

4. PROTECTION OF FOREST IN ANCIENT INDIA

4.1. The Beginning of Deforestation

With the introduction of agriculture in the Neolithic period, man began to exercise considerable influence on the plant life in India as elsewhere. With the growing population and increasing demand on the forests for a clearance of land for cultivation, for smelting copper and later on iron, for baking bricks and pottery, a tremendous destructive influence in addition to climatic and edaphic changes, reduced the indigenous forests to a great extent. The flourishing vegetation in Rajasthan and Sind was replaced by a desert about a couple of thousand years ago¹. Excepting Rajasthan, no portion of India seems to have suffered from aridity or barrenness. Being situated within monsoon belt, almost all portions of this subcontinent could get sufficient rainfall which provided condition for the vigorous growth of forests.

The history of forests in India like any other country in the world is one of deforestation. There are many natural causes for the destruction of large tracts of forests. Mention may be made to volcanic action of great intensity, flood, fire and also to the meteoric showers².

But man's responsibility for the destruction of forests is the greatest. From the starting mark of human civilization, man had to depend on the supplies of nature. For pastoral and agricultural land he had to clear off the jungles and trees. He had to cut down the trees for constructing houses and for gathering fuels. With the passage of time he came to learn how to use plants, herbs and the roots of some trees as drugs for curing various diseases.

The agricultural pastoral people spread over the Indian subcontinent in many phases. With the settlement of the Chalcolithic people the systematic destruction of forest in India started. The Indus civilization extended over a vast area. In 1983 the Allchins give an approximate measurement of the area : " the area enclosed by a line joining the outer-most sites at which the material culture of this civilization has been discovered is little less than half a million square miles, considerably larger than modern Pakistan".³ Obviously, for such a settlement the Indus people had to wipe out forest tracts for acquiring land and bulding up the towns. The present climatic conditions in the Punjab and Sind are not suitable for the type of fauna that this tract supported in pre-historic times. The picture of wild life of pre-historic India built up from the archaeological remains indicates the presence of large stretches of thick forest areas on which thrived a large variety of wild animals including the tiger, the elephant, the rhinoceros and the buffalo.

4.1.1. Advent of the Aryans and Introduction of Iron

The knowledge of metal, especially the introduction of iron, opened a new chapter in the history deforestation in India. Possibly the R̥gvedic Aryans did not know the use of irons. The general term used for the metal is *ayas*. Probably the word '*ayas*' began to mean iron later. On the basis of the available archaeological evidences a view is coming to the fore that iron was introduced into India by about 1000-800 B. C.⁴ The discovery of iron which in many areas led to the colonisation of the forested land by agricultural people made easy the continued felling of big trees in forests. The Aryans with their knowledge and mastery of iron and improved technical know how started a steady process of deforestation towards the east as far as the Gangetic valley..

This is not certain, when the Aryans first came to north - west India or the land of seven rivers or ' Sapta Sindhas' as it is called in the Rgveda. But their occupation of the country must have taken place at least as early as 1400 B.C.⁵ It seems that the new comers at first fixed up their abode in the punjab but before the close of the Rgvedic period, they had spread over the vast expanse of Indian territory.

The Aryans were partly pastoral and partly agricultural people. Naturally they required land for pastoral as well as agricultural purposes. This land could be obtained only by clearing up the jungles. With the march of agriculture and village settlement, a significant portion of forested land began to be converted into grassland or crop fields. Fire, stone axes and metal axes aided in this process of conversion. The burning of the 'Khāndava' forest as depicted in the Mahābhārata Ādiparva beautifully illustrates the destruction of forests by fire.⁶ Cultivation imposed increasing demands on natural vegetation and a greater removal of forest produce to be used as fuel, fodder, manure, building-timber and implements. But in this connection it is noteworthy that the Aryans did not destruct forest for building towns and cities in the early phase of their civilization.

After the decline of the ' First urbanisation ' of Harappan culture, India had to pass through a long period of no remarkable building activity. Ghosh⁷ has very aptly made his observation. " For her next cities, her 'second urbanization" India had to wait for over a thousand years after the disappearance of the Indus cities - till the middle of the sixth century B. C., which saw simultaneously the beginnings of her historical period".

In fact, after the end of the first urbanisation, it took a period of about a thousand years or more for the reintroduction of urban settlement. This intervening period between the two urbanisations is often called by the archaeologists as the Dark Age.⁸

During this intervening period, the Aryans developed human civilisation in sylvan surroundings.

Their first settlement was flourished in the river banks and in the process of extension of their settlements the Aryans had to create open spaces inside the forests. As they avoided building construction, large scale destruction of trees was not needed alike in this period; still deforestation continued for laying out villages for human habitation. The Aryan people used chariot made of wood, they lived in thatched cottages for which wood was indispensable material. This is not all. For communication of villages with each other, suitable paths were to be made for passing their carts and chariots. For this purpose, clearing up of extensive forest tracts were carried on. With the extension of human settlement the depletion of forest continued for creating fresh fields and pastures anew.

So, we find that from the dawn of history human community has been surviving and thriving at the cost of forest wealth and this led to the depletion of vast tracts of forests throughout the ages.

4.2 Emergence of Different Professional Castes Based on Forest Products

From the paliwork Dhammapāda² we get the name of some professional castes of ancient India who depended entirely on the

forest products for their subsistence. These castes were 'Nalakāras (manufactures) of bastets and mattresses),' *Usukāras* (Manufactures of arrows) *CammaKāras* (leather workers), *Tacchakas* (carpenters), *Pāśikas* and *Niṣādas* (the trappers and the hunters), and the '*DantaKāras*' (ivory workers).

In the *Jātakas*,⁹ the collection of timber and fire wood, medicinal plants, and herbs and the profession of carpentry are mentioned. Carpentry depended on the timber-supply from forests (J.T. 25 and 81). The transport of cart-load of logs (JT. 116 and 139) suggests a heavy demand for wood both for house - building and fuel (J. T. , 288 snf 305). The items of furniture mentioned in the tales indicate heavy demand on wood. Stick gathering (JT. 8) faggot-bearing (JT. 9) and bird-snaring (JT. 236) were also forest-based occupations.

Another forest-based profession was wicker work. A considerable number of people were living on basket making with bamboos of forest belt. (JT. 222) and osiers of swampy area (JT 48 and 98).

