

Review Paper

Conservation: A New Science or an Old Perception

Das Pulak^{1*} and Purkayastha Pinki²

¹Dept. of Environmental Science, Indira Gandhi National Tribal University (IGNTU), Amarkantak, MP, INDIA

²Dept. of Environmental Science, Cachar College, Silchar, Assam, INDIA

Available online at: www.isca.in, www.isca.me

Received 7th April 2014, revised 6th June 2014, accepted 8th July 2014

Abstract

Present paper discusses about the way the conservation science has percolated across our perception through various traditions, cultural practices, taboos, and beliefs in India. These traditions and practices have intermingled with our religion, culture, and day to day socio-economical ethos and are silent player in conservation of biodiversity. In search of modern scientific solutions to the ever burgeoning ecological problems these factors are often overlooked, and hence need to be appreciated and preserved to maintain our ecosystems and our own existence.

Keywords: Biodiversity, conservation, India, traditional knowledge.

Introduction

Indian philosophical systems consider nature as the caring, divine mother, who is ready to provide everything we need for our survival. Today's science considers plants and animals as a unit consisting of genes and chemicals and not as a spirit while for indigenous societies these are very much their part of life and livelihood, and have their own significance associated with their past incidences¹. From the ancient times in India the attitude of human beings towards nature has developed a kind of preventive awareness in which they know the pain of other beings and wish the well beings of them. This is connected with the tenets of different philosophical systems like *samkhya*, *yoga*, *vaisesika*, *mimamsa*, and *Vedanta* and heterodox systems like Buddhism and Jainism. The traditions and practices are deep rooted in our ancient scriptures like *Vedas*, *Puranas*, and *Epics*, which consider the humans as only a part of nature and not the masters of this earth which includes all living creatures. These literary works has gradually molded the 'way of thinking' and ultimately the 'way of living'.

Conservation of nature and its biodiversity is an important component in the numerous traditions of India, co-evolved with the persistent historical interaction of societies with their environment. Knowingly or unknowingly, these traditions and practices were able to sustain till now.

These practices which are inherited from one generation to other with trial and error, ultimately manifests itself as wisdom or we may call it an 'Inherited wisdom'. The basic components of inherited wisdom are i. traditional knowledge, which talks about *what to do*, and ii. taboos, which says *what not to do*. Conservation is thus a common factor which correlates taboos, traditional knowledge, age old practices, ancient literatures and biodiversity (figure 1).

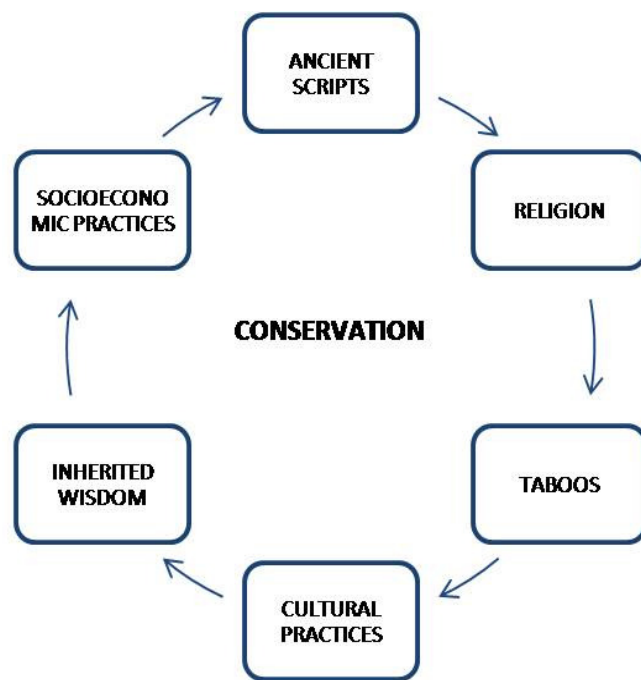


Figure-1
Various factors affecting the conservation in the country

Wisdom

The wisdom through experience and knowledge are possessed by families, clans, tribes, communities, and are inherited by successors year after year. Some tribes of Rajasthan know about ecological interactions of plants and animals like infestation of liana by red ants and hovering of a particular fly over *Tridax* species. An indigenous bio-cultural heritage surrounding plant resource utilization forms an inseparable part in the life of many

