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Origin and Development of Forest Study in Ancient India: An Environmental Approach

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Introduction

The long period of history when human beings were exclusively gatherers began to come to a close with the plant and animal worlds which helped them to acquire the art of domestication of plants and animals by degrees.

The Neolithic people had acquired better technological knowledge which helped them to cut down the big trees and open the forests by clearing off jungles. Childe argued that once sharp Neolithic tools were made, it became easier to cultivate the soil[1]. Other developments took place consequently with the development of agriculture and spread of cultivation. The agricultural pastoral people spread over the Indian subcontinent in many phases and the systematic destruction of forests in India started with the extension of Neolithic settlements. But the introduction of iron implements opened a new chapter in the extension of agricultural process. It is not certain whether the Rig Vedic Aryans had the knowledge of iron as because the meaning of the word *ayas* used in several contexts in the *Rigveda* is not conclusively determined. *Ayas* could have meant copper, copper-bronze or may have been a generic term for metals[2]. It may be logically assumed that the Iron Age started approximately from 1000 B.C. The Vedic people with their knowledge of iron and improved technical know-how started a steady eastward advance as far as the Gangetic Valley. With metal tools they could readily penetrate into the moist forests such as those of the Gangetic plains or the west coast. It seems that the newcomers were at first confined to the land of the Seven Rivers and before the end of the Rig Vedic period they had spread over a vast expanse of the territory of the subcontinent[3].

The advent of the people who prefered to describe themselves as *arya* practically had far reaching effect on natural vegetation of the country. The word *arya* is a linguistic term and the people may better be called Indo-Aryans. In eastward expansion of early vedic people the lead was taken by two tribes – the *Bharatas* and the *Videghas*. The *Bharatas* reached the bank of the *Yamuna* and the *Videghas* advanced upto to the river *Sadanira* (*Gandak*)[4]. In this context the story of *Videgha Mathaba* referred to in the *Satapatha Brahmana* requires mention. *Mathaba* a *Brahman* is said to have started from the bank of the *Sarasvati* river with sacred fire in hand and reached *Sadanira* (a river always full of water) in the country of *Videha. Videha* has been identified at present with Mithila and its adjacent areas in Bihar. This episode reminds us of the primitive tribal practice of slash and burn for acquiring agricultural land[5].

Thus with the eastward march of the Vedic people, a significant portion of land began to be converted into grassland or crop field replacing the forest, jungles, marshes and

other wasteland tracts. Along with many natural causes like volcanic eruption of high degree, flood, forest fire, the use of tools of stone, metalic axes and also practice of burning the jungles accelerated the process of deforestation. The burning of *Khandava* forest as depicted in the *Mahabharata* clearly illustrates the destruction of forests by fire[6]. Agricultural activities increasingly imposed pressure on the vegetal world. Not only that, greater use of forest produce like fuel, fodder, manure, timber elephants and other wild animals for military purposes became indispensable part of human life and settlement. Here in this paper an attempt will be made to trace the origin of the forest study in India from the days of the *Rigveda* upto the rule of the *Mauryas* and to find out the environmental concern as refelected in the provisions laid down by the government.

For convenience of understanding the paper is divided into three sections — (I) introduciton, (II) empirical study by the Vedic people, and (III) development of knowledge in the area as reflected in the Arthashastra and in the Asokan edicts.

Section – I

Some scholars exploring environmental history, like to think that there was hardly any dichotomy in the history of agrarian expansion and the environmental history of colonial and post colonial India[7]. But I would like to reiterate the view of Thapar that 'dichotomy between Vana and grama evolved in early times when the village consisted the settlement'[8] She explains that although the duality had existed for many centuries, the perceptions accompanying it were neither static nor uniform. The forest was seen in multiple ways, and historical change altered the focus[9]. The historians of early India though did not produce a specific historiography of environmental history yet they certainly addressed the issues like historical geography, state formation, extension of agriculture, use of iron, impact of state and society on forests and forest people and many other which in fact helped in a way to develop an environmental approach to the study of ancient Indian history.

