CHAPTER 2: ECOLOGICAL BALANCE ACCORDING TO ANCIENT SCRIPTURES

2.1. INTRODUCTION

Human beings are an integral part of the ecosystems. But, we have exploited the environment with our indiscriminate use of natural resources. The ecological balance of the mother earth has been disrupted by negligent human activities. Eventually, overexploiting the ecosystems will result in an uninhabitable planet and an acute threat to human survival. We shall briefly look into how this balance is advocated in our ancient scriptures and ways to correct human actions to restore the balance.

The environment is now inundated with electromagnetic pollution. Use of cellular phones, cooking with microwave energy, radar for commercial and military applications are some of the uses of electromagnetic energy at home and in the industry. The adverse impact of these activities continues to be evident. While direct solutions are not available in our scriptures, some of the methods of practices in Yoga and Ayurvada could help us in overcoming the negative effects of these radiations. The second part of the thesis deals with these problems and suggests some solutions based on research carried out in this area. In the following chapters of Part I, we present the scriptural text that deals specifically with balances in nature and recommends awareness and actions to maintain that balance.

The importance of environmental integrity and negative impact of human activity are not new in the Indian context. These ideas can be traced back to 300 B.C.E. The principles of environmental protection are found in Arthashastra authored by Kautilya, the prime minister of the Magadha dynasty during the period of Chandra Gupta Maurya. Arthashastra deals with environment and lays down rules from all angles in great detail. The ancient Indian literature was browsed and verses cognate to environment were identified and interpreted in the light of the modern day requisites of environmental sustainability to establish the required pertinence (direct or indirect). Vedanta is one such ancient literature. The Vedic literature referenced to in this paper includes the four Vedas (Rg, Yajur, Sama and Atharva),

Upanishads, Mahabharata, and Puranas. The erudition of Vedas is towards understanding the relation between Atman (Individual Self) and Brahman (Macrocosmic Self) and to unite Atman with Brahman. Upanishads avail us to understand the authenticity of Atman by detaching Maya, the materialist world and to reunite with Brahman. Bhagvad Gita is a discourse given to Arjun during Mahabharata. It describes Karma, Jnana, and Bhakti Yogas and notions of three Gunas (Satoguna, Rajoguna and Tamoguna) which have a consequential relationship with ethical and moral disposition of a person. Arthshastra was written around 4th century BCE by Kautilya. The book has about 6000 hymns and is a comprehensive manual regarding administering a state by a king and his administrators. Indian philosophy of Panch Mahabhutas explicates that the Five Great Elements - Earth, Water, Fire (Energy), Air and Space are interconnected, interdependent and form the web of life. The Upanishads expounds the interdependence of these elements to Brahman, the supreme authenticity, from which they arise: "From Brahman arises space, from space arises air, from air arises fire, from fire arises water and from water arises earth". These elements are part of the environment and Indian sages have established a relationship between these five elements (Panch Mahabhutas) and five sensory organs. The human nasal discerner is cognate to earth, tongue to water, ocular perceivers to fire, skin to air and auditory perceivers to space. The relationship establishes the fact that people need to give the elements the same consequentiality as they give to their sensory organs. These Five Mahabhutas are cosmic elements which engender, nurture and sustain all forms of life, and upon decay they absorb what was engendered earlier. Thus they play a paramount role in preserving and sustaining the environment. Vedantic scriptures see divinity in everything around us such as the Sun, Moon, Mountains, Rivers, Land, Sea, Birds Animals, Air, and so on. All are engenderments of the Almighty and have His presence and impression. No one can take liberty of harming, exploiting and misusing any of the God's engenderment. Bhagwad Gita reiterates that the

whole of the Macrocosm is His engenderment. Each and everything of this macrocosm has his presence and ultimately it will merge in Him. "Earth, water, fire, air, aether, mind, perspicacity and egoism—thus is My Nature divided eightfold (Bhagwad Gita 7.4)"

भूमिरापोऽनलोवायुः खंमनो बुद्धिरेव च ।

अहंकार इतीयंमे भिन्ना प्रकृतिरष्टधा ॥७-४ ॥

bhūmirāpo'nalovāyuḥkhaṁmano buddhireva ca ।

ahaṁkāraitīyaṁme bhinnāprakṛtiraṣṭadhā ।।7-4

Know that these two (My higher and lower Natures) are the womb of all beings. So, I am the source and dissolution of the whole universe.