tribes in north east India². In coastal parts of Goa, fishermen use their fishing nets within their own assigned limits. During later monsoon period (*Sravana*) many societies in India avoid non-vegetarian food and hunting. To promote conservation, harvesting of certain plants in Himalayas is regulated. For example, a tuber (called *Nakhdur*) and flowers of a herb (*Brahmakamal*) in Uttarkashi are allowed to harvest only during particular religious festivals. In western Maharashtra certain nomadic castes (*Nandivallas*) hunts for wild animals in a pre-defined territory within forests. Similar is the case with another tribe in Bhandara district of Maharashtra regarding fresh water fishing. Another hunting tribe in Ahmednagar only hunt the adult Deers and let loose the fawns and pregnant. Many tribes bear ethno medicinal knowledge of plants for various ailments³⁻⁵. In an interesting case of community resource management in Chamoli district of Himachal Pradesh, only a single member from a family gathers fuel wood weekly. Some Pastoralists in western Maharashtra have their defined area for grazing, while in another interesting case it is observed that communities distribute among themselves, the extraction of narrow range of natural resources in which they are specialized in within a particular region, somewhat analogous to the concept of 'niche', resulting in sustainable livelihood of each group by specific natural resources.

Taboo

Taboo is a prohibition of doing certain things which is supposed to be against environment. It has developed simultaneously with our culture and tradition. It is intermingled with our living pattern and has such an easy acceptance by us that it is going on generation after generation without any hindrance and serving its purpose. There is a taboo on consumption of the 'ber' or 'boroi' (*Zizyphus jujuba* and *Z. oenoplia*). This fruit is prohibited in Bengal until the Saraswati festival is over on 5th day after dark moon day (late winter). The restriction is to ensure full ripening of the 'ber' fruits, which would enhance the chances of seed germination after consumption by humans. In Aravalli hills of western India, in a particular community, fuel wood collection from sacred groves is not allowed with the use of metal implements. The aboriginal taboos on extraction and use of the sacred species of plants and animals seem to have translated into Hindu religious restrictions on killing of certain life forms. The 'hanuman langur' (*Presbytes entellus*), and the 'Banyan' tree (*Ficus bengalensis*), for example, enjoy full religious protection from the entire Hindu society. 'Bishnoi' community in Rajasthan gives full protection to the 'khejri' tree (*Prosopis cineraria*) and the Black Buck. Strict ritual protection given to the 'khejri', a keystone species in the desert ecosystem providing food and fodder, has enabled both the black buck and the nomadic 'Bishnoi' people to survive the uncertainty of food availability. Hunting taboos on animals at critical life history stages – like pregnant deer - also ensured a sustainable growth. The taboo on fishing during the monsoon periods in Ganges waters is observed by traditional fisher folk, a taboo that ensured growth of populations of Anadromous fish like *Hilsa*

ilisha. Often there are taboos associated with the names of clans taken from plant names. Jain⁶ described clan names among the 'Sors' of Madhya Pradesh and the taboos against use of such plants. *Chheyolia* Clan (originated from *Chheola* plant – *Butea monosperma*) worships this plant and do not use it in any form. *Kentha* clan (From *Kaith* – *Feronia limonia*) worships the tree and do not eat its fruits. Santhal tribes of West Bengal beliefs some taboos like; prohibiting eating fruits of *Dillenia indica* before a religious ceremony in April and cutting trees of *Emblica officinalis* for tannin.

Ancient Scripts, Paintings, Sculptures

Ancient scripts, paintings, and sculptures consist of matters which predominantly revolve around the theme of conservation of our earth, water, soil, forests, and living creatures. These are emphasized through glorification, laws, and sayings. Scripts like *Manu-Samhita*, *Tantra*, *Kautilya Arthashashtra*, *Agni Purana*, are some works which bears instructions for conserving biodiversity and the man-environment relationships⁷. Some ancient texts such as *Aranyakas* and *Upanishad* '*Brhadaranyaka*' are especially important with respect to forestry and conservation⁸⁻¹⁰.

Indians from very early age were highly conscious about conservation and sustainability as evident from *Vedas* where at one instance it states in *Atharva Veda*¹¹ "O numerous coloured, firm and protected Earth! On this earth I stand, undefeated, unslain, unhurt."

Osadhisukta, one of the famous Suktas of Rigveda contains 23 hymns that praise the medicinal plants. In the Gita, *Krishna* compares the world to a tree; similarly *Ramayana* and *Mahabharata* has many such descriptions of people being under tree. There is a story of Jivaka who was directed to fetch plants that have no medicinal value. He failed in his mission which hints to the fact that all plants and trees are having some kind of medicinal value. In India animals are depicted as the vehicles of god which are mentioned in various paintings and sculpture. Sculptures, paintings and engravings of plants and animals emphatically express biodiversity and bio-resources of that particular region, and their dominance or rarity in different periods. *Manu Samhita* is an interesting literature with respect to environment and its conservation, for example mention is made about tank construction and list of plants to be planted on the embankments especially to conserve water resources. *Arthashastra* by Kautilya mentions about various forest officials to manage forest and regulate forest produce.

