



Review Paper

## Artificial and Natural Regeneration of the Forests of Bombay Presidency: 1838 to 1860

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Available online at: [www.isca.in](http://www.isca.in)

(Received 13<sup>rd</sup> January 2012, revised 18<sup>th</sup> January 2012, accepted 22<sup>nd</sup> January 2012)

### Abstract

Since the late eighteenth century, the Colonial government actively pursued a forest policy that facilitated rapid commercialization which led the Forest officers, timber merchants and contractors deep into the forests of India. The British systematically and legitimately exploited forest of India for the construction of ships, railways, civic construction, military and other purpose. The state of Bombay's forests in the late 1830's was highly deplorable that there was concern about supplies of timber, especially teak which were required for the Royal Navy at Bombay Dockyard for the construction of ships.. This drew the attention of the British Government in 1838 to indiscriminate destruction of the forests. In January 1840 the Bombay Government instructed Dr. Alexander Gibson, the Superintendent of the Botanical garden at Dapuri and Hewra in Poona, to make a tour of the Northern and Southern Konkan Forests. His report confirmed the Government fears of devastation and exhaustion of these forests.

The pressure of the timber needs worked to the advantage of the development of conservation policies, which resulted in the evolution of the policy of natural resource management. This finally resulted in the establishment of the pioneering forest department in 1847 in the Bombay Presidency with Alexander Gibson as its Conservator. The establishment of the forest department and the rules and regulations implemented by the Bombay Government to conserve the forests of Bombay was a landmark in the history of forestry of Bombay Presidency. For the first time in Bombay, serious effort was made towards such conservancy measures.

The paper endeavours to evaluate conservation measures undertaken by the Forest Department in Bombay Presidency under the Conservator Alexander Gibson in the period 1838 to 1860. It will throw light on the role of the Botanical gardens of western India towards afforestation. It is argued that the history of plantation for sustainable development was a result of colonial anxiety to meet timber needs and for increased revenue earnings. Forests became more of a commercial commodity than a matter of rich biodiversity to be protected from various unwanted factors although it helped in the better regeneration of a few specific timbers such as teak.

**Key words:** forests, plantation, conservation, silviculture, botanical garden, timber

### Introduction

Environment and sustainable development has been accorded great emphasis since the last quarter of the twentieth century. Forestry is one of the core components of the environment, which constitutes biodiversity. In the process of development, deforestation and denudation have become common phenomena, affecting the sustainability. In India, the magnitude of deforestation increased with the advent of the British rule. The main objective of this article is to evaluate the conservation measures adopted by the Colonial government as a response to ecological crisis in Bombay Presidency in the late 1830's. The study covers certain research questions to ascertain, how the colonial policy affected the environment? Has the conservation measures accorded due importance to the development agenda or was

the State merely interested in garnering more revenue through commercialization of forests?

The paper is based mainly on primary sources culled from the Maharashtra State Archives such as Public Department diaries, Volumes of Political, Marine, Revenue, General Department, Public Works Department (General), and contemporary literature. Other important sources for my research have been the reports of the forest department of the Bombay Presidency which gives valuable information about the topography and the floral composition of Bombay.

With the advent of the British in India, forests of India became vital necessity for the State. By 1800, the timber resources of the British Isles had been exhausted owing to

vast quantities of this timber being consumed in the King's and the private yards<sup>1</sup>. Great Britain was eager for new sources of raw materials to construct ships, especially war ships for their Royal Navy at Bombay Dockyard and for civic construction too. With the beginning of the railways in Bombay in the middle of the nineteenth century, timber was required for railway sleepers and fuel<sup>2</sup>.

The British Government commercialized the forests by establishing their monopoly over teak which eventually led the Forest officers, timber merchants and contractors deep into the forests of India. They systematically and legitimately exploited India's forests. In western India timber was supplied from Malabar, Canara, Surat, Dangs, Thana, Bassein, Ratnagiri, Konkan and Poona to Bombay to meet the timber requirements of the British<sup>3</sup>. Moreover, the nature of timber trade was such that it led to trans ecological exchanges, which further decimated the forests of India as timber was also shipped to the Persian Gulf and Arabia<sup>4</sup>. The state of the forests of the Bombay Presidency in the late 1830's was highly deplorable that it raised brows over the supplies of timber, especially teak which were required by the Royal Naval Dockyard in Bombay. This drew the attention of the British Government in 1838 to indiscriminate destruction of the forests. In January 1840 the Bombay Government instructed Dr. Alexander Gibson, the Superintendent of the Botanical garden at Poona, to make a tour of the Northern and Southern Konkan forests. His report confirmed the government fears of devastation and exhaustion of the forests<sup>5</sup>.

