

## Kauṭilya's Arthaśāstra on Forestry

Manubendu Banerjee

मानबेन्दु बैनर्जीमहाभागः कौटिलीयेऽर्थशास्त्रे प्रतिपादितानां वनसम्बन्धिनां विचाराणां सङ्ग्रहणं कृत्वा, राज्यस्य समाजस्य च वनजन्यानाम् उपकाराणां विश्लेषणं कृत्वा, वनानां विभागं प्रदर्श्य, तज्जन्यसस्यानां, काष्ठादिसामग्रीणां, चर्मादिसाधनानां, खनिजानां सम्पत्त्या राजकोषस्य समृद्धतां प्रतिपाद्य, आटविकानां सामदानभेदाद्युपायैः वशीकारद्वारा राज्यसंरक्षणप्रयोजनसिद्धिं प्रतिपाद्य विभिन्नवनजन्यायद्वारा कोषवृद्धिं निरूपयति।

Haphazard handling of nature is often and again causing much loss to the existence of living beings throughout the world. Forest is the vital part of nature and its conservation and sustainable management help people and animal to live in healthy ecological atmosphere. Nowadays deforestation is bringing to us ecological imbalance and an overall deterioration of the resourceful world of nature. Since the time of the Vedas, the earliest literature of our country, minute attention was laid on the production, preservation and management of forests, and by this way, directly or indirectly, environmental consciousness was maintained by the people around their surroundings. Days of those pristine glories are no more in existence. In our society, wrong application of scientific and technological knowledge and subsequent human hazards leading to the mass annihilation of natural treasures, including the forests, has totally changed the global atmosphere. In India deforestation had been taking place on a large scale, causing thereby widespread environmental concern and forcing the Government to enact the forest conservation Act, 1980 with its subsequent amendments. Earlier in 1894 India introduced the forest policy, and it was revised in 1952 and again in 1988; the main plank of the last mentioned policy is protection, conservation and development of forests.

Early Indian texts such as the *Vedas*, *Upaniṣads*, *Āraṇyakas*, Epics, *Purāṇas* and the entire classical Sanskrit literature furnish as with innumerable instances on conservation, preservation and management of forests, which people considered to be the inseparable part of their life. Numerous descriptions of the bond between human beings and forest life are available in the Sanskrit writings.

Kauṭilya, the brilliant minister of the Maurya king Candragupta, has presented us the illustrious work *Arthaśāstra* which provides detailed instructions on afforestation (i.e. the scheme of plantation of new forests), non-injury to plants and emphasizes on the forests as the reservoirs of wealth, because the forest- produce was one of the main sources of income to the royal treasury. For the word “forest” (*vana*), Kauṭilya has given the definition that forests include enclosure for beasts, deer-parks, forests for produce and elephant-forests (*paśu-mṛga-dravya-hasti-vana-parigraho vanam* -AŚ.- 2.6.6). Forest was one of the sources of collection of revenues, the other ones being fort, country, mines, irrigation-works (*setu*) etc ; the *Samāhartā* i.e. Administrator was in charge of general administration of these centres of revenue-sources (AŚ.-2.6.1). Kauṭilya, while advising the king to select a place for establishing a new village, instructs that at the boundary line of such a village there should be a forest along with trees such as *śamī*, *śālmālī*, milky trees, etc (AŚ.2.1.3.), which give the village a sylvan beauty. On a land not suitable for agriculture, utilitarian forests were laid down, such as, an animal park, which perhaps is a type of reserved forest, for the purpose of the kings’ recreations. A special type of animal forest was advised to be constructed where various types of animals were given shelter with their full protection (*sarvātithi-mṛgam mṛga-vanam*). This appears to be a kind of *Abhayāraṇya* or a zoological garden. Special forests with considerable areas were created for the settlement of ascetics and respected Brāhmaṇas devoted to the study of the Vedas. These two types are respectively called *tapovana* and *brahma-somāraṇya* (AŚ.2.2.2.).