The Aryans were partly pastoral and partly agricultural people. With the march of agriculture a significant proportion of land began to be converted into grassland or crop fields which replaced forests, marshes and other non-agricultural land. We find distinct classification of land into different regions according to the nature of the soil and climate as late as the time of Charaka[10].

In such a study it is logical to examine the issue in long term perspective. The relationship between man and nature and man's role whether prudent or profligate may be judged by taking into consideration the dominant mode of resource use by the man within the broader economic frame of the time he is living. In this sense, the people of the Rigvedic or the later Vedic period though largely depended on forest resources, could do little harm to nature compared to the years of industrial development of present time.

The Indo-Aryans as are commonly called migrated to India and they had to clear up extensive forest tracts for the purpose of habitation and agricultural as well as pastoral purpose. For a network of connecting paths between different village settlements, more trees were to be felled down. Everyday necessities like building of huts, carts, chariots etc. could be meted out by increasing supply of forest woods, and "there was nothing unusual in

what done by the Aryans, for, a migrant community in a forest-country, would have to deplete its forest wealth for fresh fields and pastures anew"[11].

Agriculture has been playing a vital role in the economy of India ever since the dawn of history and that agriculture came to be considered as an important vocation by the Vedic people is evident in the Vedic hymns. For example a verse may be cited from the *Rigveda*, Book X. Verse 13 in chapter 34 which bears a divine message from the Sun God who directs the mankind to take to agriculture. Book X of the *Rigveda* though is considered as later interpolation, yet the verse may be quoted for our better understanding. The Verse is — play not with Dice: no, cultivate thy corn-land. Enjoy the gain, and deem that wealth sufficient. There are thy cattle, there thy wife, O gambler. So this good Savitar himself hath told me (RV., X. 34, 13. p555)[12]. Thus the *Rigveda* reflects the actual esteem of the people for the vocation of agriculture. But side by side with developing a agriculture based economy, the Rigvedic people started careful observation of the flora and fauna of the newly acquired country. They began to study carefully its flora and fauna with a view to proper exploitation of the resources. The Vedic literature gives us a clue to the understanding of the perception of the Indo-Aryans about the forests. Thus the relationship of the forest to the settlement i.e. Vana to the kshetra ushered in a new area of study i.e. study of plants, trees, herbs and others.

The Vedic people before being merged into the vast mass of the Indian population among which the Aryan and non-Aryan elements are not clearly distinguishable, left for the posterity nothing spectacular from the strict point of view of material culture. Nevertheless it can never be over looked that they created something most amazing in world history — a vast literature of over a thousand songs and hymns which is compiled as the *Rigveda Samhita*. It is obvious that such a composition primarily evokes appreciation of the historians of literature but at the same time, it can not be ignored as it contains certain concepts with exceedingly interesting science potential. Even a Marxist critique like D.P. Chattopadhyay agrees to the view[13].

Plant bearing fruits or flowers as well as the medicinal herbs originally remained mixed up in forest jungles. The people had no other option but to bring them out of wilderness and to sort them out by a process of trial and error and replant them in village settlements or their boundaries to meet out the human needs. To the Aryans, the study of plants and plant life of the newly acquired country became a self imposed task. Different herbs trees and plants are classified, named and praised for their medicinal value in the *Atharvaveda*. In the *Rigveda* we get hymn, which is described by G.P. Majumdar as the first medical utterance of man.'[14] A faint glimpse of scientific idea of fight between herbal antidote and the germ within the body of a diseased man may be had from a verse of the *Atharvaveda*. *Yaksma* being treambled at the sight of the medicinal herb is nicely described in the following hymn:

'As at the roaring of a lion do they quake: as at fire do they tremble a [the herbs when] brought, let the *Yaksma* of kine, of men, go driven by the plants beyond navigable streams (*AV*. VIII.7.15 p.500).[15] Thus a deeper insight into the hymns of the Vedas often suggests a formative stage of empirical knowledge system largely developed on the basis of

familiarity with and observation of the common people on the plant world. The people belonging to both the indigenous and newcomer groups held their share in this development.