In *Veda* it is mentioned that there should be a composition of trees around each and every village¹² which is named differently as per their utilization and can be compared to the present day 'protected areas' and 'production forests'¹³. The *Varah Purana* glorifies Neem as among the plants which if planted by somebody do not go to hell. Neem today is recognised in India as the most useful traditional medicinal plants¹⁴.

Practices, Faiths, Myths, Beliefs

There are some practices prevalent in our societies which are in the form of either faith or belief or in the form of myths. Many communities consider certain plants and animals as totem and conserve them in any situation; for example *Mores* and *Ghorpades* in Maharashtra from peafowl and monitor lizard. In India, *Ganesha* is considered as a combination of elephant and man who is revered everywhere. Similarly the *Hanuman* is considered as a monkey god. In many places in India snakes are worshipped as guardians of the home and are thought to be a symbol of creativity and wisdom. Some attaches certain species to have originated from bodies of gods for example Lotus, *Acacia catechu*, and *Aegle marmalos*. *Ficus religiosa* (Peepal) is one of the most revered trees in our societies and is believed to be the abode of god and the tree is very rarely cut in India. In Kerala trees are allocated to individuals as per their birth dates and lunar asterism and are given full responsibility to take care of that tree.

The Parasnath hill along with Mt. Abu acts as bridge for migration of flora between Himalaya and South Indian Hills and has a phytogeographic significance. The former, in Bihar, is considered as sacred by Jain faith of non-injury. Similarly in *Kartikya* temples in Tamilnadu Peafowl is considered sacred and are conserved. Fishing is prohibited in the Ganges from Gangotri to Hardwar, as this stretch of the river is considered sacred. Similar stretches of other rivers like Mahanadi, Narmada and Godavari are also deemed sacred, where no fishing is permitted. These stretches serve as important refugia for fish in these rivers. In several Sufi shrines in Bengal, groves attached to the shrines are maintained and protected by the local Hindu and Muslim devotees.

Socioeconomic Practices

There are practices which relates directly with the socio-economy of the families, communities, and tribes. Rural and tribal population in India grows plants in their courtyards, which is often known as homegardens (in rural areas) and kitchen garden; for example in north east India, western Himalaya, western India, and in Peninsular India. These gardens provide a regular supply of fuel wood, and other important items such as fruits and vegetables. This tradition has resulted in conservation and survival of many original native plant types over centuries. The continuing patronage of many tribal and other traditional farmers, of favoured cultivars of crops is another major aspect of biodiversity.

Borthakur¹⁵ reported of traditionally preferred species for making indigenous weaving implements such as *Bambusa nutans*, *B. tulda*, *Dendrocalamus hamiltonii*, *Artocarpus integra*, *Dvsoxylon binectatiferum*, and *D. procerum*. It is known that during Emperor Ashoka's time planting of trees was mandatory in wasteland, along roads, within agricultural land, similar to the present day practice of Social forestry and

Agroforestry. Bartering of seeds is common among rural farmers in India and this did not depend on the cash economy. This practice preserved food and seed diversity for generations.

Cultural Practices

Some practices imbibed into our culture have been able to preserve the flora and fauna of the land. Trees and forest patches serve as landmarks for past and present events. Many widely used similes and metaphors are taken from plants and animals; *tall like palm*; *slow like a tortoise* and *clever like a fox*. A tribe in Rajasthan and Gujarat (*Garasias*) believe that the village headman and his wife are brother and sister-in-law respectively of *Salmalia* trees. Traditional water harvesting structure (pond) in rural India is considered an important habitat for a variety of species even if the pond size is small¹⁶. There are vernacular names associated with the names of species for example Turmeric- '*Shobhna*', *Helicteres isora*- '*Marorphali*', *Diplocyclus palmatus* - '*Shivlingi*', *Euphorbias*- '*Dudhi*'. These indicate towards the importance being given towards the respective plants. Similarly some proverbs too indicate traditional knowledge of plant properties- '*Karela neem chadha*', '*ek anar sau beemar*', and '*aam ke aam guthlion ke daam*'. An age old custom still prevails at the Temple of Lord Jagannath at Puri in Orissa; food offered to the Lord is cooked from freshly harvested rice every day, which indicates towards the large number of rice varieties which were available for whole year. In Karnataka and Andhra Pradesh, the *Ugadhi* festival signifies a test of selecting best grain varieties for next season through germination capacity which also indicates towards a cultural practice of selecting and sustaining the best crop in future.