Special care was taken while laying down the animal park which was one *goruta* (another name of *krośa* which is about 3.66 km.) in extent. It is an artificial forest having a single entrance, surrounded by a moat, having trees without thorns and some

trees bearing sweet fruits: it contains shallow pools of water, roaming deer and other animals, wild animals having their claws and teeth removed, and male and female elephants along with their cubs (AŚ.2.2.3.).Kauṭilya advises the king to establish several forests one each for the separate forest produce ( *dravyavana*) i.e. each large forest was to contain the group of a special type of tree, such as mango, or śāla, etc. and also forests for factories for producing goods from trees and also forests for securing other forests objects (AŚ.2.2.5). Factories were constructed separately for turning therein raw materials into finished goods ; however not all the factories were established inside the forests ; some were constructed outside the forest-area and elsewhere in the city. (AŚ.2.17.17) Kauṭilya advises the *Kupyādhyakṣa* to make arrangements, within the boundary of the forest-area, for the settlement of the foresters or forest-dwellers connected with the produce forests (*aṭavīmśca dravyavanāpaśrayāh* - AŚ.2.2.5) and they were to preserve and protect forests from various hazards.

There was a Director of forest-produce (*Kupyādhakṣa*) who was assisted by his subordinate officers acting as guards in the produce forests (*dravyavanapāla*). The Chapter named *bhūmichidraavidhāna* (AŚ.2.2) gives us the impression that new forests were to be planned, at the time of a new state having been established, on an unoccupied land and the land unsuitable for agriculture.. The Director of forest-produce was evidently under the control of Samāhartā, and in charge of setting up factories in the forests for producing serviceable articles from forest trees (AŚ.2.17.2). It is interesting to note that the Chief Ordnance Officer (*Āyudhāgārādhyakṣa*) used to supervise the business carrying out in respect of various types of forest-produce in the factories (AŚ. 2.18.20). It appears that as most of the weapons were produced in these factories, the said officer had to be conversant with the functioning in the factories. For the protection of the forests and of the production in the factories, large number of men including the Vanapālas were evidently employed for whom huge sums of money were spent. Dues (*deyam*) were fixed to those who used to cut forest trees and penalty (*atyayam*) was imposed on them for cutting or taking trees without paying the dues (AŚ. 2.17.3). In this connection

Kauṭilya maintains that dues, penalty, etc. may be waived in cases of distress (*anyatra āpadbhyah* –AŚ. 2.17.3).

It is suggested in the above statements that forest produce, such as, timber and various trees were to be freely used at the time of calamities like flood, attacks from tigers, fear from dacoits, etc. It appears that forests constituted a separate department under the supervision of the *Kupyādhyakṣa* and it may be presumed that all forests belonged to public sector. The way Kauṭilya has dealt with forest land and forest produce gives us the idea that the then country possessed vast forest areas and the King or the Government had indisputable sway over these natural resources.

The *Arthaśāstra* furnishes us with lists of principal forest produce (*kupya-varga*) starting with those of timber and plants. The group of trees with strong timber (*sāradāru-varga*) is as follows-

*Kupyavargah* : śāka-tiniśa-dhanvana-arjuna-madhūka-tilaka-sāla-śim śapa—arimeda-rājādāna-śirīśa-khadira-sarala-tāla-sarja-aśvakarṇa-somavalka-kuśa-āmra-priyaka-dhavādih (AS.2.17.4). Some of these trees have been identified as-

Śāka (teek)

Tiniśa (Dalbergia Ougeinensis)

Dhanvana

Arjuna (Terminalia Arjuna)

Madhūka (Bassia Latifolia)

Tilaka (Berleria Cristata)

Sāla

Simsapa (Dalbergia Sissu)

Arimeda (Fetid Mimosa)

Rājādāna (Mimosops Kauki)

Śirīśa (Mimosa Sirisha)

Khadira (Mimosa Cetechu)

Sarala (Pinus Longifolia)

*Tāla* (palmyra)

*Sarja*

*Aśvakarṇa* (*Vatica Robesta*)

*Somavalka* (a kind of white *khadira*)

*Kuśa*

*Āmra*(mango)

*Priyaka* (yellow *sāla* tree)

*Dhava* (*Mimosa Hexandra*) and such others.

Here in the above list, we find more than twenty varieties of timber. It has earlier been prescribed that each class of the above mentioned timbers having variform appearances was planted in separate enclosures, thus making divergent types of produce-forests (*dravyavana*). It is evident, therefore, that forestry as a practice originated in India in a remote period and much developed at the time of Kauṭilya, and at the same time the principals of forest conservation and sustainable management were well entrenched and guaranteed by the authorities of the state..