We can draw the attention of the reader to an unique example to substantiate the proposition that the indigenous forest people had parallel contributions to the accrual of knowledge in forest study which bear much historical significance.

In the *Atharvaveda* we have an interesting reference to a *Kirata* girl who digs for a herbal remedy on the ridges of mountains[16]. So it may not be merely a vague conjecture if we say that the forest study and its out come as a whole was not the credit of any single people's group. It was the product of the efforts made both by Aryan outsiders and the original inhabitants of the country. Besides, it should be mentioned that side by side with the idealistic and mystic elements inherent in the Vedic corpus, there are essential material information in the *Vedas,* which can not be satisfactorily interpreted by stigmatizing it only as otherworldly or metaphysical[17]. This view possibly is shared by Thapar when she says 'that binary separation of the rational from the irrational, astronomy from astrology, for instance, is necessary to the analysis of scientific knowledge; the irrational cannot be outright dismissed or ignored. It too has to be assessed perhaps as an alternative or a system within itself confronting the rational"[18]. In fact agriculture is a system of life where men, animals and plants are intimately related. Not only plants or man, the *Rigveda* is replete with references to number of beasts and birds. That the Indians knew the use of horse, cattle and elephant is attested by the *Rigveda.* Biological phenomena, it is true, are not separately treated in the Vedic literature, but information regarding the animals are diffused in a distinct way. There are mentions of vigorous horse (RV., i.28.7.p17), mighty elephant (RV., I.64.7.p.43) or even of watch full eyes of bird (RV., X 68. I. p. 581). We get so many verses from which we may form an idea about the curiosity and interrogative mind of the ancient people about the behaviour, strength and appearance of different animals both tamed and untamed.

Section – II

A significant development occurred with the birth of Imperialism in northern India in 6th century B.C. The eight centuries from 500 B.C. to 300 A.D. followed the colonization of the vast expanse of the Gangetic Valley; a remarkable feature of the age was that the rulers of northern India became conscious of the necessity of imposing control over the revenue earning natural resources. Forests as natural resource base automatically attracted the attention of the state authority and from that time onwards attempts were made to bring the forests under the regulatory management of the state. We have least of information regarding the management of forests until we come to the days of *Kautilya.*

The most detailed and perceptive provisions for forest management are found in the *Arthashastra* of *Kautilya.* The ruler was not only to protect produce forests and elephant forests but also to set up new ones[19]. We notice mention of some principles for categorization and maintenance of forests. The reason may lie also in the fact that as the empires rose, war became inevitable and the war machines were being perfected. Elephants as well as hard timber were the important component of defence. *Kautilya* pointed out clearly the urgency of proper maintenance of elephant troops for defence of the country[20]. He thought

that 'the victory of kings (in battles) depends mainly upon elephants, for elephants being of large bodily frame, are capable not only to destroy the arrayed army of an enemy, his fortifications and encampments, but also to undertake works that are dangerous to life (*KA.* II.2.13-14). Qualitative classification among the elephants from different regions of the subcontinent, discerned in the *Arthashastra* indicates a serious attitude of the author to determine the policy to be adopted by the state in time of collection of this war-machine. According to *Kautilya* 'Elephants bred in countries, such as *Kalinga*, *Anga*, *Karusa* and the East are the best; those of the *Dasarna* and western countries are of middle quality; and those of *Saurashtra* and *Panchajana* countries are of low quality'[21].

