# An Introduction to Ancient Indian Knowledge Systems

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Sanskrit is the sine qua non of ancient Indian knowledge systems. It is the key for the treasure house of ancient Indian wisdom. Sanskrit itself is one of the earliest inventions of ancient scientific pursuits in the human world. In a so organized manner the physiognomic origin of speech sounds was well depicted in the ancient Indian texts on Sanskrit language even in Pre - Paninian Times.

The earliest traces of the concept of social living are well documented in Sanskrit. Since then Sanskrit has, through several millennia, been growing as the binding force of all the people of this Sub - Continent. From Kargil to Kanya Kumari and from Kamarupa to Saurastra, the whole India is one for every Indian because of his possessiveness for Sanskrit. The geographical descriptions available in ancient Sanskrit texts describe India as a single whole and never view it partly. This lofty idea of 'One Nation – One people' with regard to our country is as old as the Vedic tradition.

In the anatomic analysis of the linguistic body of India all the regional languages play the efficient role of various limbs. Each of the limbs should be strong, good and well structured enough for a healthy body. So also all the regional languages, which are the striking marks of Indian diversity, are strengthening the country from all sides. At the same time as the heart does purify the blood and pumps to all the limbs for their proper and efficient functioning Sanskrit supplies all the phonetic, morphological, semantic and syntactical elements and even the common and technical vocabulary to all the Indian languages irrespective of their Indo - European or Dravidian origin. This unifying nature of Sanskrit earned it a unique place among all the languages of our country. The sovereignty of linguistic India could be protected through Sanskrit and surely not through any other regional language.

One who systematically learns Sanskrit with commitment will imbibe all the noble qualities like Ahimsa (Non Violence), Karuna (Compassion) and Maitri (Friendliness). These assimilated qualities will ensure one to have an incomparable personality with an exemplary individuality.

Right from the Vedic times the Indian intellectuals are after the pursuit of establishing harmonious relation between the man and the Nature. They always

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advocate the mother and son relationship between the Nature and the man. The trees, the streams, the hill and dale, the sky and the earth, the oceans and rivers and every other thing in nature from pebble to peninsular is very much lively, divine and dynamic for our ancestors of Sanskrit culture.

As all the western languages are indebted to Greek, the spring fountain of the western scientific terminology, so are all the Indian regional languages even today owe much to Sanskrit to coin new scientific terms in India. So it is very much essential for every scientist and expert of technology to learn Sanskrit as a language and also as a source of many scientific disciplines of knowledge to prepare subject wise glossaries of universal acceptance in the country to spread the science and technology to the thresholds of all Indian villages in their regional languages.

Every country, while importing the foreign stocks of scientific and technological knowledge, never disowns its own ancestral - indigenous knowledge in the respective fields. But in India we disown our intellectual wealth and cling to a parasitic approach to import or dump western technology which those countries have left some decades back. Always we have been lagging behind even while adapting the western content.

**Sastra and Science are synonymous:-**

Here a little comparison may help to assess or evaluate the worth of our ancient Indian knowledge systems. Observation, hypothesis, experimentation, forming the principles through deduction and induction are if the essentials of science, the Sastras or various disciplines of knowledge in Sanskrit too possess the same essentials in the name of three means of acquiring knowledge viz. Pratyaksha (Direct Perception can otherwise be called Observation), Anumana (The process of hypothesis, deduction and induction methods of logic) and Sabda (Verbal testimony) which preserves all the principles of predecessors in text form. So the term Sastra can synonymously be used with the term 'science'.

Scientific method was as old as the human thought in this **land of letters**. Vedic literature was its main spring. Vedic seers were the first generation scientists. They adopted the method of observation, experimentation and deduction to produce the reliable phenomenal expatiation of various facets of knowledge. In this pioneering task they took the instrumental assistance too of a high technical value. Besides the three dimensions observation, experimentation and deduction the seers took the help of the fourth dimension **intuition** in producing such volumes of scientific literature.

Hence our ancient seers advanced a set of **means of Knowledge** to say in other words the **essentials for acquiring knowledge** correspondingly representing the basic constituents of science in the following manner.

| **Sl. No.** | **Means of Knowledge** | **Corresponding constituents of Modern Science** |
|---|---|---|
| 1. | Pratyaksha or Direct Perception | Observation |
| 2. | Direct Perception | Experimentation |
| 3. | Anumana or Inference | Deduction or Induction |
| 4. | Sabda or Verbal Testimony and Yogaja Pratyaksha (The intuitive perception) | Extra Sensual Perception |

**The Two Fold Streams of Sastras and the Big Data of Indian Knowledge:-**

All the Disciplines of Ancient Indian knowledge are divided into two streams as Injunctive Sciences and Mundane sciences adapting the methods of expansion of data, compression of data and encryption of data. While the Injunctive Sciences (The Vedas) regulate the human behavioral traits the Mundane sciences deal with the nature, scope and purpose of natural and physical world for the comfortable living of mankind. As a result the following disciplines through several millennia have been descended down to the modern world from the lineage of seers of India.