The pressure of timber needs worked to the advantage of the development of conservation policies, which resulted in the evolution of the policy of natural resource management. This finally resulted in the establishment of the pioneering forest department in 1847 in the Bombay Presidency with Alexander Gibson as its Conservator. The establishment of the forest department and the rules and regulations implemented by the Bombay Government to conserve the forests of Bombay was a landmark in the history of forestry of Bombay Presidency. For the first time serious efforts were made to conserve the forests<sup>6</sup>.

## Forest Conservation in Bombay Presidency: 1838– 1860

The Forest Department's control extended to the districts of Northern and Southern Konkan, the Collectorates of the Deccan and Southern Maratha country, the forests in Surat and the Dangs and Satara<sup>7</sup>. The main aim of the department was to conserve the forests and to ensure a sustainable supply of timber for the East India Company. Gibson, the Conservator of the forest department was assisted by four Europeans 'for carrying on the duties in provinces, or places so extensive as to require a separate establishment for

themselves, but proceeds to mention only three of these specifically. Two were employed for the 'Northern Branch', which had an 'office establishment, with Accountant, Measurer, and based at Surat and Bulsar and was concerned with the running of the leased Dang forests. There was also a 'Southern Branch' under an Assistant based at Sudasheoghur, where there was an office with 'an English Writer, several Peons, and (a) Measurer'. These southern forests did not belong to Bombay, but timber was brought from the Madras Government 'at cost price' through a Timber Agent and Assistant whose salaries were paid by Madras. It seems, however, that A. Poulton, the Assistant Timber Agent was considered as one of Gibson's Assistants. There was also an establishment in Malabar responsible for purchasing timber for Bombay consisting of 'an Accountant and Peons at Calicut, and a Mootsudee at Ponany'. Mr. William was appointed in 1854 to be in charge of the naval timber store at Bombay. The monthly budget of the Forest department was Rupees 293<sup>8</sup>.

## Thinning of the Forests or Silviculture

To improve and conserve the forests and also to strengthen the commercial prospects of the forestlands, the forests brought under the control of the forest department needed to be converted into a sustainable forestry. A number of recent works informs us about the complex nature of the entry of western knowledge, science in particular and the ways through which it was applied to the Indian forests. These seminal works point out how science fostered the conservation of the forest coverage and how it helped to improve the commercial capacity of timbers and preserve sustainability of timber. The colonial foresters heavily relied on these corpuses of western scientific knowledge about how to go ahead with the management of forests. Various scientific experiments were conducted inside the forests to attain this end, ever since Gibson was appointed to inspect the forests<sup>9</sup>.

Being largely pragmatic, Gibson main aim was to ensure a sustainable supply of timber for the East India Company. To achieve this objective, he initiated silvicultural techniques for artificial and natural regeneration of the teak trees. He instituted thinning amongst the young teak in the forest reserves. There were altogether over 600 species of wood in the forests of Bombay Presidency. One acre of forest contained approximately, fifty different species of woody plants, trees, shrubs and creepers. Besides these species, there was an undergrowth of many species of herbs, grasses (including bamboos), and over 100 different species of plants exist in a *coupe*<sup>10</sup>. Forest thinning is a process that involved pruning the side branches of the trees and the removal of superfluous shoots, which fuels forest fires. Weeding, thinning were silviculture practices for improving the quality of desired trees in forest for timber production<sup>11</sup>.