The skins and hides of animals were used. Apart from skins of domestic animals, the tiger skin, panther hide and deer skin were used (JT. 28, 32 and 232).

So, from various references, there is hardly any scope to deny the fact that man's role in this endeavour is that of a predator.

Some vedic and pali works throw some light on the professions of the forest dwellers.

Among such tribes may be mentioned Goat clan, Fish-clan, Horse radish clan, the Serpent clan, Bird clan, Lambakarnas² etc.

In later days i.e., in the age of Kauṭilya.¹⁰ We get references to the forest people like Trappers, Śabarās, Pulindas, Caṇḍālas and other forest dwellers. These people were utilised as guards in the frontier region (KA. 11.1.6), During this period, these forest dwellers and the people who entirely depended on forest produces like yarn, bamboo, leather etc. and belonged to the lowest strata of the society were gradually being integrated functionally to the four-varna structure of the Aryan society. That these people were assigned with certain portion of land for quarter within the city area though beyond the stables of animals is evident from the *Arthāśāstra* (KA. 11. 4. 12). But still, the pāṣandas and the caṇḍālas were not allowed to reside even in these areas. Their quarters were fixed on the outskirts of the cremation ground (KA. 11.4.23)

However, there is not tint of doubt that the people who thrived entirely on the products of nature must have developed a cultural tradition and belief system of their own, favourable for conservation of nature.

4.3. Spirit of Enquiry

As because the plants and animals constituted the intimate associates of ancient people in India, a spirit of enquiry very likely grew among them as to the effect of trees and plants growing near their dwelling places. It is evident from the vedic works that the Aryans were careful observers of flora and fauna of this nearly acquired territory. In the vedic literature, we find a large numbers of terms

used for describing the different parts of plant body. To utilize the forest resources in best possible ways the Aryans classified not only the trees, keeping in view their general usefulness but also their medicinal properties. In the Ṛgveda,¹¹ the trees have been classified as *Phalini* (bearing fruits), *aphaṭā* (not bearing fruits), 'apuṣpā' (devoid of flowers) and *puṣpini* (having flowers). In the same Veda the plant kingdom has been divided into *Vṛkṣa* (tree), *gulma* (shrub), *bheṣaja* (medicine) and *laṭā* (creeper), *Oṣadhi* is also a vedic term for a class of tree (Ṛgv. x. 97.15).¹⁰

Manu's classification of plants is very clear (MS 1,46,47,48).¹² These are : *Oṣadhis*, *Vanaspatis*, *Vṛkṣas*, *Guccha*, *Gulams*, *Trṇas*, *Pratānsnas*, *Vallīś*.

Carakas¹³ classifications run thus : *Vanaspati vānaspatyas*, *oṣadhis*, *virudha* (sutrasthana1, 36, 37).

The scientific spirit of enquiry about the plant kingdom inspired the people to discover that plants and trees are animate beings. The height of knowledge on the life of plants acquired by the aryaans attained to such an extent that even there is indication in the hymns of the *Ṛgveda* that the vedic Indians had some knowledge of the manufacture of food, the action of light on the process and storage of energy in the body of the plants - a great achievement indeed for our ancestors at that remote age.¹⁴

In this connection, it is reasonable to believe that the Aryans might have acquired some knowledge regarding Indian plants from the aboriginal forest tribes. The totemistic clans of the Ganges valley who were forest dwellers should not be deprived of their credit for

contribution to the study of nature in that most ancient age. The tribes had adapted themselves culturally to their biological and physical environment having learned by trial and error what to eat and what to avoid, and how to make prudent use of natural resources. Such dwellers naturally, are expected to have developed a cultural tradition of their own. This traditional knowledge and culture enriched the main stream of study of nature subsequently.

The vedic Indians introduced four stages of life. The system of *vānaprastha* and *Sanyāsa* i.e. the third and fourth *āśramas* which were practised by the *Brāhmaṇas* undoubtedly helped them in acquiring knowledge of the Indian flora and fauna. In these two *āśramas* a *Brāhmaṇa* had to live in a cottage built within or near the forest. Some *Brāhmaṇa Kumāras* often resided in the hermitages for acquiring knowledge under the supervision of *Vedajñā Brāhmanas*. There could hardly be any better system for man to study the behaviour of nature in his surroundings. The forest provided them not only with a knowledge of material resources it provoked their imagination which culminated in the creation of a new series of vedic compositions, the *Āraṇyakas*.

4.4. Extent of Forests

Before going to the discussion about the management and administration for forest protection, some mentions should be made regarding the idea of extent of forest tracts in ancient India.

The Aryans had spread over a vast Indian territory before the close of Ṛgvedic period.⁵ In the east the Ṛgvedic Aryans certainly reached the holy waters of the Jamunā and the Ganges. We find the mention of the Gangā in the Ṛgveda (Xth Mandala, Nadīsūkta There