The huge volumes of Veda Samhitas, Brahmanas, Aranyakas, Upanishads, Srauta/ Grhya/Sulba Sutra Texts, Shadangas, Anukramanika Texts, Pratisakhyas, 500 Smriti Texts, Six Orthodox Systems of Philosophy, Two Itihasas – The Ramayana and The Mahabharata, 18 Puranas, Texts on 64 Fine Arts, Agama Texts dealing with standard architectural techniques, Specialized Lexicons (Kosa granthas) and Various Sastra Texts dealing with the living crafts of human societ are even today name wise and title wise are available. In these huge volumes of treatises lot of information is available pertaining to the modern areas of study such as Astronomy, Acoustics, Agriculture, Architecture, Botany (with rich etymological notes on thousands of herbal plants), Mathematics (with its branches of Arithmetic, Algebra, Trigonometry, Spherical Trigonometry, Binomial Theorem, Geometry) , Metallurgy, Hydrology, Medicine, Physiological Phonetics, Articulatory Phonetics, Meteorology, Seismology, Dietetics, Mineralogy, Geology, Environmental Science, Cosmetics, Chemistry, Physics, Animal Husbandry, Zoology, Cosmology, Psychology, Parapsychology, Moralogy and Management Studies. All these

knowledge sections can assure the modern world to lead a pollution free long life for hundred and plus years.

In the pursuit of tracing out the scientific contents in Sanskrit one has to first have an introduction to various literary types of existing in this perennial language. To broadly introduce the following are the major branches of various disciplines of knowledge available in Sanskrit. They are -

When compared to the modern scientific fields the contents of those ancient texts are of three types as knowledge areas which have no modern parallels, knowledge areas which have equal modern parallels and knowledge areas which seem lower to the available modern areas of similar kind.

**Branches of Sciences found in Sanskrit:-**

An observation helps to understand that the following branches of science are traceable in ancient Sanskrit literature.

**Physical and Chemical Sciences:-**

Nyaya and Vaiseshika systems give the earliest reference to the atoms of air, fire,water and earth. Nyaya Darsana gives some information about preparing lenses. Manusmriti, Matsya Purana, Ayurvedic and Rasatantra texts present the details of mensuration. Rasatantra Texts give an abundant information of various metals, chemicals and chemical processing. An interesting information of constructing a chemistry laboratory is available in all the famous Rasatantra Granthas.

**Natural Sciences:-**

The texts like Susruta Samhita, Amara kosa and Nirukta recorded the Indian system of Botanical Taxonomy. Susruta Samhita, Rgveda and Atharva Veda and various Pauranic Texts give a good amount of information with regard to the Medical Botany. In the texts on Vastu, some texts on Vrkshayurveda and some epic sources present a detailed account of Agriculture and Gardening methods. There is a reference to the sense perception of plants in the Mahabharata. The Ramayana, Smritis and some Vedic texts give vivid picture of the classification of the animals and make a deep study of their structure and the methods of curing diseases of different animals.

**Indian Mathematics:-**

Similarly in the field of Mathematics the process of counting numbers from one to Parartha in ten multiples is mentioned in Krshna Yajurveda, Ramayana, Brahmanda Purana and other texts. Lilavati is the text on Algebra. Suryasiddhanta deals with Trigonometry. Sulba Sutras of Apstambha and others present a detailed

study of Geometry for the purpose of structuring Sacrificial Altars. Halayudha's commentary on Pingala's Chandas furnishes a good information of Binary Arithmetic.

**Earth and Space Sciences:-**

Likewise in the text Brhat Samhita of Varahamihira we have a bulk of information with regard to the process of finding out underwater currents. Nearly two hundred methods are presented which can even today be put in practice. Seismology is another interesting subject available in the Brhat Samhita of Varahamihira. Brahma Siddhanta, Vasistha Siddnata, Surya Siddhanta, Paulisa Siddhanta and Romaka Siddhanta are the five famous Astronomical Works with wonderful content pertaining to the Planets, their positions, moments and their influence over the earth.Texts like Samarangana Sutradhara, Maya Vastu etc., stand as a concrete proof for the masterly knowledge of our ancient people in the field of Architecture.