From the forests reports of Gibson, the earliest evidence of implementing experimental thinning of the teak trees could be traced to 1841 at Sevendrug Forest in Ratnagiri district for three seasons consecutively for three years from 1841 to 1844. He employed 50 men in thinning of the forest for three months in each year. A net profit of Rs.3,865 was secured after the sale of the wood. In Southern Thana Collectorate, partial thinning was attempted in 1848, which produced a net profit of about Rs. 850. However, attention was paid to the thinning of those forests that were strategically located near water carriage. These forests were under the supervision of two Ratnagiri Rangers along with the Conservator's peon to check the felling of timber. The thinning process was continued in the following years in several zillas such as Belgaum, Penth, Poona, Thana and the Dang region. The kamavisdar and kulkarnis, the influential village officials lend their aid to this measures of the government<sup>12</sup>. Throughout his reports, Gibson stressed the financial benefits to government of his work and took pride in it. The forest department was interested in maximizing the revenue from the forest resources by using such experimental processes. However, such conservationist measures were ultimately used to cut the forest trees for the railways, which commenced in the middle of the nineteenth century in Bombay.

### System of Forest Shares: Social Response

During his tours, Dr. Gibson found that in the villages of the Thana collectorate, the Khots(Cultivators) sublet their lands to others. The others taking advantage of Khots period of occupation, cut trees and exported to Bombay. For instance, in a village of Moorbeh, in Tulleh Petas, 2000 trees were cut and exported to Bombay. To check such depredation and being closer to Bombay, Dr. Gibson introduced the "share system" which was confined only to Thana and Poona in 1848 and 1849. Under this system, the Khots or other village heads entered into an agreement with the forest department to conserve the teak forests around their villages in exchange of permission to lop the trees for rab and take one-third or one-fourth of the net proceeds during the periodic felling<sup>13</sup>. Rab was the practice of burning branches of trees, leaves, twigs, etc., on the fields in order to create beds for sowing before monsoons. Later on when the system of "revenue survey" was introduced in these villages, the Survey Department entered into similar contracts with the Khots at the time of settlement. Later, Gibson found such forests in excellent order and the ground which were cleared for cultivation, the teak trees were grown and were carefully pruned and thinned which would be of utility for the naval department<sup>14</sup>.

The share system was confined only to Thana and Poona because the proclamation issued by Davidson Dunlop, in 1823 which vested all property in teak and other trees within his collectorate in Khots and Patels. This collectorate

included 14 talukas which included the whole country south from Karnala or Funned Hill to the Sawunt Wari border. In 1851, the Government repealed this, proclamation and provided for the grant of a share of the proceeds of the forest to all Khots and others, who should prove their claim to the same within a period of six months from the date of the counter-notice. In 1851, the Government repealed this proclamation and provided for the grant of a share of the proceeds of the forest to all Khots and others, who should prove their claim to the same within a period of six months from the date of the counter-notice<sup>15</sup>.

The ryots agreed to a share system because they fetched a share of such a system, which now formed a valuable property instead in former times trees were cut away for burning<sup>16</sup>. Gibson carried out thinning and pruning of these forest which increased the quality and quantity of timber and resulted in a good annual profit. In 1854, around 5000 sticks were thinned in cluster of villages, whereof 900 were furnished for the Telegraph and remainder sold by auction. The net profit realized after reducing expense of trimming and cutting was Rs. 831.

At times, this practice proved to be ineffective when the forests were plundered by people, which resulted in applications being made by the ryots to government for the cancelling of forest conservation-warrant in the Poona Zillah. In Konkan too, the Khots and other shareholders indulged into such misconduct. Besides, some of them had no title or usage claim to any share. For the summary of returns from the Villages in Konkan, including Khots Shares see the table no. 1. However, in the Ratnagiri Collectorate, many responded favourably for such conservation agreements. Approximately, 7000 trees were planted. Most of these plantations appeared to have been made in government "Wurkus" or hill ground and half-share secured to the planter by a written agreement<sup>17</sup>.

### Conserving the Teak Trees

The British Government was mainly concerned with the conservation of teak trees. In the year, 1850, the British Association met in Edinburgh and appointed a Committee to consider the probable effects, from an economy and physical point of view of the destruction of tropical forests. In the following year, the Committee presented at Ipswich, a report which gave importance to the preservation of trees in order to maintain an equilibrium of temperature and humidity, to prevent the disappearance of indigenous forests, and to take requisite steps for extending forest conservancy in order to ensure continued supply of valuable forest produce<sup>18</sup>.