Conclusion

The wide array of spectrum of measures which are mentioned forms the foundation of today's bio-wealth, we see around us. If we analyse these closely we could be able to appreciate that these are very much scientific and each of these correlates with the basic ecological principles. These includes appreciation of certain species in maintaining sensitive ecosystems, sustainable use of natural resources, ethnobotanical use of flora, Gaia hypothesis, appreciation of interconnectedness of organisms within ecosystems, afforestation programmes, water harvesting, inventorisation of flora, species interactions, distribution of resources, maintaining species' gene pool in ecosystems, sustainable use of forest products, reserves forests and water bodies, agroforestry, prohibition of complete harvest of plants, participatory forest management, and giving importance to certain key species of flora and fauna such as *Ficus* sp., *Mangifera* sp., *Terminalia* sp., *Madhuca* sp., Bamboo sp., *Presbytes* sp., Elephants, Camel, Horse, Tigers, Lions. Today's 'development' processes are gradually eroding these traditional systems interwoven within our communities and are posing great hazard to our precious biodiversity. Human beings are living on this earth from thousands and thousands of years

without hampering the natural processes. But it is from last century or so, since we are in a blind race of development, that our impact is adverse on our natural resources. It is the time that we appreciate the significance of these practices in maintaining sustainable growth which is already imbibed within our soul and body through various forms.

References

1. Jain S. K., Some Aspects of Biodiversity and Indian Traditions, *Indian Journal of History of Science*, **33(1)**, 51-62 (1998)
2. Sonowal R. and Barua I., Indigenous Knowledge and Bioresources Utilization among the Tai-Khamyangs of Assam, North East India, *International Research Journal of Biological Sciences*, **1 (7)**, 38-43 (2012)
3. Sainkhediya J. and Kumar A. D., Ethno Medicinal Plants used by Tribal Communities for the Treatment of Snakebite in West Nimar, MP, India, *International Research Journal of Biological Sciences*, **1 (2)**, 77-79 (2012)
4. Pepsi A., Ben C. P. and Jeeva S., Phytochemical Analysis of Four Traditionally Important Aquatic Species. *International Research Journal of Biological Sciences*, **1 (5)**, 66-69 (2012)
5. Bhalerao S.A. and Kelkar T.S., Traditional Medicinal Uses, Phytochemical Profile and Pharmacological Activities of *Cassia fistula* Linn, *International Research Journal of Biological Sciences*, **1 (5)**, 79-84 (2012)
6. Jain A., Clans of Sor Tribals of Madhya Pradesh and their role in conservation, *Ethnobotany*, **4(1, 2)**, 67-69 (1992)
7. Sensarma P., Conservation of biodiversity in Manu-Samhita, *Indian Journal of History of Science*, **33(4)**, 267-272 (1998)
8. Pande O. P., *Vaidik Sahitya aur Samskriti ka Swarup*, (In Hindi.) *Vishwa Prakashan*, A unit of Wilie Eastern, New Delhi, India, (1994)
9. Keith A. B., *The Aitareya Aranyaka*. (Edited from the Manuscripts with Introduction, Translation, Notes, Indexes, and an Appendix containing the portion hitherto unpublished of the *Sankhayana Aranyaka*) Eastern Book Linkers, Delhi, India, 389 (2005)
10. Witzel M., *Katha Aranyaka*, (Critical Edition with a Translation into German and an Introduction.) Harvard Oriental Series, Harvard Department of Sanskrit and Indian Studies. Harvard University Press, USA, 220 (2005)
11. Chand D. (Tr.), *The Atharvaveda*. (Sanskrit text with English translation.) South Asia Book, Columbia, Missouri, USA, 949 (1997)
12. Prime R., *Vedic Ecology: Practical Wisdom for Surviving the 21st Century*, Mandala Publishing Group, Novato, California, USA., 157 (2002)
13. Kumar B.M., Forestry in Ancient India: Some Literary Evidences on Productive and Protective Aspects, *Asian Agri-History*, **12(4)**, 299-306 (2008)
14. Imam H., Hussain A. and Ajj, A., Neem (*Azadirachta indica* A. Juss) – A Nature's Drugstore: An overview. *International Research Journal of Biological Sciences*, **1 (6)**, 76-79 (2012)
15. Borthakur S. K., Traditional Weaving Implements Among the Mikirs (The Karbis) of Assam, *Indian Mus. Bull.*, **11(2)**, 46-50 (1976)
16. Pandey D. N., A bountiful harvest of rainwater. *Science*, **293**, 1763-1763 (2001)