A list of bamboos and reeds of long diameter (*veṇuvarga*) is provided in the text –(*uṭaja-cimiya-cāpa-veṇu-vamśa-sātina-kaṇṭaka-bhāllūkādir veṇuvargah*) constituting *uṭaja* (a kind of bamboo, with soft thorns), *cimiya*(a kind of bamboo with thick bark and with no thorns), *cāpa*, *veṇu*( it is very hard and has a very small central aperture), *vamśa* (it has thorns and the space between any two of its knots is long), *sātina* (it is similar to that of *vamśa* but smaller than the latter), *kaṇṭaka* (according to the commentator *kunatta*, meaning a very big and long type of bamboo, bearing seeds like wheat), and *bhāllūka* (according to the commentator, *halluka*, which is a big and long type of bamboo having no thorns) (AŚ. 2.17.5 ). Those varieties of bamboos which are with big or small holes, soft surface, long space between the joints and without thorns, are meant for making flutes and bows.

The group of creeping plants (*vallivarga*) includes *vetra* (cane), *śākvallī*, *vāsī* (*Justicia Ganderussa* ; it bears flowers like

those of Arjuna), *śyāmalatā* (Ichnocarpus), *nāgalatā* (betel) etc.(AŚ. 2.17.6).

The group of fibrous plants (*valkavarga*) includes *mālatī* (Jasminum Grandiflorum) *Mūrvā* or *dūrvā* (panic grass), *arka* (Calotropis Gigantea), *śaṇa* (hemp), *gavedhuka* (Coix Barbata), *atasī* (Linum Usitatis Simum) and others (AŚ.2.17.7). *Muñja* (Saccharum munja), *balbaja*(Eleusine Indica)etc. are raw materials for preparing ropes (*rajjubhāṇḍa*) (AŚ.2.17.8).

Leaves purported for writing material and for other use are *tālī* (Corypha Taliera), *tāla* (Palmyra or Borassus Flabelliformis) and *bhūrja* (birch) (AŚ.2.17.9). Flowers giving concoction for preparing colour material are *kimśuka* (Butea Frondosa), *kusumbha* (Carthamus Tinctorius) and *kuṅkuma* (Crocus Sativus) (AŚ.2.17.10)..

Medicinal plants (*oṣadhavarga*) include Bulbous roots, roots, fruits, etc. (AŚ.2.17.11).

Kauṭilya has often advised the Kings to use poisons against their enemies. For the purpose of collecting poison various plants were made to grow in the forests. All the plants however cannot be identified. The group of these plants (*viṣavarga*) includes *kālakūṭa* (it is the secretion from leaves of fig-like tree), *vatsanābha* having leaves like those of *Nirgundi* ; *hālāhala* having blue and elongated leaves; *meṣa-śṛṅga* looking like the bud of a blue lotus; *mustā* - a variety of plant which is white as conch-shell; *mahāviṣa* bearing flesh colored fruit of the form of breast-nipple; *vellitaka* having the root like a monkey's testicles; *haimavata* being the product of the Himalayas and having long leaves; *kāliṅgaka* - a product of the Kalinga country and is like the *yava* (barley); *kolāsāraka* having fruits like those of rose-apple (*jambū*); *auṣṭraka* - a fruit shaped like the testicles of the camel; *gaurādara* - a bulbous root of black colour ; *bālaka* (also called *palaga* or *palanga* in the commentaries) having the shape of the long pepper and similar other poisonous plants. It is likely that all these plants were put in one and the same forest, and separate forests for the implantation of each of these trees are not obviously meant here. Likewise poisonous snakes and insects were kept in jars (*sarpāsca kiṭāh te eva kumbhagatāh*) somewhere in the forests. (AŚ.2.17.12).

Kauṭilya gives a list of skins flayed out of some forest animals for the use of domestic or other purposes. These animals are *godhā* (lizard), *seraka* or *sīraka* (porpoise or white-skinned *godhā*), *dvīpi* (leopard), *ṛkṣa* (bear), *śimśumāra* (dolphin), *simha* (lion), *vyāghra* (tiger), *haṣṭī* (elephant), *mahiṣa* (buffalo), *camara*, *śṛmāra khadga* (rhinoceros), *gomṛga* (bison) and *gavaya* (gayal). Kauṭilya adds that bones (*asthi*), bile (*pitta*), tendons (*snāyu*), eyes (*akṣi*), teeth (*danta*), horns (*śṛṅga*), hooves (*khura*), tails (*puccha*) of the above-mentioned animals and also of other beasts including deer, birds, and wild animals (*vyāla*) are also said to be collected by the officers under the supervision of Kupyādhyakṣas (*carma-asthi-pitta-snāyu-akṣi-danta-śṛṅga-khura-pucchāni, anyeṣām vāpi mṛga-paśu-pakṣi-vyālānām* - AŚ. 2.17.13). In the 14<sup>th</sup> *Adhikarana*, named *Aupaniṣadika*, Kauṭilya has shown how bones and other materials taken out of forest-animals were used for secret practices against the enemies.