In 1855, Governor General Lord Dalhousie circulated a memorandum on forest conservation suggesting that teak should be declared state property and its trade strictly regulated. Accordingly, an individual, without prior

permission of the Conservator was prohibited from cutting teak trees to the bottom in the village except those given as Inams or charitable gifts. Cutting of such trees was allowed only in the presence of the Conservator's staff. The Conservator was expected to ascertain and report to the government the number of trees cut. Everyone was expected to follow these rules strictly and anyone who failed to obey these rules, strict action was to be taken against the offender<sup>19</sup>. To ensure the implementation of these rules and to have a vigilance on the forests, Gibson stationed five peons, besides the other peons who were directly in such service to preserve the trees. An individual was also instructed to take care of the teak trees grown within the boundaries of the ryots village. As the ryot required the branches of teak trees for rab purpose, they were given the permission to cut the branches leaving three *tassus* from the fork of the trees and not at the fork. The extremity of the tree and the branches within three feet were not to be cut. The Government officials (collectors) were also advised to take initiative to plant trees around their offices to influence the ryots to emulate them<sup>20</sup>. The Colonial forest policy deprived the people of age old rights over forest lands and alienated them from the forests which resulted in tribal revolts in the Bombay Presidency in the nineteenth century<sup>21</sup>.

### **Afforestation: Artificial and Natural Regeneration**

It was through plantations through which the forest was modified and shaped according to the needs of the colonial forest policy. Specific trees were brought under the experiment of the plantation scheme. The move for plantation gained momentum from an understanding that the existing forest in Bombay Presidency was deforested and was falling short of the market needs, needed artificial regeneration with the help of science. Thus, both, imperial exigencies and western science came in to collaborate intimately in ushering in a new era. The experiments with plantation, both artificial and natural, required a complex interaction of colonial science and local knowledge. The direction of the former was motivated by the commercial needs of the colonial forest department and hence often came into conflict with the local system of forest management.

Botanical Gardens of Bombay Presidency: Lord Wellesley, who became the Governor General of India in 1798, was sympathetic to scientific research as he realised that financial benefit would flow to the Company from a better understanding of Natural history of India<sup>22</sup>. By the nineteenth century, the botanical gardens had become museums of living plants, and economic botany, in which they displayed useful products of vegetable origin. The botanical gardens exchanged plants and seeds<sup>23</sup>.

In India, the pioneering botanical garden, established at Calcutta in 1764, had made rapid progress under the superintendence of doctors like William Roxburgh, the father of Indian Botany since 1793 as well as Nathaniel Wallich

who succeeded William Roxburgh from 1817 to 1846<sup>24</sup>. The garden played an important role in the introduction of varieties of plants and even trees in the forests in India in the late eighteenth century which came from different parts of the globe<sup>25</sup>.

In Bombay Presidency, the pioneering botanical garden was established at Dapuri by John Malcolm in 1827 with James Williamson as its Superintendent. This institution made considerable progress under Dr. Gibson who became its Superintendent in 1837. However, the most important, and larger of the District Gardens was at Hewra where Gibson commenced plantations of Mulberry and Sugarcane in 1838. It rapidly became Gibson's headquarters, not only for the agricultural schemes, but also for his forestry activities<sup>26</sup>.

Plantations in Gibson's Garden: Dr. Gibson raised teak plantation at Hewra by sowing large quantity of teak seeds<sup>27</sup>. By 1858, Gibson was successful in raising numerous plants and trees at Dapuri and Hewra, primarily due to the supply of seeds and roots by the botanical garden at Calcutta. Gibson developed a good plantation of approximately 30 growing trees of the Mahogany at Hewra and one at Dapuri and the Sag wood and the tanning *Casalpinia* of South America "Divi-Divd" from the seeds sent by Dr. Wallich to Gibson. Besides these plantations, Thomson sent several Saul trees, out of which thirty survived. These were to become nucleus of a future plantation<sup>28</sup>. The other source for the indigenous plants were obtained in the seed form from Nasik, Kyreswur, the Konkan and Mahableshwar and for the exotics, the major sources were North America, Mexico, South America, the West Indies, China, Indonesia and Australia. For commercial plants, one of the most important sources of seed was John Forbes Royle at East India House, the headquarters of the East India Company in London. Of links with foreign botanic gardens, the most important, was with the Royal Botanic Gardens, Kew through Sir William Hooker<sup>29</sup>.

