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PROJECT REPORT

Science in the forest management in colonial Assam (1826–1947)

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Abstract
Since ancient period human beings have been dependent on forest and forest products, which gradually led to the evolvement of indigenous forest management system. The indigenous rulers and people revered the forest and forest products in form of sacred groves, trees and plants. Jhum or shifting cultivation is one such traditional method of cultivation which was favourable for the climate of Assam. Guha and Gadgil argued that in hilly and forestry land, where the plough could not penetrate, led to the adaptation of shifting cultivation in large expanses. For the first time the commercialization of forest products was started by the colonial administrators and for maximum production, science was introduced in the forest management. The application of science could be identified with forest plantation, silviculture, taungya and regulation on forest fires, grazing, wild animals, climbers, insects, parasitic plants and so on. The training programme for British foresters was also introduced. Under the taungya system indigenous people were allowed to cultivate along with the plantation. It firstly, allowed the colonial government to earn revenue and secondly, avoid any rift with the indigenous people. The forest legislations were used as an instrument for the maximum use of forest products by the Colonial Government and to debar the indigenous people's rights over the access of forest and forest produces. However, the experiments by the colonial ruler led to the transformation of *jungle* (natural forest) into a more regulated modern forest. The brief report examines the development of scientific forest management practices in colonial Assam.

Keywords Forest · Indigenous science · Rights · Taungya · Silviculture

1 Introduction

The British conquest of India brought about the plunder of natural resources and forest was the main source of exploitation. The British brought the science as their imperial partner in forest conservation (Saikia, 2011). This led to the inclusion of technology and intricate scientific experiments in the forest management which was alien to the customary knowledge. The application of science could be identified with forest plantation, silviculture, taungya and regulation on forest fires, grazing, wild animals, climbers, insects, parasitic plants and so on.

Implementation of science and conservation of forest in the hands of British led to the division of forest into reserve and protected forest. These contributed to the introduction of the idea of so called 'scientific forestry/conservancy' of forest and wildlife. Colonial forest rules led to a rift between local inhabitants and the state as the formation of reserve forest formally excluded the former from their traditional rights over forest. It was more an attempt to brought forest land under the British administration so as to maximize the exploitation of forest produce which led to the formation of forest department and enactment of forest acts in 1865. This project has tried to reveal the introduction of science in the forest management of colonial Assam and also the role of indigenous knowledge system in the protection of forest. An attempt has also been made to discuss the British policies and legislations towards forest management. The main objectives of the project are to study: (i) the science in the indigenous forest management system in Assam (ii) the introduction of science in the modern forest management by the colonial administrator (3) the attempts of the British government towards the protection of forest from fire, climbers, insects, parasites and wildlife (iv) the legalizations

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and nationalization of the forest management by the colonial ruler which helped in the introduction of the scientific forestry.

The study was carried out into six chapters (i) introduction (ii) indigenous forest management system (iii) forest management through silviculture system, both natural and artificial plantation and taungya cultivation (iv) protection of forest from fire, grazing, wild animals, climbers, insects and parasitic plants (v) the colonization of forest through the British forest policy and legislations and (vi) conclusion summarizing the findings of the project.