एतद्योनीनिभूतानिसर्वाणीत्युपधारय ।

अहंकृत्स्नस्यजगतःप्रभवः प्रलयस्तथा ॥७-६ ॥

etadyonīnibhūtānisarvāṇītyupadhāraya ।

ahaṁkṛtsnasyajagataḥprabhavaḥpralayastathā ।।7-6 ।।

"Both these are the womb (source) of all beings, understand this. I am the source as well as the dissolution of the entire universe (Bhagwad Gita 7.6)." Further:

यथाकाशस्थितो नित्यम् वायुःसर्वत्रगोमहान् ।

तथासर्वाणि भूतानिमत्स्थानीत्युपधारय ॥ ९-६ ॥

yathākāśasthito nityam vāyuḥ sarvatrago mahān ।

tathāsarvāṇibhūtānimatsthānītyupadhāraya ।।9- 6 ।।

"Just like the mighty wind travels everywhere, established in space, so too, all beings reside in Me, understand this (Bhagwad Gita 9.6). Animating My nature, I again and again send forth all this multitude of beings, helplessly driven by the force of their own nature. Commanding My Prakriti, I repeatedly project this entire world of beings, which is helpless under the control of Prakriti."

प्रकृतिंस्वामवष्टभ्यविसृजामि पुनः पुनः।

भूतग्राममिमंकृत्स्नमवशंप्रकृतेर्वशात्॥ ९-८॥

prakṛtiṁsvāmavaṣṭabhyavisṛjāmipunaḥpunaḥ।

bhūtagrāmamimaṁkṛtsnamavaśaṁprakṛtervaśāt ।। 9-8 ।।

(Bhagwad Gita 9.8)

Since God is omnipresent, Yajurveda (16.34) says, "Homage to him in woods and to him in bushes, homage to him as sound and to him as echo" and if we intend to do good *Karmas* to attain good results, we should respect all creatures on this earth. We should evaluate our actions to be in harmony with the nature and not to endanger in any way the future generation on this planet. Protecting the environment is a part of Hindu dharma and there are many rural communities like Bishnoi and Swadhyaya who still protect and conserve the environment not in the capacity of "environmentalists" but to fulfill their dharma. Earth (*Prithvi*) has been given great importance in the Vedic Literature and is called *Mother Earth: "Mata Bhumih Putroham Prithivyah*: Earth is my mother, I am her son."

In Atharvaveda, one hymn, Boomi-Sukta, having 63 verses is devoted to the earth (Atharva Veda 12.1). It declares that earth is not for humans alone but for other creatures as well and wishes to have harmony between all those living on earth. Water (Jala) is considered as a

powerful medium for purification and source of energy and is hence used in rituals. There are many verses written on water which show its importance in our lives. "Waters which come from heaven or those that wander, dug from the earth, or flowing free by nature, bright, purifying, speeding to the Ocean, here let those Waters [not clear]. Goddesses, protect me (The Rigveda07.49.2)". "Blessed be the streams from hills of snow, sweet be spring Waters unto thee; sweet be swift running Waters, sweet to thee be Water of the Rains. Sweet unto thee be Waters of the waste and Waters of the pool; Sweet be the Waters dug from earth, to thee, and Waters brought in jars. (Atharvaveda 19.2.1-2)". But, today, the large scale industrialization and urbanization has resulted in unmindful release of industrial toxins into the water bodies which is causing severe health hazards and great harm to aquatic life. Further, declining ground water levels and unpotable drinking water is ringing alarm bells in several parts of the world. The grave situation compels us to review our actions and safeguard the environment. Air (vayu), according to Brahadaranyaka Upanishad, is the bond and thread which keeps the universe together. Vayu is also prana (life sustaining breath) and without prana nothing survives.