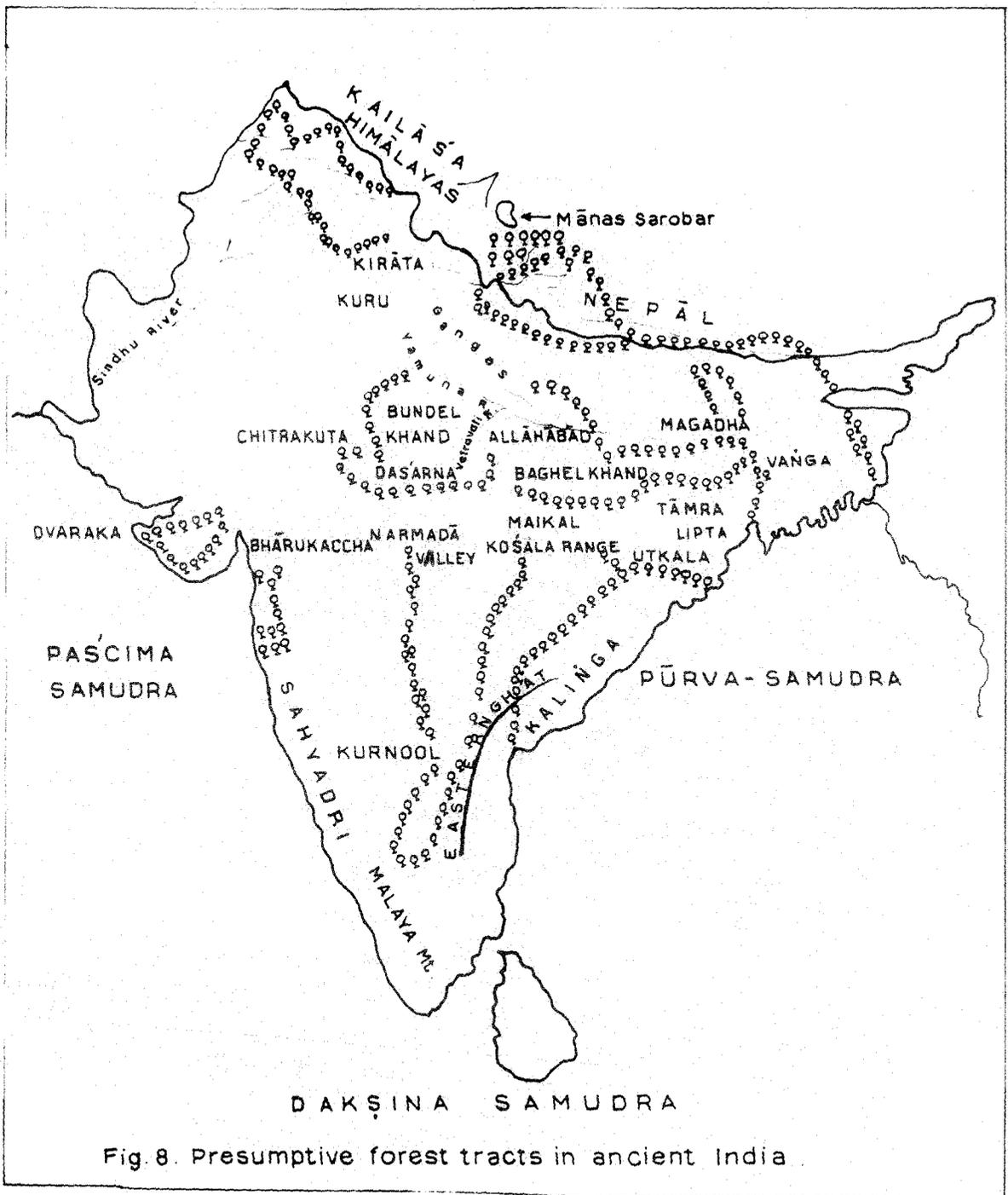


Fig. 8. Presumptive forest tracts in ancient India.

is some controversy about the xth Mandala that it was a later insertion). In the next period (1400-1200 B. C.) that of the *Yajus* and *Atharva Samhitas* and the earlier *Brāhmaṇas*, the geographical knowledge of the Aryans had extended as far as the *Gandak* (*Sadānīrā*) in the east and as far as the *Narmadā* (*Revottara*) in the South as indicated by the *Satapatha Brāhmaṇa*.⁵ The country situated in the east of *Sadānīrā* was probably the ancient *Mithila*.

In the age of the composition of *Āraṇyakas* and *Upaniṣads* (1200-700 B.C.), the eastern limit of the Aryan colonies seem to have extended further up to the rivers *Koshi* and the *Ganges*. In the later vedic literature, the names of the two rivers *Ganga* and *Jamunā* occurred several times. *Narmada* still continued to be the southern limit. Regarding the southern limit a much later evidence¹⁵ of the first century A.D. can not be ignored. In the *Periplus* we see the following description : "Beyond *Barygaza* the adjoining coast extends in a straight line from north to south; and so this region is called *Dachinabades*... the inland country back from the coast toward the east comprises many desert regions and great mountains, and all kinds of wild beasts leopards, tigers, elephants, enormous serpents, hyenas and baboons of many sorts..." The abundance of such wild beasts clearly prove the existence of dense forest tracts beyond the *Narmada* river covering a vast area This was probably the '*Apaṛāntaka-vana*' of the *Viṣṇudharmottara Purāṇa*¹⁶. But on the upper course of the *Godavari* there were certain flourishing settlements in *Pratisthana* from the time of the *Buddha* i.e. 6th century B.C. Up to this time the geographical knowledge of the Aryans was confined to the area mentioned above.

4.4.1. Forest Division

We get from the *Arthaśāstra*¹⁰ the names of eight forest divisions in ancient India in relation to the availability of different qualitative varieties of elephants. Kautilya speaks that the elephants from *Kaliṅga*, *Aṅga*, *Karūsa* and *Prācyā* countries constitute the best class; those of *Dasārṇa* and *Aparānta* are medium and those of *Surāstra* and *Pancañadas* are the worst (KA. 11. 2. 15. 16).

The number of *Dig-gajas* are also eight in different texts as is evident from *Amarakoṣa*¹⁷ as well as *Viṣṇudharmottara*.¹⁶ We also get a list of eight Forest Divisions (*gajānām-van-āstakam*) in the *Viṣṇudharmottara Purāṇa*¹⁶ (1.251). The ancient Indians probably used to think in terms of eight Forest Divisions and eight *Dig-gajas*. " The number of the *Dig-gajas* seems to have influenced the ancient Indian writers" to classify the Indian elephants into eight typical groups".¹⁸

The eight Forest Divisions (1. 251.22-37) of *Viṣṇudharmottara Purāṇa*¹⁸ were as follows :

1. *Prācyā-vana*, 2. *Karūśa-vana*, 3. *Dasārnaka-vana*,
4. *Vāmana-vana*, 5. *Kāleśa-vana*, 6. *Aparāntaka-vana*, 7. *Saurāstravana* and 8. *Pañcanada-vana*.

The *Viṣṇudharmottara* is regarded as a composition of 4th to 5th century A.D. But there is some controversy about the date of this text and some scholars like Hazra and Winternitz assign the date between 628 and 1000 A. D.¹⁸

In *Mānasollāsa*¹⁹ the encyclopaedic work by king Someśvara (1126-38 A.D.), the verses embody classification of elephants according to the sources of their availability (Man. 1.2.179-81). "*Kāliṅgam̐ vedi-kāruśam̐ Daśārnām̐ ca vanam̐ varam̐* |

Āṅgireyam̐ tathā prācyam̐ madhyamam̐ vanam̐=isyate ||

Aparāntam̐ pañcanadam̐ saurāstram̐ c-ādhamam̐ vanam̐ |

evam = aṣṭau vanāny = āhur = gajānām̐ janmanah̐ padam̐ ||

According to Someśvara, *Kalinga Vana*, *cedi-kāruśa vana* and *Daśārna vana* were the best forests for elephants; the medium quality elephants were available from *Āṅgireya* and *Prācyā vana*. Finally, the *Aparantavana*, *Pañcanada vana* and *Saurāstravana* were the residences of worst type of elephants.

