³⁰ As Dr. Brandis inherited German tradition of forest management, wherein forests were strictly managed by the state control he advocated for government to take over forests for systematic management.³¹ By using the requirements of railways as justification factor, forest department bided for institution of centralized forest management system to meet the requirements of timber required for various government departments including railways.

Deforestation at district level

The wood requirements of railways were met from different sources and levels. Exploitation of forests and institution of local establishment of forest management took place simultaneously. This trend particularly could be seen in the district through which railway tract runs. The quantity of the fire-wood supplied to the railways from the forests in Cuddapa district shows the quantum of deforestation inflicted by railway companies (table 3).

The Fuel Wood Supply from the Cuddapah District Forests to Railway Companies

Year	Quantity in Tons	Value in Rs
1870-71	7,816	17,509
1871-72	10,214	22,881
1872-73	16,491	36,940
1873-74	17,430	3,943
1874-75	12,838	28,758
1875-76	12,683	28,441
1876-77	16,000	33,330
1877-78	22,000	50,117
1878-79	12,000	27,906
1879-80	5,000	12,000
1880-81	7,000	16,000
1881-82	11,000	26,000

Source: V.S. Krishnaswamy, Working Plan for the Cuddapah South Forest Division, Government Press, Madras, 1937, p.28.

The wood supply to railway companies was mainly provided by private agencies in Cuddapah. These agencies indiscriminately destroyed forests for quick profits. No mechanism was placed to regulate their fallings. Contractors were given free hand to exploit forests to meet the demand of railway companies.³² Due to the greed for quick profits timber contractors resorted to destructive methods of exploiting forests. The North Arcot District Collector reported that most of the valuable trees were indiscriminately felled by the railway fuel contractors and all the forests near the railway lines were destroyed.³³

As Cuddapah district has valuable timber and vast extent of waste lands, foresters tried to implement their forest management strategies. In 1856, the Conservator of Forests Dr. Cleghorn toured in the forests of Cuddapah district and recommended for their protection from illegal cuttings.³⁴ He was of the opinion that efficient forest management could be achieved by imposing

the control of forest department over forests of Cduddapah district. Subsequently most of the forests in the district were brought under the control of forest department.

III. Evolution of forest policies in South India

Richard Grove suggested that the colonial scientific community played significant role in evolving forest conservation strategies in various colonies. Particularly in India, Grove claims that colonial scientific community, botanists and forests played a crucial role in evolving conservation strategies and policies.³⁵ But the history of forest policy in India clearly shows that it was the resource requirements of the colonial economy which was main guiding force of forest policies. The linkages between evolution of forest policies and introduction of railway in India establish this fact convincingly.

In 1849 the government of India had entered in memorandum of understanding with some companies in England for construction of railways in India. Soon after this, survey of land and mapping of resources required for railway are being carefully done. In this context, forest conservation as a policy aspect of the state took shape during the time of Governor General Lord Dalhousie. He declared a systematic policy for management of forests in 1855.³⁶ This attempt was followed by various provinces with establishment of forest departments as follows: Punjab in 1855; North West provinces in 1860; Central Provinces in 1861; Oudh in 1861; Coorg in 1864; Bengal in 1864 and Berar in 1865.³⁷ These developments are culminated into promulgation of Indian Forests Acts in 1865 and 1878 to give systematic direction forest management. Forest management in India opted for strong role for state in management of forests. Accordingly forests were divided in to reserved, protected and village forests. In both reserved and protected forests state enjoys regulatory role in controlling the access of people to forests. In the course of time, most of the valuable forests were brought under the monopolistic control of the state by excluding the customary access of forest dependent communities. The following table shows the pattern forest reservation process in which most of forests were brought under the control of forest department:

Extent of forests brought under the control of forest department in India

Province	Total are in Square Miles	Area of forests on 30 th June 1893, in Square Miles
Bengal	150,727	12,808
North-Western Provinces and Oudh	107,441	3,886
The Punjab	106,613	6,052
The Central Provinces	86,501	20,014
Burma (Lower)	87,220	5,790
Burma (Upper)	77,296	27,009
Assam	45,350	10,776
Coorg	1,583	893
Ajmere	2,711	147
Baluchistan	06
The Andamans	1,989	1,956
Berar	17,711	4,236
Madras	86,380	17,187
Bombay	121,352	14,510

Source: collection of Papers Relating to the Administration in the Madras Presidency, Madras, Government Press, 1915, p. 92.

By 1890s substantial portion forests in different parts of India were brought under the control of the state after settling forests as state reserves. As Mahesh Rangarajan suggests forest department emerged as biggest landlord in South Asia by the way of monopolizing control over about 25% of total landscape of India. The lands brought under the control of forests were managed rigidly by the way of excluding the customary access of people. One of the main driving forces for this process was explicitly the timber requirements of railways.