2 Living with the forest

The second chapter of project "living with the forest" attempts to understand the indigenous forest management system through the traditional ecological knowledge and cultural practices of various tribes and non-tribes of the colonial Assam such as forest grove, sacred tree and shifting cultivation as primitive practice. The history of shifting cultivation can be traced back to around 8000 BCE in the Neolithic period, which witnessed a remarkable and revolutionary shifting of humankind's mode of food production (Pant et al., 2018, p. 1). In the hilly region of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura, shifting cultivation, locally known as 'jhum', continues to be dominant mode of food production and the economic mainstay of many households (Pant et al., 2018, p. 1). The shifting cultivation was a way of life for the tribal people, closely related to their economic, social and cultural sphere. British administrator such as P.D. Stracey, Indian forest service officer, listed a number of problems caused by shifting cultivation. According to him, this primitive form of agriculture resulted in serious environmental problem, such as, loss of forest cover, erosion of topsoil, desertification and decline in productivity (Stracey, 1967). However, many study considered that the shifting cultivation does not harm the environment. Guha and Gadgil argued that in hilly and forestry land, where the plough could not penetrate, shifting cultivation in large expanses can easily be adapted (Guha & Gadgil, 2013). They also argued that traditional shifting cultivation may not be as destructive as the exploitation modern forest for timber. Even, Fredrick Beadan Bryant, Inspector-General of Forests, tended to view shifting cultivation favourably that was well suited to the local condition in moist forest and hilly tracts (Saikia, 2011, p. 205). Thus, the traditional shifting cultivation has been more suitable to the climate of Assam. Various ethnic group of Colonial Assam used to preserve and protect several forest patches and various trees according to their traditional belief and respect towards nature. Beels, Jalahs in Assam have played an important role in maintaining the ecology of the province as they performed functions like tramping of soil, maintaining nutrients and regulating water flows (Goswami, 2007, p. 252). Sacred groves and tress have been an important part of indigenous forest management. A Total of 26,326 ha land in Meghalaya is covered by sacred groves (Tiwari et al., 1998). The sacred groves in Meghalaya are known as Law Lyngdoh, Law Niam and Law Kyntang (Tiwari et al., 1999). Various tribes of Assam, such as Bodos and Rabhas who live in the plains and foothills in western part of this state have the tradition of maintaining some species of trees like as Giant bamboo, Pear bamboo, Pink banana, Indian Smilax, Areca nut, Sand paper tree, Devils cotton etc. Thus, the indigenous forest management system in colonial Assam was centered round sacred groves, trees, plants and the shifting cultivation helped the region to manage the forest for centuries.

3 Experimenting in forest

The third chapter of the projects deals with the experiments in forest by the British Government for the infusion of science and technology to have the maximum use and exploitation of forest resources. Though the colonial foresters heavily relied on western scientific knowledge for implementing effective forest management in India, it has been observed that British foresters also learnt from local experiences of various regions of India. The application of science became identical with varieties of experiments such as implementation of silviculture and protection of forest from fire, wildlife, insects and climbers. This chapter focuses on the plantation system, British attitude towards the shifting cultivation and taungya. The resolution on the Report of Forest Administration in the Province of Assam for the year 1925–26, emphasized the necessity to employ a special officer as silviculturist.[1] Under the silviculture, regeneration and afforestation was done mainly of two types, one was natural re-growth and other was artificial. The silviculturist took up the question of the natural regeneration of the trees like Bonsu, Hollong, Sopas, Makhai etc. in various district of Assam and experiments were carried out.[2] Plantation programme was done under artificial regeneration which included the plantation project of tea, teak, rubber, sal, bamboo etc. The plantation projects resulted in a methodological investigation of soil, climate and plant variety suited for the region. For the better forest management, various techniques such as use of wider spacing, strong seedling plants etc., were adopted by the foresters for fostering the plantation.

[1] Assam State Archive, *Resolution on the report on forest administration in the province of Assam for the year 1925–26,* order by the Governor, Government of Assam, 1926. p. 1.

[2] Assam State Archive, *Progress report of forest administration in the province of Assam for the year 1930–31*, 1931, p. 6.

Tending, pruning, thinning and felling were other methods adopted under the plantation systems. The adaptation of all these methods resulted in most regulated forest. As far the shifting cultivation is concerned there was confusion among the British administrators. The forest officials were of the view that shifting cultivation was the principal cause of forest destruction, landslide, silting up and drying up springs and rivers and causing floods etc. and so it should be banned, while revenue officers favoured the shifting cultivation for obvious reason of collecting more revenue. They were also of the view that the cultivators should not suffer. As a result of the confusion between forestry and agriculture, a new system emerged in which both would continue without harming the forest wealth and that was taungya system. Under this system the cultivators were encouraged for clearing the forests and replace the cleared tracts with more or less uniform forest crops in the taungya fields. Because of taugnya cultivation British government could earn revenue as well as more timber for fulfilling the need of railways, shipping etc.