**BRANCHES OF SANSKRIT SCIENCE**

| **Physics and Chemical Sciences** |
|---|
| * Nyaya and Vaiseshika Darsanas |
| * Manusmriti |
| * Matsya Purana |
| * Ayrvedic Texts |
| * Rasatantra Texts |

| **Natural Sciences** |
|---|
| * Botany (Indian Taxonomy) |
| * Medical Botany- Amarakosa |
| * Agriculture – Krishi Parasara |
| * Zoology – Smritis and Kosas |
| * Indian Medicine - Ayurveda |

| **Indian Mathematics** | |
|---|---|
| * Counting | - Krshna Yajurveda, Epics & Puranas |
| * Algebra | - Lilavati |
| * Trigonometry | - Suryasiddhanta |
| * Geometry | - Sulbasutras of Apastambha etc. |
| * Binary Arithmetic | - Halayudha's Commentary on Pingala's Chandas |

| **Earth and Space Sciences** | |
|---|---|
| * Geology | - Brhat Samhita etc. |
| * Gemology | - Ayurvedic Texts and Puranas, Rasa Tantras |
| * Seismology | - Brhat Samhita etc. |
| * Astronomy | - The Five Siddhantas |
| * Architecture | - Samarangana |

| **Humanities** |
|---|
| * Behavioral Sciences |
| * State Craft |
| * Human Management |
| * Trade & Commerce |
| * The art of Making Ornaments |

**Five fold sources of Scientific Literature in Sanskrit:-**

All the above sources of various disciplines of ancient Indian Knowledge systems are fivefold as: Vedic Literature, Pauranic Literature, Independent Treatises related to the said modern areas, Inter-disciplinary References and Classical Sanskrit Literature. Here is a set of illustrations related to Mathematics and Botany from the said five sources. For the rest of the branches also one can develop material from all these five streams.

| Sl. No | Source Works | Mathematics | Botany |
|---|---|---|---|
| 1. | Vedic Literature | Krshna Yjurveda<br>Atharva Veda<br>Satapatha Brahmana<br>Sulba Sutras | Rigveda<br>Taittiriya Samhita<br>Atharva Veda<br>Nirukta |
| 2. | Independent Treatises | Lilavathi | Vrukshayurveda<br>Sarangadhara Paddhati |
| 3. | Puranas and Itihasas | Ramayana, Mahabharata | Ramayana<br>Mahabharata<br>Agnipurana<br>Garudapurana<br>Matsya Purana |
| 4. | Kavya literature | Saundarya Lahari | Works of Bhasa,<br>Kalidasa<br>Bana and others |
| 5. | References in the Other disciplines | Pingala Chandas<br>Sangita Ratnakara<br>Vedanga Jyotisha<br>Other Astronomical works | Manusmriti<br>Ayurveda<br>Vastu<br>Amarakosa<br>Arthasastra<br>Jyotisha |

If the process of learning all these branches of knowledge and arts is revived and introduced in a novel way suitable to the modern times and to meet needs of our contemporary times it will be of high advantage and the pride of our nation also can be well protected.

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# Bhūmisūkta of Atharvaveda; vision of seers on Environment and Sustainable Development

Viroopaksha V. Jaddipal *

**Introduction:-**

**Environment and ecology:-**

The environmental science and ecology are relatively modern disciplines of scientific study under which environment and its constituents are studied with all microscopic precision. As scientific methodology requires, environmental science and ecology are firmly established in 20th century with experimentation based on cause and effect theory. But ample references as well as germination of environment related original ideas can be seen in the Vedic and ancient Sanskrit literature.

Long before ecology got its due emphasis at the hand of environmentalists, at global and UN level, the ancient thinkers had had already provided insightful thought to the generations on environmental ethos. It is said that the word 'ecology' is coined formed from the Greek word "Oikos", meaning 'home' and "logus" conveying knowledge; whereas the word "Oikos" has its root in Vedic word "Okas/ okaḥ[1]" which means "home" and in all such sense the word had been used in vedic texts.

In Indian subcontinent, for the first time, the British Government enacted the Forest Act, 1865, further revised it in 1878 and once again new Forest Policy of 1884 was formulated and finally the Forest Act of 1927 was enacted which contained all major provisions of the earlier Act, and British could acquire forestland, village forest and other "Common Property" resources through this act. In Independent India, the Environment (Protection) Act, 1986 has been very comprehensively drafted and included various salient features of the British Act 1927; but evidently absent even in the preamble to mention the vision of our Seers. The Act of 1986 defines the environment thus: 'Environment includes water, air and land and the inter-relationship which exists among and between water, air and land and human beings, other living creatures, plants, micro organisms and property[2]. From the above legally valid definition, it can be gleaned that that environment consists of two components namely living organisms and non-living factors. The living organisms can be divided into three groups - those living mainly on land, in water and in air. The non-living materials of the environment are land, air, water, property etc.

* Secratary, Mharshi Sandipani Veda Vidya Pratishthan, Ujjain