In case of Madras Presidency from 1800-1856 forest conservation measures are undertaken mainly by district collectors. Forest department was established in 1856, Dr. H. Clehorn as conservator of forests. The necessity of systematic forest conservation measures were felt in the context of shortage encountered by the wood supply agencies for railways. In 1860 a dispatch was sent by the Secretary of State for India to the Government of India. This dispatch insisted upon the need for ensuring sustained supply of wood for railways. After this dispatch provinces have expedited attempts for creation of forest policies. The demand created by railways for wood stimulated forest conservation measures in the Madras Presidency. The exploitation of forests for railways was so aggressive that the collector of Salem district reported the Board of Revenue on the alarming situation of wood scarcity. He reported that hitherto the demand for wood by railways was 1300 tons per annum and the railway companies after 1865 increased demand to 3000 tons per annum.³⁸ Similar concerns are expressed by collector of North Arcot district. He suggested the Board of Revenue to initiate a systematic policy for conservation of forests.³⁹

After 1860 forest conservation establishments were instituted in various districts of the Madras Presidency. In Salem district, small establishment was created in 1860 to monitor the supply of wood for railways. It was reported in 1860 that the number of sleepers supplied from this district was 2,45,743.⁴⁰ In the South Arcot district, a forest establishment was established in 1861-62, with the main object of providing continuous supply of fuel wood for the railways. Five blocks in the Gingee hills and the slopes of the Kalarayans were selected and strict regulations were placed on peoples' access to those forests.⁴¹ In Tinnevely district, the forest tracts were brought under the conservancy rules. A small forest establishment was started and kept under the charge of a *Duftdar* and two peons. In 1860, the District Collector, Mr. Puckle advised that the only remedy for the destruction of forests was to place them under the charge of a special administrative establishment.⁴²

After 1870, colonial state took note on the need for conservation of forests as supply of wood for railways became difficult. It is in this context officials of forest department advocated for conservation gospel as a remedy for shortage of wood. R.H. Beddome, the Conservator of Forests commented upon the impact of railways and need for conservation that 'Railroads are utterly altering the features of the country and privileges hitherto in existence must disappear before them. The demand for timber and fuel in all districts transverse by the railways is already

so far beyond what can be looked upon as the permanent supply that is becoming an imperative duty on the part of government clearly define all rights and introduce strict conservancy for the future prosperity of the country demand'.⁴³ It is in this context that the concept of state centric conservation gained prominence.

In order to ensure continuous supply of wood for railways, the Madras government initiated the policy of reservation of forests suitable for valuable timber growth and creation of plantations. These are referred to as fuel reserves. These reserves are declared as government property and access to people was strictly prohibited. The reservation of forest for wood requirements of railways was initiated after 1865. In 1869-70, 41,479 acres or 64.8 square miles were declared as reserved forests and these areas increased by 1877-78 to 127,059 acres or 196 square miles.⁴⁴ The forest area brought under reserved forest category steadily increased. The following table shows the extent of forest reservation in different districts of the Madras Presidency.

Status of Forest Reserves prior to the Passing Madras Forest Act of 1882

Reservation of forests before passing the forests act. Districts (South Circle)	Area under reservation by 31st March 1883, in Square Miles.
Chinglepat	84
North Arcot	271
South Arcot	399
Salem	44
Trichinopoly	6
Coimbatore } North	25
} South	163
Madura	306
Tinnevelly	315
Malabar	352
South Canara	1
Districts (North circle)	
Godavary	68
Kistna	156
Nellore	218
Cuddapah	301
Bellary	14
Anantapur	51.5
Neilgheries	59
Total	2782

Source: C.D.McLean, Manual of Administration of the Madras Presidency, Vol. II, Reprint edition, Asian Educational Service, New Delhi, 1985, pp. 320-324.

From 1860 to 1880, the railway network expanded rapidly and consumed enormous amount of wood in the Madras Presidency. Though substantial wood supply was drawn from private sources, the Forest department continued to be the major supplier of fuel wood to the railways. In order to provide the wood for the railway companies, the government began to reserve forest and waste lands as fuel reserves. The total area of fuel reserves in 1869-70 was 41,479 acres or 64.8 square miles and these areas increased by 1877-78 to 127,059 acres or 196 square miles.⁴⁵ Within the span of ten years, there was an increase of 200% area under the control of the Forest department.

Area Controlled by the Forest Department for Plantations in acres

Total area of fuel reserves	123,625
Do plantations.....	<u>3,434</u>
Total	127,059

Source: Board of Revenue Proceedings, 8th April 1879, B. No. 919 p. 3171.