If we go by *Kautilya,* it is evident that there were three categories of forests in the Maurya Empire:[22] (a) Forests donated to *brahmanas* for religious learning and cultivation of *soma* plants (II. p48). (b) Reserve forests with plantation of fruit trees, bushes, bowers, thornless trees, lakes and animals for king's merry making and hunting expedition. The wild animals were to be shorn of their teeth and claws for safety of the royal people during hunting. The reserve forests were to be guarded with ditch and provided with single entrance. (II. p. 48). (c) The third type of forests were game forests and remained open to public. This type of forests was situated on the extreme limit of the country. *Kautilya* advised that in addition to the public forests, forests were to be formed exclusively for elephants.

In such a discourse on forest a few words may be said with regard to the notion of forest divisions in ancient India. The ancient people used to think in terms of eight Forest Divisions in India[23]. These eight forest divisions were gaja Vana i.e. these were dense forests. The eight forest divisions were as follows: (1) *Prachyavana*, (2) *Karusha Vana*, (3) *Dasarnaka Vana,* (4) *Vamana Vana*, (5) *Kalesha Vana* (6) *Aparantaka Vana,* (7) *Saurashtravana,* (8) *Panchanada Vana.*

D.C. Sircar opined that the concept of the eight dig-gajas probably had influenced the ancient Indian writers' classification of the Indian elephants under eight typical groups[23]. *Kautilya's* qualitative categorization of elephants according to their provenance may help us to conceptualize the ancient eight divisions of forests in India. The idea of eight forest division had been prevalent for long time at least as late as the time of *Manasollasa*, the encyclopaedic work of *Chalukya* king *Somesvara* III (1126-1138) A.D. The names found in the *Arthasastra* are mentioned by *Somesvara* with slight changes.

It is said [24].

Kalingam ve (ce) di Karusam Dasarnam cha vanam varama|
Angireyam tatha prachyam madhyaman vanam = isyate ||
Aparantam panchanadam Saurastram cha adhaman vanam|
evam estau vananyahur gajanam janmauah padam||

The list of the forest division as mentioned above occurs in the *Visnudharmottara Purana.* What ever similarity lies with regard to the nomenclature of the forest divisions in the three texts of early India with few centuries gap in between, it is not easy to identify the geographical location of the forests with accuracy. At the same time it may be pointed out that all the forest divisions did not belong under the command of a single ruler of all India

stature, not to speak of extreme south. So the uniform pattern of forest administration might not have developed through the length and breadth of the country. But a specific department to deal with the forests, forest produce and protection and conservation of forests is found in the *Arthasastra* and that *Kautilyan* system perhaps exercised a dominant influence in determining the government policy in later period too.

From the functions and responsibilities assigned to superintendents of different departments, it may be assumed that the heads of various departments had to run their administrative works keeping themselves in touch with each other's department. Well-knit centralized method of work made the government conscious of its own resources.

According to *Kautilya*'s administrative definition, 'Enclosures for beasts, deer parks, forests for produce and elephant forests were the constituent elements of forests (A.S. II. 6.6)'[25].

The department of forest produce as it was called in the days of the Mauryas was administered by the Director of forest produce i.e. *Kupyadhyaksha*. The duties of the *Adhyaksha* of the Forest Department as specified by *Kautilya* were as the following (A.S. II. XVII. 1-17).

(1) The Director of Forest produce shall collect timber and other products of forests by guards of the produce forest. (2) He should start factories for forest produce. (3) he should fix fines and compensations for damaging the productive forests. (4) He should classify the group of forest produce. Hard timber giving trees were *saka, tinisa, dhanabana, arjuna, madhuka, tilaka, sala, simsapa, arimeda, rajadana, sirisa, khadira, sarala, tala, sarja, asvakarma, somavalka, kusa, amra, priyaka, dhava* and others. (5) He should classify the different types of bamboos and group of other reeds, namely *utaja, cimiya, capa, venu, vamsa, kantaka, bhalluka* etc. (6) He should classify different types of canes and creepers like *betra, sikavalli, vasi, syamalata, nagalata* etc. (7) he should know all fibrous plants like *malati, murva, arka, sana, gavedhuka* and other creepers. (8) All writing materials like *tala, tali* and *bhurja* were also to be identified. (9) He should identify all kinds of flowering plants, medicinal herbs, and poisonous plants. He should collect all kinds of poisons, and preserve the venom of snakes and insects in pots for selling. (10) He should collect the skin, bone and bile etc. of the dead animal.