So, from the various references, it is evident that the people of ancient India used to think in terms of eight Forest Divisions.

The chapter, *Vana vargādhīyaya* of the *Vṛkṣāyurveda* of *Parāśara*²⁰ further illuminates us about the distribution of forests in India. This text gives the names, discription and distribution of forets as follows: *Chaitra-ratha-vanam*, *Kālaka vanam*, *Kirāta-vanam*, *Pañcanada vanam*, *Pṛācyā-vanam*, *Vedi-kāruśaka vanam*, *Āṅgireya-vanam*, *Kalingaka-vanam*, *Daśārnaka vanam*, *Aparānta-vanam*, *Saurāstra-vanam* etc.

This Parāśara of *Vrksayurveda*²⁰ is identified by Sircar with the Paṛāśara of *Caraka Saṁhita*. It is said in the beginning of *Vṛkṣāyurveda* that in the *Chaitraratha* Forest, the Ṛsis headed by *Bharadvāja* assembled in a conference and asked Parāśara to give knowledge about the herbs and plants which were considered beneficial to the human being. This *Chaitra-ratha-vana* was situated somewhere near the beautiful *Mānasasarovara* (*Vanam Caitraratham ramyam Māna sasarah sobhitam, Vṛkṣāyurveda Bijotpattikāṇḍa*)^{Ch-1}. We get the reference to *Kālaka-vanam* (near Allahabad) in *Baudhāyana Dharmaśutra* in relation to the definition of *Aryāvarta*.

In addition to the list of the names of *vanas* in *Viṣṇudharmottara* we get two more names viz., *Aṅgīreyavana* and *Kaliṅgaka-vana* in *Manosollasa* (1,2.174-81). But the names of *Caitraratha-vana* and *Kirāta vana* are missing in all the texts other than the *Vrksayurveda*.

However, the resemblances in the names and locations of the forests, in ancient India as appear from the *Arthaśāstra*, the *Dharmottara Puṛaṇa*, *Manosollasa* and the *Vṛkṣāyurveda* of *Parāśara* provide sound evidence that the dense forest tracts persisted over a long period and the ancient Indians were aware of the forest resources.

Identification of the Forest Divisions ; The task of locating the forests in eight regions of ancient India as depicted in the *Arthaśāstra* is not very difficult.

Prācyā or the Eastern Division of ancient India has been identified as the forested land lying to the east of the *Kālaka-vana* near *Allāhābād* or *Vārānasi*. This was also named as *Mahāvana* and

was comprised of Nepal, Bihar and a considerable portion of Uttar Pradesh. Evidently it extended to the north as far as the Himālayas.

The *Kāruśaka vana* roughly indicates the forest tracts which extended from Bundelkhand area upto Mirzapur in U.P. In the *Mānasollāsa* the *Kāruśavana* is associated with the name of the *cedi*. The *cedi* denotes the Kalacuris of Tripuri near Jabbalpur in Madhya Pradesh. So, if we draw a line from Bundelkhand to Jabbalpur and connect it with Mirzapur touching Beghelkhand we shall be able to form an idea about the extent of the *cedi Kāruśa vana*. But the relevant stanza in *Mānasollāsa* clearly gives indication that the *cedi Kāruśa vana* was extended still further upto the mountain range of the *Kośala* country in the Raipur Bilaspur region in Madhya Pradesh.

The stanza is as follows (1.2.174 - 75) :

Tripuryām kośāl - adṛāu ca ve (cc) di

Kāruśakm̄ vanam |

Śṛikṣetram̄ Gauḍa - vangālam = āngireyam̄ vanam̄ smṛtam̄ ||

As the name '*Śṛikṣetram* occurs with *Gauḍa - vangālam*, the *Āngireya vana* probably covered *Śṛikṣetra* i.e. Puri in Orissa on the one end and *Gauḍa-vangāla* on the other. On the basis of the description given in the *Mānasollāsa* (1.2.176-77), Dr. Sircar identifies the *Daśārnaka* forest with the area which covered the *Śṛiśaila* (Nallamalur range) in Kurnool of Andhra Pradesh, *Vedaśaila* i.e. the Travancore hills and the southern spurs of the Western Ghats.

We get references to *Daśārṇa* in *Mahābhārata* (11,5-10) as well as in the *Meghadūta* (24-25). In *Kiṣkindhyā-kāṇḍa* of the *Rāmāyana* *Daśārṇa* country is connected with those of the Mekalas and Utkalas where Sugrīva sent his monkey army in quest of *Sītā*. There are references in *Karṇaparva* and *Droṇa parva* of the *Mahābhārata*. A *Daśārṇa* King named Kṣātradeva fought valiantly on the elephant back in favour of the *Pāṇḍavas* and in this connection it is mentionable that the *Daśārṇa* that *Daśārṇa* warriors could fight best on elephants. Probably this *Daśārṇa* forest lay far away from the *Daśārṇa* country near Bhopal in Madhya Pradesh though Chatterjee seeks to locate this forest in the east of Malwa. But in the *Viṣṇudharmottara* the description about the location of the *Daśārṇaka* runs thus :

Bilvaśailam Vetravatī Daśārṇam

ca Mahāgirim I

teṣāṃ Daśārṇakāṃ madhye

puṣpadantasya kānanam II

It was bounded by the *Bilvaśaila*, the *Vetravatī* river, the *Daśārṇagiri* and the *Mekāla*. In *Rāmāyana* also, the *Daśārṇa* country is connected with those of *Mekālas* and *Utkalas*.

However, at present it is very difficult to locate this *Daśārṇaka vana* with full accuracy.

On the basis of the description of *Vāmana*'s forest given in *Vāyūpuṛāṇa* (VP 11.8.234), Sircar¹⁸ likes to locate this forest between "*Utkala* (about N. E. Orissa) and the *cedi* country (in the Jabbalpur region).

Chatterjee² wants to locate it to the north of Betwa river in the former Goalior state i.e. he wants to push it towards slightly western direction though he also acknowledges the difficulty for locating this forest exactly due to paucity of evidences. Dr. Sircar also agrees that the language of the description of the *Vāmana* forest is defective.