*Kālāyasa* (iron), *tāmra* (copper), *ṛtta* (steel), *kāmsa* (bronze), *sīsa* (lead), *trapu* (tin), *vaiṅṛntaka* (mercury) and *ārakūṭa* (brass) are included in the group of base metals. These metals were intended for preparing ploughs, pestles, which provided livelihood (*ājīva*), and machines, weapons, etc. for protection of the city (*purarakṣā*) (AŚ. 2.17.17). It may be presumed that separate factories were established in forest zones for each class of production. In this context, Kauṭilya advises the Master of the Armoury (*Āyudhāgārdhyakṣa*) to be conversant with the raw, defence material in the forests and their qualities and to avoid any adulteration (AŚ. 2.18.20).

Although these metals come from mines, which are under the direct control of the Director of mines (*Ākarādhyakṣa*) (AŚ. 2.12), yet these have been noted here for the reason that forests or forest land at the time perhaps contained a number of mines. The Kupyādhyakṣa had nothing to do with these mines, but he was in charge of *kupyagrha* stationed in the city where wood etc. collected from the forests and processed in the factories were stored.

Among the forest-produce, there was also the group of containers (*bhāṇḍa*) made of *vidala* i.e. bamboo or cane

(*vam śavetrādīkr tam vidalam* – Mysore commentary) and of clay (*mṛttikā*) (AŚ.2.17.15).

Charcoal (*angāra*), husks (*tuṣa*) and ashes (*bhaṣma*) are the by-products from wood etc, for which some parts of the forests were allotted; special areas (*vāṭa*) were constructed for deer, beasts, birds and wild animals (*vyāla*); the forest land also provided enclosed space for fuel and grass (*kāṣṭha-tṛṇa-vāṭāh*) (AŚ.2.17.16).

Factories established in and outside forests area as already mentioned, were obviously purposed for manufacturing wares from the above forests such as wood, metal, cane, ropes and so on. The king had to depend on the Kupyādhyakṣa, for the latter was responsible not only for the protection and nourishment of the forests, but also for utilizing the forest produce to help the king in the welfare of his kingdom. Product of forests and also of the factories established therein or outside the forest greatly met the social requirements and also checked the possible damage that might be caused by the kings' opponents. Undoubtedly quite a substantial income came to the state from the forest wealth.

In the capital there was a store-house for forest produce (*kupyagrha*), built under the supervision of the Director of Stores (Sannidhātā) (AŚ.2.5.1). The store-house for forest produce of which timber was the principal commodity, was required to possess many long halls (*dīrghabahula-śālā*); adjacent to the walls of the halls some rooms were constructed, perhaps, for storing therein minor forest products (AŚ. 2.5.5).

Kauṭilya has not explicitly stated the importance of forests, for the very reason that since the Vedic period survival of the beings much depended on the forests and forest- produce. It is obvious that materials taken out of the forests meted the needs of the people of the city and these were exported outside the kingdom for exchange of other commodities. The importance of the forests has been upheld by Kauṭilya when he states that the king should protect the produce-forests (*dravyavana*), elephant forests (*hastivana*), irrigation works and mines which had been made in early times, and even if they existed in later times without any major interruption, attempt should be made to

establish new forests, factories etc, (AŚ. 2.1.39) to sustain larger extent of the breathing society.

A few years after the composition of AŚ, the great emperor Aśoka made it mandatory to plant medicinal herbs and trees, besides shade-trees along the roads and fruit plants on the water lands. In his second Rock Edict, Aśoka records his decision and execution of planting medicinal trees for the treatment of humans and animals. In some cases, when suitable medical herbs for humans or animals were not available, Aśoka had caused to import them and grown. Kauṭilya distinguishes two principal types of forests. The descriptions given above are concerned with the *dravyavana* or produce-forest; the other forest being the *hastivana* or elephant-forest which in Kauṭilya's time was probably a sanctuary.

Kauṭilya instructs the king to establish elephant-forests (*hastivana*) on the border of the kingdom and there chosen foresters were to guard the elephants (*aṭavyāraḥṣa*). The elephant-forests were under the supervision of a superintendent (Nāgavanādhyakṣa) who, with the assistance of the guards, protected the environment of these forests so that the elephants remained healthy and active. It may be pointed out that this Nāgavanādhyakṣa was different from Hastyadhakṣa (Superintendent of Elephants) whose duty was to train king's elephants and look after their physical fitness, for, a king's victory over his enemies largely depended on the elephants (*hastipradhāno hi vijayo rājñām* – AŚ.2.2.13) Elephant-forest could be made on mountains, along a river, beside lakes or a swampy land (AŚ.2.2.7).