The defence of the country largely depended upon the various products of forests. The logs of hard woods were stored in the government godowns and used for setting up palisades around the cities[26]. Extensive excavations have unearthed the wooden palisade which sorround the city of *Pataliputra* which is corroborated by Megasthenes' *Indica.* Timber and several wooden planks were discovered by Kumrahar excavation at Kumrahar and Bulandibag.[27]

The superintendent of the elephant forests was a separate administrative authority. A large number of employees like *banapalas*, elephant keepers, foot chainers, physicians, trainers and group of attendants served under him. They had to maintain a record of each and every elephant in writing. We observe the mention of a series of environment friendly conservation measures in the *Arthasastra.*

For the purpose of protecting the forest and wildlife, the following laws were to be followed:

1. In the extreme limit of the country, elephant forest separated from wild tracts were to be formed.
2. The superintendent of the elephant forests with his guards shall not only maintain the upkeep of the forests but also acquaint himself with all passages for entrance and exit.
3. Whoever kills an elephant shall be put to death.
4. Whoever brings in the pair of tusks of an elephant, dead due to natural causes, shall receive a reward. (II. 2. 6 – 10).
5. Trespassers upon a forest preserve would be severely punished. The Supervisor of slaughter house should impose the highest fine (for violence for binding, killing or injuring deer, beasts, birds or fish for whom safety has been proclaimed and who are kept in reserved parks (II. 26.1).
6. None should do any harm to the productive forests. If any one doing so, would be penalized (II.17.3).
7. He shall cause to be burnt in fire one who sets on fire a pasture, a field, a threshing ground, a house, a produce-forest or an elephant forest (IV. 11.20).

The laws mentioned above probably were in force during the reign of the First Maurya ruler. In the reign of Asoka, the scope of the forest and game law was further widened. In the pillar Edict V, Ashoka clearly forbids that no one should set fire to the forests without any purpose, or with cruel motive[28]. In the major Roct Edict I. we find the royal proclamation for checking the killing of huge number of peacocks and deer in the royal kitchen[29]. The Major rock edict VIII tells us that Asoka totally abolished royal hunt in the 10th regnal year of his reign.

The prohibition relating to animal killing in forests on specified days of the lunar year was imposed in the 26th year of his reign[30]. All hunters, slaughterers and fishermen were strictly ordered to obey the royal injunction. The Asokan edicts impose restrain on killing of animals and advocat for planting and protection of trees. One such edict e.g. the Major rock edict II is an outstanding evidence of environmental concern of the Maurya king. The edict runs as follows — 'The king with charming appearance, the beloved of the Gods in his conquered territories and in the neighbouring countries, thus enjoins that medical assistance should be made available to both men and animal; the medicinal herbs, the fruit trees, the roots and tubers are to be transplanted in those places where they are not presently available, after being collected from those places where they usually grow; well should be dug, and shadowy trees should be planted by the road side for enjoyment both by men and animals'[31].

From time immemorial forests have been fighting a losing battle as men have to encroach the natural vegetation for his own existence. But the mode of resource use in a given economy is the determinant factor as to fix the degree of his predacious role. Prudence vis-à-vis profligacy in resource use mark the entire course of human history. The study of

flora and fauna in natural vegetation and forested territory consequently became a part and parcel of the function of a state. State sponsored conservation activities and forest protection measures obviously were the outcome of long drawn empirical experience of the human society. India was no exception.