When around 200 BCE, Charaka wrote regarding Vikrti (pollution) and diseases, he mentioned air and water pollution specifically as causes for many diseases. However, presently, due to unrestricted industrial growth, air is polluted to a great extent. There have been reports of acid rains in many areas around the world. Respiratory diseases are on the rise in urban areas and now it has started affecting the rural habitations too. Trees (Vriksha) and certain other plants are considered sacred and are worshiped regularly. Planting of trees has been considererd a religious activity. In Rigveda, the trees are regarded to have divine powers due to their medicinal properties. A full hymn (Rigveda 10.97) having 23 verses is devoted in their praise. 'Tear not up by the roots the Kakambira tree: destroy thou all malignity' says the Veda (Rigveda 06.48.17). Further, in Charak Samhita, it is stated that

the destruction of the forest is equivalent to destruction of the state and conversely reforestation is an act of rebuilding the state and advancing its welfare. In Mahabharata, there are various verses advising protection of trees and forests. At one instance, Bhishm Pitamaha says to Yudhistira, "Let not such trees as yield edible fruits be cut down in thy dominions" (Mahabharata, Shanti Parva, Sec 89, P 194). Hindu philosophy puts great importance on environmental sustainability since they realized that for a balanced growth of humanity, environmental protection is of paramount importance and maintained that people polluting the environment would be cursed. Accordingly, a code of conduct (Dharma) was framed to define the ethical relationship with environment. "A person, who is engaged in killing creatures, polluting wells, and ponds and tanks, and destroying gardens, certainly goes to hell". To conserve the environment, Rigveda warns against polluting space and air, advising to be in harmony with the environment and letting forests grow as much as possible. "Graze not the sky. Harm not mid-air. Be in accordance with the earth. For this well-sharpened axe hath led thee forth to great felicity. Hence, with a hundred branches, God, Lord of the Forest, grow thou up. May we grow spreading with a hundred branches" (Rigveda 5.43).

In the past, it was everyone's duty to maintain proper sanitation and punishments were set for default. As Kautilya wrote, "The punishment of one-eighth of pana should be awarded to those who throw dirt on the road. For muddy water, one-fourth pana, if both are thrown, the punishment should be doubled. If defecation is done near temple, well or pond, sacred place, or government building, the punishment should increase gradually, one pana in each case. For urination, the punishment should be only half". (Kautilya's Arthasastra, Book II, Ch. 36, Verse 145). On the co-existence of humans and their environment, Brhadaranyaka Upanisad observered: "In so far as beasts and birds, even to the ants found living in his house, he becomes their world. Verily, as one wishes non-injury for his own world, so all beings wish non-injury for him who has this knowledge. This, indeed, is known and well investigated."

(Brhadaranyaka Upanisad 1.4.16, as cited by Nelson 1998, p. 52). The Ancient scripture, Chandogya Upanishad has explained the inter-relationship and co-relation between human beings and environment. The ancient Mahatmas and Rishis have revealed that "God sleeps in minerals, wakes in animals and thinks in man" (Arthur Young, 1804) .

2.2.Concept of *Ecology* according to Rgveda

The Vedas encapsulate all streams of knowledge, both material and spiritual. According to Manusmruti, Vedas are the ultimate source of all knowledge. The Vedic views revolve around the concept of nature and life. Rg Veda, the oldest of the vedas, presents the noble concept of man-nature relationship in the universe. The hymns of Rg Veda suggest that there is a single essence that forms the basis of existence and animates all living creatures in the universe. It is deeply rooted in the Indian philosophical concept of Monism (*Advaitha).* Nobody thought of an existence independent of nature, which forms the basis of man's existence. So, safeguarding nature and gracefully receiving whatever it offers becomes man's supreme duty..According to our ancient tradition and literature, Nature has been viewed as the manifestation of God and worshipped with the same reverence.. Man and nature were in perfect harmony, enjoying the abundance and the bliss of the supreme. According to the Vedic Tradition, human existence is in the domain of nature and is constantly influenced and regulated by its power and compassion. In majority of the Vedic hymns, deities as personifications of nature are invoked. Rg Veda refers mainly to the Sun God (*Savithar*) the source of energy; Water (*Varuna*) the god of water and other gods like *Ushas, Yama, Rudra, Puusha, and Agni* also were viewed as the manifestations of gods. In the incipient golden era, the spiritual vision, thoughts and actions of mankind were not contaminated by corruption of any kind. Man and nature were in perfect harmony, enjoying the abundance and the bliss of the supreme. Human beings have always prayed for the blessings and abundance of harvest and prosperity. The Vedas exhort everyone in the society to possess a vocation and to work