The *Viṣṇudharmottara* states that *Kāleśavana* was bounded by the *Vindhya*, *Sahya*, *Utkala* and the *Dakṣiṇa Samudra* (Indian ocean) (VD. 11. 251.30-31) probably this *kāleśa vana* is identical with the *Kalinga vana* of *Mānasollāsa*. The *Mānasollāsa* describes the boundary of this forest as

'*Vindhyādri-Citrakūṭā-dri-kaliṅga-Drāviḍ-āśritam* |

Vanam Kalingam nāma samudravadhi kīrtiyate ||

This forest extended from *Vindhya*, covering *Citrakūṭa* hill, the *Kaliṅga* and *Drāviḍa* countries upto the sea (Indian ocean).

The *Citrakūṭa* has been identified by some with *Citrakūṭa* near *Kālāñjara* in the Banda district.²¹ *Rama* and *Lakṣmaṇa* came at the foot of the *Citrakūṭa* hill in the Malava country. Here the forest was so very thick that it was difficult to find out any trace of human civilization.

The *Aparānta* forest extended from the *Sahyādrī* or Western Ghats upto *Bhṛgukaccha* on the mouth of the *Narmadā* river. This forest region is corroborated by the *Periplus* also as has been already mentioned.

The boundary of the *Saurāstra vana* described in *Viṣṇudharmottara* and the *Mānasollāsa* is almost the same. This forest is stated to have extended from *Dvārāvati* (*Kuśasthali*), included *Avantī* (west Malwa), the *Arbuda* mountain (Mt. Abu) and the *Narmadā*. This forest may be taken to be the same as the modern Gir Forest in *Saurāstra* (Kathiawad).

The *Pañcanada vana* was bounded by the Himalaya in the (north) *Kurujaṅgala* in the east and the junction of the Indus and the sea (Arabian sea) in the south. According to *Rājatarangini*,²⁰ this foest was bounded by *Kālañjara* on the borders of Kashmir in the west. In addition to these names of forests we should include the names of *Dandakāraṇya* mentioned in the *Rāmāyaṇa*, the *Naimiṣāraṇya*, recorded in the *Mahābhārata*²¹ and *Mahākāntāra* mentioned in the Allahabad Pillar inscription of Samudra Gupta.²⁴

The *Dandakāraṇya* which is celebrated in the *Rāmāyaṇa* in connection with the episode fo Rama's exile, seems to have covered almost the whole of central India from Bundelkhand region to the river *Krsna*.²¹

The *Dandakāraṇya* along the *Vindhyas* practically separated the *Majjhimadēśa* from the *Dakṣiṇāpatha*.

Naimiṣāranya is generally identified with Nimsar in the Sitapur district of Uttar Pradesh. It is situated on the bank of the Gumti river. Nārada was honoured by the sages when he visited *Naimiṣāranya* (*Padmapuṛāṇa*, *Uttarākāṇḍa*, 77-78). Maḥākantara was a forest kingdom probably comprising parts of the Jaso and Ajaygadh states in Bundelkhand.²

4.5. The Ātavika Rajyas

Besides, most of the *Puṛānas* say of *Āṭavyas*. The *Vāmanapuṛāṇa* (Vap. 13.47-49) says about the *Āṛanyas*. Probably both the words mean the people living in the forest region. That there were people of *Atavi* within the empire of Aśoka is proved by inscriptional evidence²³.

In the Allahabad Pillar inscription Samudra gupta is said to have made all the *Āṭavikarajas* his servants.²⁴

In two inscriptions, Hastin is described as master of *Dabhala* and eighteen forest kingdoms²⁴ which extended from Jabbalpur across the whole of Chhota Nagpur.

So, it appears from the *Arthaśāstra*, the puranic texts, *Mānosollāsa* as well as epigraphic references that dense and vast forest tracts existed for a long period and the ancient Indians were aware enough of the physical boundary of the forested areas and their resources and classified them according to their geographical location.

A critical analysis of the evidences already mentioned provides an impression that the vegetation and forests covered far more extensive tracts than those of the late periods in Indian History.

It is evident that the Himalayan and sub-Himalayan zones had been under a cover of dense and luxuriant forests. But the occurrence of the names of innumerable number of plants, trees, bushes, grasses and the like indicate that there were varied genera and species of vegetation. Dense Forests were the abode of big animals like elephant, tiger, lion etc.

There was dense forest infested with elephants in the vicinity of Benares is evident from *Kasāya Jātaka*. Besides general references to grasses, there is specific mention of two species of grasses in the *Jātaka* stories, " *Kuśa* grass and *Munja* grass. In addition to these we get references to thorn-brakes and shrubs.

According to *Kāmaṇḍaka*²⁴ forests were divided into two groups, *Kuñjaravana* and *Kaṇṭakavana* (Kam. IV 51,52 ; XV 19-21). *Kuñjaravana* i.e. the elephant forest is the same as the *Gajavana* of the *Viṣṇudharmottara Puṭana* and the *Nāgavana* of the Pillar Edict V of Aśoka.²⁵ *Kuñjaravana* in ordinary sense denotes dense forest and *Kaṇṭakavana* means the thorny shrub forest.

4.6. Development of Imperial Control on Forests

Before the 6th century B. C. , there was no state control over the forests, and people were free to utilise its resources, when they needed. The main reason for such a situation was that imperialism

was yet to take its full shape. A change came with the birth of imperialism in Northern India in or about 543 B. C. as this year was ear-marked by the accession of king Bimbisāra to the throne of Magadha.

The imperial authority gradually became conscious of the forest resources and considered it as source of revenue.²

But with the establishment of Mauryan Imperialism, the forest came under the supervision of the state more effectively. From Kautilya's *Arthśāstra*³ it is abundantly clear that the state authority completely realised the importance of forest resources for the benefit of state craft and rules were framed for their proper organisation. There is hardly any scope to deny that under the Mauryas, there was more organised efforts for colonisation of uncultivated tracts of lands. It is true that an attempt had been made in this period for conservation of the forests and its living resources by a full fledged department with a Director at its head,

That the forests was one of the main components of the sources of revenue is clear from the *Arthśāstra* (KA. 11.6.1). Kautilya has given a clear definition of what is to be called 'forests'.

" Enclosures for beasts, deer-parks, forests for produce and elephant forests, - these constitute ' forests' he says (KA. 11.6.6) ("*paśumrgadravyahasti-vanaparigraho vanaṁ*").