4 Protection of forest

The fourth chapter of the project examines how the British government dealt scientifically with the question of forest protection in colonial Assam. The forests of India were a major source of revenue for the British. The forest products were materialized to meet various needs of the British administration which initiated forest conservation. Fires, grazing, wild animals, climbers, insects and parasitic plants mostly affected forests in colonial Assam. Fire was the most destructive of all these causes. According to forest administrative records of Assam, thousands acres of forest land were devastated each year by fire. Massive fires had the ability to destroy a large number of wild animals as well. Various steps were adopted by the British administrators for regulating forest fires. The rules and laws were made to make the forest men more responsible towards his duty of protecting the forest from any such events. Rewards were also offered to those who saved the forest from getting or spreading of the fire. The fire watchers and forest gourds were appointed to have a watch over it.[3] Grazing was another contributing factor in damaging the forest. It used to damage the woods in various ways like animals nibbling on small seedlings, biting-off buds, leaves and shoots; breaking-off coppice-shoots and gnawing the bark of trees; trampling on, bending down and breaking young growth; exposing and destroying roots etc. Therefore, grazing was regulated. For modern forests, wild animals posed a serious challenge. The wild elephants were a real threat to the young rubber tree.[4] Another threat to forest in colonial Assam was climbers. The climber such as *Spatholobus Roxburghii* in Assam causes boles in Sal trees to become distorted like a screw which requires repeated cutting to prevent such damage.[5] So, climber-cutting was practiced on a regular basis in almost every division of Assam. The insects and parasitic plants also attacked trees to obtain food. The manner in which the British Forest Department handled these issues is a highly contentious subject as their forest protection policies were mostly motivated by their own economic interests. There was a total negligence towards the wellbeing of aboriginal peoples. But we cannot deny the fact that adaptation of various scientific steps, mainly the silviculture technology was an important part for the overall protection of the forest.

5 Institutionalization of forest

The fifth chapter, deals with the formation of the Forest Department, training of colonial foresters, division of forest, working plan, demarcation of forest and forest legislations which ultimately led to the nationalization of the forest and bringing it under the control of British Government. The British government started collecting forest resources from the very beginning. The expansion of railways in India and the Industrial Revolution in England led to the maximum use of forest resources by the British. In the same way, due to the war, teak wood was procured from India for shipbuilding for British navy. Realizing the importance of teak wood, its conservation began soon after. In this way, the conservation of forest resources in India began and efforts were made to continue the supply of important timbers by planting. With this in mind, the Royal Forest Department was established in India in 1864. However, while working in the forest department, there were some problems. Since long, the local people were using the forest in various ways and they were able to take their essentials without any hindrance. But, the British authorities were always of the fear that all their efforts in scientific management of the forest might fail due to the interference of indigenous peoples. The cheapest way to get rid of this problem was to legislate and transfer all power to the Forest Department, thus creating a gap between the forest and the indigenous people. In order to achieve this goal, forest laws were introduced which restricted the rights of indigenous peoples and gave more rights to the Forest Department over forest. After the formation of the

[3] Assam State Archive, *Progress report of forest administration in Assam, for the year 1877–78,* Shillong, 1878, pp.14–17.

[4] Assam State Archive, *Progress report of forest administration in Assam for the year 1885–86*, Shillong, 1886, p. 14.