The above statistics shows that by 1878, considerable extent of the land neighboring the railway tracks was brought under the fuel reserves managed by the Forest department. Despite the Revenue department’s resistance, the government sanctioned the land as fuel reserves to the Forest department. The district though which railway tract runs forests were created as fuel reserves. Besides indigenous trees, tree belongs to Acacia family and eucalyptus varieties imported from Australia were planted in reserved forests wherein the monopolistic control of the state exists for plantation purposes. These exotic plantations were initially promoted in Nelgiri district and gradually planted in most of the districts of Madras Presidency. The main purpose was to promote the fast growing tree species to meet the demands of railways.

However, despite the government effort to increase the fuel wood from the government forests, the overall supply continued to be inadequate. This has created alarming situation in which railways companies expressed apprehension over the certainty of wood supplies. It was in this context that Dr. Brandis, was deputed to prepare forest act for the Madras Presidency. It was due to the fact that Madras government expressed unwillingness to adopt both 1865 and 1878 Indian Forest Acts with the argument of safeguarding customary rights of forest dependent

communities. After extensive tour to understand the physical and administrative aspects of forests of Madras Presidency, Brandis has submitted a detailed report by stressing upon the necessary to adopt forest act for systematic conservation of forests. His report which was substantially incorporated into the Madras Forest Act of 1882 justified the imposition of strict forest conservation so as to meet the wood requirements of railways. He proposed that private supplied to railways many not be sustained in the long run as conservation of timber was not their priority. He also warned the government if exploitation of forests unabated it would lead to timber famine which would hamper the progress and efficiency of railways in India.

History of forest policy in the Madras Presidency represents the broad trends in the policy paradigm in the colonial governance. While the majority officials of the revenue department wanted to leave the supply of wood to railways by private agencies or communities and forest officials opted for strict conservation of forests by the state to supply wood to railway companies. While the discourse of revenue department represents philosophy of laissez faire and forest bureaucracy which inherited the authoritarian notion of German forest conservancy ideals. Ultimately Germany policy paradigm prevailed as the colonial state wanted to translate its symbolic power as a big land lord by imposing its monopoly over vast extent of forests and waste lands. This move had catered to the needs of British capital invested in the form of railway and other industries such as plantation, iron manufacturing, gun manufacturing and etc. In 1883 the Madras Government promulgated the Madras Forest Act of 1882. And within five years of passing this act, about 20000 square miles of forests in the Madras Presidency were declared as state property and customary access of peasants and tribes was declared as illegal. The following table shows the expansion of the state control over forests in Madras Presidency:

Pattern of Reserved Forest Expansion in Madras Presidency in square miles by 1910

Year	Reserve forest notified under the madras forest act, in square miles.	Reserve lands in square miles.	Total forest cover under the control of the forest department, in square miles.
1892-93	7,174	9,403	16,577
1993-94	9,435	7,250	17,185
1894-95	11,466	7,324	18,790
1895-96	12,388	6,690	19,078
1896-97	13,138	5,796	18,907
1897-98	13,775	5,428	19,225

1898-99	14,888	4,706	19,594
1899-00	15,862	3,787	19,649
1901-02	16,589	2,952	19,541
1902-03	17,154	2,412	19,566
1903-04	17,923	1,798	19,555
1904-05	18,107	1,798	19,626
1905-06	18,228	1,297	19,585
1906-07	18,541	1,079	19,620
1907-08	18,549	1,058	19,607
1908-09	18,694	8,76	19,570
1909-10	18,769	8,76	19,570

Source: Compiled from the Annual administrative Reports of the Forest Department, Madras Presidency.

By 1910, most of the forests and waste lands of the Madras Presidency were brought under the control of forest department. These forests were designated as reserved forests to be strictly controlled by forest department by the way of excluding customary access of people to forests and waste lands. Introduction of railways thus was a major stimulating factor for introduction of forest management policies in India in general and Madras Presidency in particular.

Conclusion

The history of colonial forest policies during the period 1800-1900 in India in general and Madras Presidency in particular shows the strong linkages between introduction of railways and evolution of forest management policies. Besides this the viable trend is that colonial economic interests were mainly responsible for exploitation of forests and eventual degradation of environmental conditions. This period also shows the ability of the colonial state to forge alliance between indigenous entrepreneurial class which collaborated with colonial exploitation such as wood contractors and merchants. It is this collaboration that perpetuated the devastating effect on the forest landscape in Indian sub-continent. Most of the wood stock has been wiped out due to the wood hungry railways created for maximization of the British capital. The history of forest policies in the Madras Presidency shows the way Indian resources were used for maximization of British capitalists' interests at the cost of fragile environment and livelihood requirement of the poor in India. At the same time, this paper proposes that the crisis generated by over exploitation of timber forests also resulted in a situation in which conservation of forests was taken seriously by colonial state. Due to this institutionalized attempts were created for scientific management of forests in order to obtain sustained supply of timber supplies to

railways. Introduction of railways thus resulted in exploitation of Indian forests at one level and initiation of scientific conservation measures at another level.

Notes

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