It is very difficult to prove that there was any separate unit of the government to run the administration and management of the

forests before the Mauryas. It is for the first time in the Indian History that Kauṭilya mentions the post a Director of Forests produce (KA. 11.17.1).

Kāmaṇḍaka also declares the forested land and elephant forests as one of the main sources of the state-income (*Astavarga*) (Kam. V. 78,79). The economic importance of forests is also emphasised by Śukra²⁷ (Su. 11. 211-212).

In the section *Bhūmicchidrabidhānaṁ* of the *Arthaśāstra* the king is advised to establish animal-park, forests for produce and elephant forests on the land which are not suitable for agriculture.

"Animal park for the king's recreation with a single entrance protected by a moat, containing shrubs and bushes bearing sweet fruits, having trees without thorns, with shallow pools of water and stocked with tamed deer and (other) animals, containing wild animals with their claws and teeth removed (and) having male and female elephants and cubs useful for hunting(should be established). More parks should be established for the animals where all animals are (well comed) as guests. Naturally, in these parks full protection was assured (KA. 11. 2.3.4.)".

Regarding the forest which are called *dravyavana*, Kauṭilya says, he should establish, one each for the products indicated as forest produce, as well as factories for goods made from forest produce and (settle) foresters, attached to the produce forests (KA. 11.2.5). Here it is very significant that these forests for produce played a very important role in the economic life of the forest people in Ancient India.

Besides, there is clear cut instruction for establishing forests for elephants on the border of the kingdom and these forests should be guarded by foresters. The Superintendent of the elephant forest was entrusted with the full charge of protecting the elephant forests whether on the mountain, along a river, along lakes or in marshy tracts. He should have clear knowledge about the entrances and exits of the forests (KA. 11.2.6.7).

During this time, the imperial kingship was trying to assert its authority over every possible source of revenue and income of the state, and warfare became a regular feature of the day. In *Arthasāstra*, we notice that by this time elephant was established as an important component of the war machinery. So, a full fledged department under the headship of *Hastyādhyakṣa* or the Superintendent of Elephant (KA. 11.31.1) was established.

It is clear that besides the animal parks, there were two types of forests, one for forest produce and the other for elephants and there were distinct posts for Supervisors or Directors for smooth running of these two departments and their respective duties and responsibilities were specified.

Duties and responsibilities of the Director of Forest Produce:

(1) The Director i.e. the *KṠpyadhyakṣa* was in charge of collecting the forest produce and starting factories for finished products with the natural produce of the forests.(KA.11.17.1,2).

(2) He should impose fine for cutting down or causing damage to the trees without permission of proper authority. However, there was provision of relaxation in case of distress (KA.11.17.3).

(3) The Director should have clear knowledge about the quality of wood obtained from the trees. He should classify the strong trees such as *sáka*, *tinisá*, *dhanvana*, *arjuna*, *madhūka*, *tilaka*, *sála*, *śimśapā*, *arimeda*, *rājādana*, *śirīṣa*, *khadira*, *sarala*, *tāla*, *sarja*, *aśvakarna*, *somavalka*, *kuśa*, *āmra*, *priyaka*, *dhāva* and others. This group of trees was used as timber because of hard quality (KA. 11.17.4).

4) *Utaja*, *cimiya*, *cāpa*, *venu*, *vaṁśa*, *sātina*, *kantaka*, *bhāllūka* and others constituted the group of reeds (KA. 11. 17. 5).

5) *Vetra*, *śikāvalli*, *vāśī*, *śyāmalatā*, *nāgalatā* and others were grouped as creepers (KA. 11.17.6).

6) *Mālatī*, *mūrvā*, *arka*, *śana*, *gavedhukā*, *ataśī* and others constituted the group of fibre plants (KA. 11.17.7).

7) The raw materials for making ropes were *munja*, *bālbaja* and others (KA. 11. 17.8)

8) The leaves of *tāli*, *tāla* and *bhurja* i.e. the writing materials were distinguished (KA.11.17.9).

9) For medicine, in those days, people were highly dependent on plants and herbs. It was the duty of the Director of Forest produce to distinguish them.

All kinds of bulbous roots, fruits and others which had medicinal properties, were to be preserved (KA. 11.17.11).

10. He should collect the poisonous snakes and insects and preserve the venom in pots for the purpose of selling. It was also the duty of the Director to collect the skin, bones, bile, tendons, eyes, teeth, horns, hooves and tails of the lizard, seraka, leopard, bear, dolphin, lion, tiger, elephant, buffalo, camara, *srmara*, rhinoceros, bison and gavaya and also of other deer, beasts, birds and wild animals.

In ancient time, the defence of the country was largely dependent upon the supplies of wood from the forests. The logs of hard woods were stored and were used for setting up palisades for the protection of the cities as is evident from the *Indica of Megasthenes*. The horns of the rhinoceros and buffalo, the tusks of the elephants, wood and bamboo roots were used for the hilts. Leather constituted the essential element for making various types of defence equipments and dresses. Naturally the superintendent of the armoury had to keep close contact with the Department of forest produce. (KA. 11.18.20).

The Director of the forest produce should have remained careful of the proper protection of trees, plants, herbs, animals and such other natural resources. Because any fraudulent activity concerning forest produce was faced with punishment of fine (KA. 11. 5.9). The forest produces were accepted by the royal store house after proper examination by a bureau of experts. So, it is reasonable to believe that the subordinate employees under the Director of forest produce had to remain conversant with each and every matter relating to the improvement of the forests.

4.7. Superintendent of Elephant Forests

There is clear-cut instruction for establishment of forests for elephants in the *Arthaśāstra* (KA. 11. 2. 6).

It is already noticed, that elephants became an indispensable component of war machinery during this period. Kauṭilya discusses in some detail the quality of elephants, their capture and care as well as the conservation of the elephant forests. The elephant forests in the frontier region were undoubtedly inhabited by food gathering tribals. These forest dwelling people in the words of Kautilya were trappers, śábaras, pulindas, chandálas (KA 11. 1. 6).

These forest people were advised to be utilised as forest guards (KA 11. 2. 6). The superintendent of the elephant forests was a separate administrative authority, since in the list of the government officials as depicted in the *Arthaśāstra*, the name of *Nāgavanadhyakṣa* is separately mentioned. A large number of employees like forest guards, elephant keepers, foot chainers, physicians, trainers and group of attendants served under him (KA. 11.2.10). They were to observe strictly the different behaviour of the elephants and had to maintain records of each and every elephant.