[5] Assam State Archive, *Progress report of forest administration in Assam for the year 1888–89*, Shillong, Printed at the Assam Secretariat Press, 1889, p. 11.

department, the British administrators realized the need of trained foresters and training of the British foresters was introduced as a part of experiment in the scientific forestry. Dr. Brandis was appointed as Inspector General of forests in 1863, and in 1867 his scheme for training forest officers for India in the School of France and Germany was introduced. Forest was divided into a few categories according to its use by the administrator. A working plan in forestry was needed for proper management because any timber could take many decades to mature, and harvestings had to be arranged in stages at long intervals and distributed throughout so that production was not only maximum but also well-sustained. The same way forest demarcation which means "the act of setting out or marking the limits or boundaries of a forest." was also an important part of the forest management. Although demarcation was not a silvicultural operation in and of itself, it was needed to allow the forester to work in forests systematically, without the danger of encroachment or trespass. The Forest Department catered to the economic interests of the government by issuing regulations from time to time. In this way, the consolidation of the British Empire in the forest areas became much stronger, as the legislation made it possible to protect the interest of one party only. Thus, as the forest laws were a part of scientific forest management, so scientific management was an important part of strengthening the British Empire. With the help of forest legislations, it was easy for the British government to implement scientific management system which favoured the economic exploitation of forest by the British government. The Assam Forest Regulation was passed in 1891[6] which was an instrument in the hands of the British for the exploitation of forest resources.

6 Conclusion

Thus, it can be concluded that the forest management system in colonial Assam was the outcome of various experiments executed by the colonial foresters and administrators. Initially, colonial forester experimented with the single plantation of more commercialized trees/plants but gradually they realized the problems with it such as increased insects' attacks, and adopted mixed planation, which had been existed since long back in form of *jungle*. The forest management in the pre-colonial Assam was result of indigenous knowledge system in forms of sacred groves, trees and plants etc. Even the practice of jhum/shifting cultivation was supposed to be favourable for the climate and land of Assam. During the colonial period scientific management of forest was introduced for economic benefits and commercialization of forest products and whatever experiments were done by the British officials they were only to increase the production of commercial products such as teak, pine, rubber, sal, etc. Colonial legislations were used as an instrument in the hands of the British officials to play their monopoly over the forest and to debar the indigenous people from their traditional right over the access of forest and forest produce. However, the forest legislations and experiments in the forest resulted in the introduction of silviculture, science of forest management and training of the forest officials in the forestry. One of the main advantages of the colonial forest management was the demarcation of the forest areas which brought its encroachment by growing population under the legal framework and thus restricted the interference in the forest areas. Finally, it can be concluded that the *jungle* was transformed into modern forest by the British in which the administration of the forest was made a state concern but the forest management such as of tree or cultivable produce was an outcome of both colonial and indigenous management system.

Data availability Data sharing not applicable.

References

Arupjyoti, S. (2011). *Forests and ecological history of Assam, 1826–2000*. Oxford University Press.

ASA, (1895). Progress Report of Forest Administration in Assam for the year 1894–95, Shillong, p. 19.

Goswami, S. (2007). Traditional ecological knowledge of North-East India. *The Journal of the Assam Research Society*, xxxix (1) &@, (2004–2006). Kamrupa Anusandhan Samiti, Guwahati.

Guha, R., & Gadgil, M. (2013). *This fissured land: An ecological history of India*. Oxford India Perennials.

Pant, R. M., Tiwari, B. K., & Choudhury, D. (2018). *Report of working group III shifting cultivation: Towards a transformational approach, contributing to sustainable development in Indian Himalayan region*. NITI Aayog.

Stracey, P. D. (1967). A note on Nagaland. *Journal of the Bombay Natural History Society, 64*, 440–446.

Tiwari, U. K., Bank, S. K., & Tripathi, R. (1998). Sacred groves of Meghalaya. In P. S. Ramkrishna, K. G. Saxena, & U. M. Chandrashekara (Eds.), *Conserving the sacred for biodiversity management* (pp. 253–262). Oxford and IBH Publishing Co.

Tiwari, B. K., Barik, S. K., & Tripathi, R. S. (1999). *Sacred forests of Meghalaya: Biological and cultural diversity*. Regional Centre, National Afforestation and Eco-Development Board, North Eastern Hill University.

[6] Assam State Archive, *Progress report of forest administration in Assam for the year 1894–95*, Shillong, p. 19.