References

1. Habib Irfan , *People's History of India; 1 Prehistory*, Aligarh Historians Society Tulika, New Delhi, 2001, p. 48.
2. Singh, U. , *A History Ancient and Early Medieval India,* Pearson Education. Delhi, 2009, p. 190.
3. Ray Chaudhuri , H.C. *Studies in Indian Antiquities*, University of Calcutta, 1989, p. 58.
4. *Ibid.*
5. Thapar, R. , *Past and Prejudice* (Bengali trans. by B.D. Chattopadhyay) National Book Trust, India, New Delhi, 1977, p. 57.
6. Kasiram Das Birachita *Mahabharata* (in Bengali), Saksharata Prakashan, Kolkata, 1976, pp. 127-128.
7. Sinha Kapur, N., (ed). . *Environmental History of Early India: A Reader*, Oxford University Press, New Delhi, 2001, p. XV.
8. Thapar, R. , 'Perceiving the Forest: Early India' in N. Sinha Kapur (ed.) *Environmental History of Early India*, Oxford University Press, New Delhi, 2011, pp. 142-160.
9. *Ibid.*
10. Majumdar, G.P. *Vanaspati: Plants and Plant Life as in Indian Treastises and Traditions*, Univesity of Calcutta, Kolkata, 1927, p.66
11. Chatterjee, C.D., 'Forestry in Ancient India' in *West Bengal Froests', Century Commemoration Volume,* Forest Directorate, Government of West Bengal, Calcutta, 1964, p.8.
12. Griffith, R.T.H., *The Hymns of the Rigveda*, Motilal Banarsidass Publishers Pvt. Ltd., Delhi, 1991, p.555.
13. Chattapadhya, D.P. , *History of Science and Technology in Ancient India. The Beginnings*, Firma KLM Pvt. Ltd. Calcutta, 1986, pp. 372-373.
14. Majumdar, G.P. , *Vanaspati: Plants and Plant Life as in Indian Treatises and Traditions*, Calcutta University, 1927, p. 151.
15. Whitney, W.D. *Atharvaveda Samhita,* Vols. I&II, Motilal Banarsidass Publishers Pvt. Ltd., Delhi, 1962, p.500.
16. Chatterjei, S.K., *Kirata Jana Kriti,* The Asiatic Society, Kolkata, (Reprint), 2007, p. 27.

17. Sarkar, B.K, *The Positive Background of Hindu Sociology*, Motilal Banarsidass, Delhi, Reprint, 1985, pp. 125-127.
18. Thapar, R., 'History of Science and the Oikoumene' in S. Irfan Habib and Dhruv Raina (ed.) *Situating the History of Science: Dialogues with Joseph Needham.* Oxford University Press, New Delhi, 2001, pp. 20-21.
19. Divan, S. and Rosencranz, A., *Environmental Law and Policy in India: Cases, Materials and Statutes*, Oxford University Press, New Delhi, 2001, pp. 23-24.
20. Shamasastry, R., (trans.), *Kautilya's Arthasastra*, Mysore Printing and Publishing House, Mysore, 1961, p. 49.
21. *Ibid.*
22. *Ibid.*
23. Sircar, D.C. 'The Elephant Forests of Ancient India' in D.C. Srcar (ed.,) *The Bhakti cult and Ancient Indian Geography*, C.U. Calcutta, p. 160. Ibid., 1970, p. 163.
24. *Ibid.*, p. 163.
25. Kangle, R.P. The *Kautiliya Arthasastra* Part II, University of Bombay, 1972, p. 76.
26. Waddell, L.A., *Discovery of the Exact Site of Asoka's Classic Capital at Patiliputra,* Calcutta, 1982, p.63.
27. *Kumrahar Report*, Archaeological Survey of India, 1915, p. 23.
28. Thapar, R., *Asoka and the Decline of the Mauryas*, Oxford University Press, Delhi, 1998, p. 264.
29. *Ibid.*, p. 250.
30. *Ibid.*, p. 264.
31. *Ibid.*, p. 251.