not only for livelihood but also to achieve noble ends. *Ushas*, the Goddess of Dawn, is associated with men's active life. The last chapters of *Isavasya Upanishad of Shukla Yajurveda* explain that all the micro and macro-materials in the universe are preserved by the spirit of God. This cosmos itself is God. All the living and inanimate objects are the manifestations of God. The earth forms the limbs of God, atmosphere is the abdomen, sky is the head, sun and moon are the eyes and the four corners are the years (is this ears?). Universe and Physical mass are the two stages (phases) of the Almighty. That means, all the organic and non-organic substances in the universe are the manifestations of God. Worship them, live with them, because these two are one and the same. This unique spiritual relation of man and nature is the core concept of Indian theology.

The divine Vedic hymns came into being through worshipping nature. Man also has a sense of humble dependence on nature. The Vedic hymns give the best illustrations of ecocentrism. His duty is to protect Nature and to accept what nature offers (Rehabilitation, 2013). Hindu philosophy puts great importance on environmental sustainability since they realized that for a balanced growth of humanity, protection of our environment is important and said that people polluting the environment were cursed. [Repaat]. May we grow spreading with a hundred branches (Rgveda 5.43) the co-existence of all is necessary for mutual benefit and unnecessary exploitation of any of these is prohibited. No one can take liberty of harming, exploiting and misusing any of the God's creation(Baranwal, n.d.).

2.3. Ancient Definition of Ecology: Introspection into Bhagwad Gita

In the post Vedic period, Manu is the pioneer to establish the importance of ecological niche. Manu has used the words "*Pruthak Sansthaascha nirrmamay*" [different (living) conditions for different created beings]. *Manusmruti* 1/21 refers to the ecosystem of modern ecology. In *Manusmruti*, many more noteworthy ecological aspects are available such as ecological factors, hydrological cycle, ecological niche, food chain, concept of ecological indicator,

consciousness for pollution and contamination and the scientific basis to conserve biodiversity. Above all, the formulation of environmental laws by Manu is very significant. The other Sanskrit epics such as *Vrikshaayurveda* (by Sarangadhar), *Vrikshaayurveda* (by Parasara, 250-120 B.C), *Brihataaranyaka Upanishad*, *Brihat Samhitaa* (by Varaha Mihir, 500 A.D), *Upasakra* (by Shankar Mishra), *Suddarssana Samuchaya*, *Kiranaavali* (by Uddayana), *Charak Samhitaa* (by Charak), *Sussruta Samhitaa* (by Sussruta) and *Arthas saastra* (by Koutalya) along with the Vedas record many ecological concepts and various aspects of biological science realized by the ancient seers which support their scientific attainments. In the present context, an attempt is made to explore the principles of ecosystem revealed by Lord Sri Krishna in *Bhagawat Gita*, in continuation to the previous work and the methods of study are as reported earlier. The discourse in the *Gita* reveals many aspects of ecology which are amenable to modern science. The ancient Indian thoughts deal with ecological factors, energy flow in ecosystem, nature's hydrological cycle, ecological niche and socio-ecological pyramids (Padhy, 2015).