It is evident that the *hastivana* had little economic value, for, elephants required to be maintained mainly for the purpose of war. It may be presumed that both kinds of forests (*dravyavana* and *hastivana*) belonged to the state. Besides the *mṛgavana* mentioned in AŚ.2.2.4, referring to the animal park, another *mṛgavana* (deer-park) has also been mentioned (AŚ.8.4.44) where deer lived in plenty (*mṛgāḥ prabhūtāḥ*) and benefited the countrymen with abundant meat and skin (*prabhūtamāmsa-carmopakāriṇaḥ*) and who could be easily controlled. Kauṭilya

advises that rogue elephants are to be cautiously caught from the elephant-forests, otherwise they ruin the country (AŚ.8..4.45).

Kauṭilya has not specified any strong measure for the protection of forest or forest-trees. But he has prescribed different types of punishment for causing injury to trees, their branches, fruits, creepers, etc. that constitute various parts of the forest or a park, Kauṭilya instructs the administration that in the case of putting fire to the produce-forest (*dravyavana*) or an elephant-forest (*hastivana*), the incendiary is to be burnt in fire (AŚ.4.11.20). This is a glaring example of serious concern of the state to protect forests. Under no circumstances destruction of a forest was not tolerated by the Administration.

For cutting off the shoots of trees in the parks in and near a city, that bore flowers and fruits, a fine of six *paṇas* was slapped on the wrong-doer; for cutting small branches the fine of twelve *paṇas* and for cutting big branches that of twenty four *paṇas* were imposed. Cutting of trunks and uprooting trees were considered serious offence for which due punishment is recommended by Kauṭilya. In the cases of damage caused to bushes and creepers carrying fruits and flowers, suitable fines were slapped. Fines were also levied in the cases of destroying trees in the holy places, in the forests meant for penance- groves and trees grown in the cremation ground. Kauṭilya has urged upon the people to preserve the prominent trees marked with royal seal ; distinguishable signs were to be put on trees to ascertain the boundaries (*sīmāvṛkṣeṣu*) and also on those grown in sanctuaries (*caityeṣu*) as also in the royal enclosures (*rājavanēṣu*). By such various courses of action Kauṭilya directly tried to restrict people's intentional or unintentional attempts at wrong-doings to the forest-property and at the same time endeavoured to check the problem of forest-ecosystem by not allowing setting fire to the forest, illicit felling of trees, encroachment and other unscientific treatment to the forest life.

Kauṭilya has often referred to Aṭavī and Āṭavika in the sense of the forest tribes who used to settle in forests beyond the boundaries of towns and villages. These tribes are said to be engaged in attacking people under cover of night, and robbed them in cash; generally they were many in number, fought

openly, and seized and ruined neighboring localities (AŚ. 8.4.41.43). An allusion to the forest chieftain's aspiration for seizing the throne from the king has been made; if the chieftain gathered power or strength to establish his own territory, the king is advised to win over other forest-lords with money or honour (AŚ.12.3.17). The king sometimes recruited troops from wild tribes (*aṭavībala*), but they were seen to be more anxious for plunder (*vilopārtham*) than for fight for the king. Such troops were apparently under the leadership of their own chieftains. (AŚ.9.3.18-20). There is enough reason to believe from Kauṭilya's statements that the forest-troops procured by the king to fight on his side maintained their detachment from the general army. For defensive fortifications, forest was one of the places where forts (*vanadurga*) were advised to be constructed for strategic reasons. The *vanadurga* was to be full of wagtail, water and thicket (*khañjanodakam stambhagahanam*). This fort was generally used as places for foresters or places of retreat of the royal persons in times of calamity (AŚ.2.3.2).

Kauṭilya was an efficient minister having the potentiality of highly successful in managing the state. The art of controlling the forest and their produce was made by him with sharp attention to the good governance which require amongst others a systematic collection of forest produce and utilization of the tracts of forest-land for various purposes. He was well aware that the existence of living beings is dependent very much on natural surroundings as well their components, such as, flora, fauna, water resources and large forests. To keep the people happy with a healthy environment and with supplies from forest regions, and also for the purpose of enriching the royal treasury, Kauṭilya, led by his empiric knowledge, has given enough concentration on the overall maintenance of all the productive forest of the state.

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