One of the aims of the arboretum was to try to persuade the 'natives' to grow trees. At the insistence of the 'natives' to grow trees near the wells, Gibson supplied teak, oranges, cypress, guavas and of shrubs, red and white rose, the annatto tree and Indian rubber fig. However, by 1854, Gibson lamented that, with the 'exception of mangoes and an occasional plant of the green champa (*Artobotrys odoratissima*) or a lime or orange tree were planted near the well with no demand for other trees'. An important role of the district gardens, as at Dapuri, was the generation of income to offset their costs by selling produce and products. In his early days, the experimental growth of Mauritius sugar cane was carried out and men were hired to train them in the art of sugar making. Gibson reported making 1454 lbs of sugar from 13,090 canes grown mainly at Hewra, and sold it as sugar and molasses in Poona for Rs. 270. A joint stock company was set up at Hewra under the management of Mr.

Dickenson. Sugar, molasses, rum, rum shrub and spirits of wine were produced by this manufactory.

Gibson successfully ventured in growing medicinal plants. As early as 1840, he successively produced Tinnivelly senna (Cassiasenna). By 1850, he supplied from 900 to 1900 lbs of sienna annually to the Army Medical Stores and also exported it. In 1854, he sent 23 bales to England, which weighed 2648 lbs and sold for L56 16s 2d making a profit of S3 6s 8d. The other important medicinal crops were Henbane, Colocynth and Dandelion, Clove, Cajaputaia, Alstonia, Aristolachia, Pterocarpus, which were also carefully maintained. The medicines were prepared in a pharmaceutical laboratory at Hewra.

Oil extraction is mentioned at length in Gibson's reports. The production of groundnut and castor oil were successful by means of Bramah's Hydraulic Press, made by Simpson & Co. of Belgrave Road, Pimlico. This machine was bought and installed at Hewra in the middle of 1842. Other seeds were also experimented in 1843. Nepal Pepper was a form of chilli, grown initially for the Bombay market. In 1859 and 1860, he sent bags for sale in grocers and druggists in London, Edinburgh and Brechin, and made a profit of S33 9s for the 'Home Treasury'. Potato was originally introduced to him into the Joonere Valley in 1837 and 1838. It was extensively grown and exported to Khandesh and Bombay in large quantities. It also afforded employment to hundreds of carts in the villages. He later experimented the cultivation of the potato by the agency of two China men he employed on their plan that is having loose ridges, high manuring, and careful earthing of the plants. The result was satisfactory, both in terms of quantity and quality<sup>30</sup>.

As the Superintendent of Botanical Gardens at Dapuri, additional responsibilities were added to the Conservator's post. The Conservator was expected to plant and maintain roadside trees. In 1849-50, Gibson planted Neem trees on the road side from Akoordee to Dapuri<sup>31</sup>. Similarly, trees were planted on the road side in Satara and between the Nerul station and foot of the ghats of Matheran<sup>32</sup>. The Bombay Government sanctioned one thousand rupees to conserve these plants<sup>33</sup>.

## Conclusion

The Forest Department under Alexander Gibson had to play a dual role, to conserve the forests and at the same time ensure regular supply of timber to the government and maximize the revenues of the state. The delicate balance between these two objectives had to be maintained. Thus, plantation became an essential component of forest management. As the colonial state was reluctant to spend its revenues on forest management, plantations were carried out for commercial purpose, which could earn them revenues. Forests became more of a commercial commodity than a

matter of rich biodiversity to be protected from various unwanted factors although it helped in the better regeneration of a few specific timber such as teak. Such monoculture plantations altered the landscape and affected the biodiversity of Bombay Presidency<sup>34</sup>.

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Table - 1

Name of Villages	Total proceeds Rupees	Expense Rupees	Remainder Rupees	Khots share Rupees	Govt. share Rupees
Paleh	594	132	462	115	346
Beese	324	74	250	83	167
Reolee	104	22	82	27	54
Populghur	164	24	140	46	93
<b>Total</b>	<b>1,187</b>	<b>252</b>	<b>935</b>	<b>273</b>	<b>662</b>