Measures Adopted for Protection of Elephant Forests

(1) The Superintendent had to keep sharp watch over the elephant forests with the help of guards whether it was situated on the mountain, on the river bank or along a lake or in a marshy tracts of land (KA. 11.2.7).

(2) The forest guards were authorised to kill any one slaying an elephant (KA. 11. 2. 8.).

(3) A person bringing a pair of tusk from elephant who died naturally, should be rewarded with four *paṇas* and a quarter (KA. 11. 2.9).

(4) The crimes of damaging produce-forest or an elephant forest by fire was dealt with capital punishment (KA. IV. 11. 20).

4.8. Reserve Forests : The Abhayāraṇyas

The Mauryan kings maintained some forested areas as hunting recreation. These reserve forests contained shrubs and bushes bearing sweet fruits and trees having no thorn. The wild animals in these forests were shorn of their teeth and claws before being released for pleasures of the royal house. Another type of animal parks were also established where all animals were welcomed as guests and given full protection (KA. 11. 2.3.4). Besides these reserve animal parks, forests were granted to the ascetics for veda-study and sacrifices. Full safety was promised to the inhabitants of these forests. A very relevant example is the *Tapovana* of the sage *Kaṇva*, as depicted by Kālidāsa.²⁸ Though, the composition of Kālidāsa was of a much later date, yet it is true that such practice of granting wild area to the priest class continued through the ages. That all the creatures living in such class of forests were assured of their safety, is evident from the following quoted lines from the first act of the *Abhijñāna Śakuntalam* when the king Duṣyanta was just making an attempt on the life of a deer in the bordering area of *tapovana* of *Kaṇva* the hermits of *tapovana* restrained him by saying

" King, the deer belongs to the hermitage, it should not be killed, it should not be killed (AS. Act.I. 13)". The slaughter of animals in such forests were possibly totally prohibited. This is also indicated by the indifferent behaviour of the deer in the tapova na, who paid little care to the sounds of the chariot (AS. ACT. I. 14).

4.9. Game Laws

The preservation of games has become an indispensable part of preservation of forests in modern times. Attempts are being made by the state authority to protect the trees and plants as well as the beasts of the jungles. In ancient India also, unnecessary and wanton destruction of life was prohibited.

The Supervisor of (Animal) slaughter was entrusted with the responsibility of controlling the killing of animals. His duties were as follows:

(1) the supervisor of slaughter 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, the middle fine on householders (for these offences) in reserved park enclosures (KA.11.26.1).

(2) For binding killing or injuring fish and birds whose slaughter is not current, he should impose a fine of twenty six paṇas and three quarters (for binding) deer and beasts, double (that). Of those whose slaughter is current (and) who are not protected in enclosures, he should receive one-sixth part, of fish and birds one tenth part more, of deer and beasts, duty in addition (KA 11.26.2.3).

(3) In order to make up the loss of wild animals and birds caused by death, one-sixth of the total number of all the different species of them should be set free (every year) in a forest preserve (wild life sanctuary)

(4) Sea-fish having the form of an elephant or a horse or a man or a bull or a donkey, or those from lakes, rivers, tanks or canals, curlew, osprey, gallinule, swan, ruddy goose, pheasant, bhṛngarāja, cakora, mattakokila, peacock, parrot, and *madanaśārikā*, which are birds for sport and auspicious (birds), also other creatures (whether) birds or deer should be protected from all dangers of injury. For transgression of this protection, the first fine for violence shall be imposed.

These Game-laws found in the *Arthaśāstra* were probably in force during the reign of Maurya rulers. But the great Maurya Emperor Aśoka laid down injunctions prohibiting the general destruction of life. These injunctions are found in his famous rock edict and pillar edict.

He brought the Game-Laws under the category of *Dhammaniyamas* or Laws of piety. Various animals have been mentioned in the Rock Edict I and in the Pillar Edict V. He enacted the game laws to minimise their slaughter and prohibited the performance of animal sacrifices.

Edict No. I forbade the general destruction of life both in his own kitchen and in his empire. Aśoka's Pillar Edict in which we find his *Dhammaniyama* or regulation of piety, has been translated by Hultzsch.²⁵ This is quoted here. King *Devānāmpriya priyadarśin* speaks thus , " When I had been) anointed twenty-six years, the

following animals were declared by me inviolable, viz., parrots, mainās, the aruna, ruddy geese, wild geese, the nandimukha, the gelata, bats, queen-ants, terrapins, bone less fish, the vedaveyaka, the Gangā-puputaka, skatefish, tortoises and porcupines, squirrels (?), the srimara, bulls set at liberty, iguanas (?), the rhinoceros, white doves, domestic doves (and) all the quadrupeds which are neither useful nor edible. Those (she-goats), ewes and sows (which are) either with young or in milk were inviolable and also those (of their) young one (which are) less than six months old. Cocks must not be caponed. Husks containing living animals must not be burnt. Forests must not be burnt either uselessly or in order to destroy (living beings). Living animals must not be fed with (other) living animals. Fish are inviolable and must not be sold, on the three *chāturmāsis* (and) on the *Tishyā* full-moon during three days (viz) the forteenth, the fifteenth, (and) the first (tithi) and invariably on every fast day. And during these same days also no other classes of animals which are in the elephant-park (and) in the preserves of the fisherman must be killed on the eighth (tithi) of (every) fortnight, on the fourteenth, on the fifteenth, on *Tishyā*, on *punarvasu*, on the three *chāturmāsis*. (and) on festivals, bulls must not be castrated, (and) he goats, rams boars, and whatever other (animals) were castrated (otherwise) must not be castrated (then).

On *Tishyā*, on *Punarvasu*, on the *chāturmāsis*, (and) during the fortnight of (every) chaturmasi, horses (and) bullocks must not be branded, until (I had been) anointed twenty-six years, in this period the release of prisoners was ordered by the twentyfive times."

Aśoka in his very first edict, holds that no sacrifices should be performed by immolating living beings and no convivial gatherings

held as he found many faults in them.

Excursion : From his Rock Edict VIII we learn that in his tenth regnal year, Aśoka totally abolished the royal hunt. The pleasure excursions (*vihārayātrā*) typified by hunting expedition (*magavyā*) were replaced by the *dhammayātā*.

Earlier, the hunting expedition was a favourite pursuit with the kings of India. We may quote here the description of Strabo²⁹ of the occasion of the hunting expedition.

The king leaves his palace to go to the chase, for which he departs in Bacchanalian fashion. Crowds of women surround him, and outside of this circle spearmen are engaged. The road is marked off with ropes, and it is death, for men and women alike, to pass within the ropes. Men with drums and gongs lead the procession. The king hunts in the enclosures and shoots from the back of an elephant. Of the women, some are in chariots, some on horses, and some even on elephants, and they are equipped with weapons of every kind, as if they were going on a campaign. The picture of entrance and exit of the king into and from the palace for games or others depicted in the *Arthaśāstra* (KA 1.21.23 26) almost resemble with that of given by Strabo. It is evident from various references that pleasure hunting was a part of king's routine work. But Aśoka stopped this practice in the tenth regnal year of his reign. The rock edict I, the rock edict VIII and the pillar edict V, prove beyond doubt that Aśoka's purpose was to stop the unnecessary killing or torture of any animals whether useful or not. The abandonment of the practice of going on hunting excursion must have been in accordance with his Law of Piety.

There is some difference of opinion among the scholars in explaining the meaning of the word's three *Chāturmāsis* when killing of animals and fish was prohibited.

According to Barua " the fish and other creatures got relief for not less than seventy-two days in the year, calculated at the rate of 3 days in every lunar half-month, viz., the first, the eighth and the full or new moon." The three *chāturmāsis* and Tishyā full moon days are all included in the list of full moon days throughout the year. Chatterjee gives the number of non-slaughter day as 72 days in a year, by explaining the three *c̄aturmāsis* days and the day of the *Tishyānaksatra* (birth star of Asoka) as full moon days.

However, it is reasonable to believe that a quite good number of days in a year were declared as non-slaughter days. Kautilya had recommended in his *Arthasāstra* that the king (in a conquered territory) should order the stopping of slaughter for half a month in every four months, for four nights (and days) on the occasions of full moon nights, for one night (and day) on the days of the constellations of the king and the country. He should prohibit the killing of females and young ones and the destruction of a male's virility. (KA. 5.12.13).

Hora³⁰ after a careful observation of the prohibitions laid down by Aśoka in pillar edict V, expresses his view that " There is some indication that Aśoka's pillar Edict V records an. advancement of knowledge over what Kautilya had recommended in his *Arthasāstra* about 25 to 50 years earlier".

Aśoka's intention was to minimise the slaughter of and inflictions of cruelty on living beings by introducing restrictive regulations, the ultimate aim of which was to serve the purpose of conservation of living resources. This becomes clear when we notice the scientific analyses of Aśoka's fish legislation by Hora³⁰. He says that the peak breeding period of India's principal food fishes is July, August, and September. But Aśoka's prohibition period extends upto the middle of November. This extended period is also scientifically logical because after breeding in shallow areas or upriver the spent fish fall back to their normal habitats. The young also move down to safer habitats after the rains are over. The young and the weakened spent fishes needed protection and it is indeed remarkable that even this was thought of in the remote ancient age by that Great Emperor. This sets an example of highest degree of piety extended to a newly spent mother fish.

By the time of Mahāvira and Buddha, settled agriculture and pastoralism paved the way for acquiring large surpluses which made ever increasing pressure on forested land and living resources. More forests were to be utilised for extending the horizon of agriculture. The *Brāhmanial* pantheon, which incurred slaughter of hundreds of animals and burning of vast tracts of forests under the guise of fire sacrifices taking the assistance of the *Kṣatriya* princes as is noticed in the incident of *Khāṇḍavadahana* in the great Epic "*Mahābhārat*" failed to project itself as congenial to the changed socio-economic order. The Buddha raised his strong voice against the killing of cows. Buddhism and Jainism by abandonment of *Yajña* rituals introduced a new belief system befitting with the changed circumstances leading to the beginning of the convention of prudent use of resources and conservation practices.

Henceforth, the *Brāhmanical* literatures also advocated for non-injury to both plants and animals as has been already discussed.

Emperor Aśoka thought it necessary to create an environment of protection of lives and brought the Game Laws under the category of *Dhammaniyama*. By introducing injunctions against any unnecessary slaughter of animals, Aśoka attempted to inspire the people with a feeling of Love for animals which ultimately proved very effective for conservation of living resources.

4.10. An overview of post Mourya period

There is hardly any evidence to prove that there developed any new system of forest administration, different from the ideas of Kauṭilya in the smaller states that had developed in India in the post Maurya period. Probably, it will not be unjustified to think that the basic structure of forest department in the later ages was more or less similar to that of the *Mauryas*.

With the rise of the Imperial Guptas, the vast forest tracts stretching throughout the Gupta empire naturally came to be regarded as important sources of revenue. The importance of trees, plants, shrubs, grasses, and woods in a kingdom was highly valued (Śu. 1. 425-28).²⁹

The forest in this period did not remain unexplored. Śukra's advice to connect human settlement with the forests with network of *Rājamārgas* points to the fact that during this period, state authority became more and more conscious of the forest resources and began to pay more attention for developing the communications with the

forested region with the locality. Śukra 's advice is : In a forest of six *yojanas* (i.e. forty-eight miles) the best *Rājāmarga* is to be constructed, in the middle the average and between the two, the worst (?) (Śu. 1. 528-529)

The best *Rājāmarga* should be thirty cubits wide, the average twenty cubits and the worst fifteen cubits only (Śu. 11. 207-208).

Sumantra and *Amātyam* these two state officials had to look after the affairs of revenue earned from forest (*Araṇyosambhaba*) and the settlement of the forested land. (Śu. 11. 211-212).

The state officials as Superintendent of elephants and Superintendent of horses discharged duties of their respective departments (Śu. 11 256, 260-263)

The Superintendent of parks and forests (*Ārāmādhpati*) had to remain responsible for growth and development of flower, fruit, trees and treatment against diseases of plants (Śu. 11317-319)

The king is also advised to extend the boundaries of forest area by means of afforestation (Śu IV, 91-93). The trees which had thorns were to be planted in forests (Śu. IV, 113-114).

During this age, rampant destruction of living resources was discouraged and hunting could not be done without prior royal permission (Śu I, 603-8). The king also in course of his hunting expedition was not allowed to kill the animals which were not wild, and cruelty was always discouraged (Śu. I. 665 - 69).

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