2.4.Various Ecological factors

Modern environmental science has broadly classified the ecological factors into two categories: abiotic and biotic. The abiotic factors are again divided into three: 1. Climatic factors (light, temperature, rainfall, humidity and atmospheric gases), 2. Topographic or physiographic factors (altitude, direction of mountains, steepness and exposure of slopes related to the physical geography of the earth) and 3. Edaphic factors (deal with soil formation, its physical and chemical properties). The biotic factors include all kinds of interactions between the different forms of life, that is, plants, animals and microorganisms. In a natural condition, the life of an organism is affected by the sum total of all ecological factors and not just by any individual factor. From physical point of view, the body of an

organism and its activities are a combination and interaction of different elements of the environment. There is an interrelationship between an organism and its physical environment. The physical environment influences the life of an organism and vice versa. This reciprocal interaction between the organism and the environment is responsible for the development, evolution and expansion of biodiversity on this earth. In the seventh chapter of *Gita*, Sri Krishna says:

भूमिरापोऽनलोवायुः खंमनो बुद्धिरेव च।

अहंकार इतीयंमे भिन्ना प्रकृतिरष्टधा ॥७-४॥

bhūmirāpo'nalovāyuḥkhaṁmano buddhireva ca।

ahaṅkāraitīyaṁme bhinnāprakṛtiraṣṭadhā ।।7-4

"Earth, water, fire, wind and space, along with mind, ego and intellect constitute my eight-fold differentiated nature.

अपरेयमितस्त्वन्यांप्रकृतिंविद्धि मे पराम्।

जीवभूतांमहाबाहोययेदंधार्यते जगत्॥ ५॥

apareyamitastvanyāṁprakṛtiṁviddhi me parām।

jīvabhūtām mahābāho yayedaṁ dhāryate jagat ।। 5 ।।

But, know this lower (nature as) different from my life-giving higher nature, O mighty-armed, by which this universe is upheld."

Division of the *Prakriti* (Nature) into *Paraa* (living) and *Aparaa* (non-living) is the first reference of the ancient ecological knowledge in theGita. Out of the eight

elements of *Aparaa Prakriti*, the first five are Earth (*Kshiti*), Water (*Aapa*), Fire (*Tejas*), Air (*Vaayu*) and Aether (*Aakaasa*), also called the *Pancha mahaabhoota*. A basic thought of the ancient Indians on environmental science is reflected in modern ecological factors such as (1) climatic (2) physiographic and (3) edaphic. These are nothing but the different modifications of the *Mahaabhootas* including the principle of vacuity which is crucial in the ancient knowledge of *Mahaabhootas.* Though space and time are the two great concepts in Einstein's theory of relativity in an increasing order of tangibility (that is, *Aakaasa-Vaayu-Tejas-Aapa-Kshiti*), they are not emphasized as ecological factors in modern science. However, ancient Indians were pioneers in the comprehension and scientific perception of ecological factors designated as *Mahaa bhootas. The Vedic view on two Mahaa bhotas, Tejas and Aapa* and the latter three factors of *Aparaa Prakriti* are mind (*Maanas*), intellect (*Buddhi*) and ego *Ahamkaara*) are of interest here. The last three are more metaphysical than physical in their existence. In the absence of *Paraa Prakriti* (life), these three behave as if they do not exist. The five abstract knowing senses are *Jnaanendriyas: Srotra*-power to hear, *Twak*- power to feel, *Chakshu*-power to see, *Rasana*- power to taste and *Ghraana*- power to smell. And the five abstract working senses are *Karmendriyas: Vaak*-power to express, *Upastha*-power to procreate, *Paayu*-power to excrete, *Paani*-power to grasp and *Paada*-power to move. *Maanas* is instrumental in letting the thoughts enter the subjects and constantly vacillating between objects. *Buddhi* is the seat of intelligence or the initiating capacity of the individual. It is the capacity of determination as well as the basis for knowing, willing, feeling and resolving. It is analytic in nature. *Ahamkaara* is a self-conscious principle. It relates to all experiences that could be had through the mind and intelligence. *Chitta* is defined as the organized totality of conscious experience. *Chitta* is the great environmental

factor that plays an essential role in human ecology. *Maanas* perceives and presents, *Ahamkaara* arrogates and *Buddhi* discriminates, decides and resolves which finally leads to the rise of an action (*Karma*). The mental vibrations indulge someone to execute a *Karma* (resultant action); an ecological basis of performance of right or wrong. These three environmental factors are analyzed very minutely by ancient Indians, which are not accepted and associated as ecological factors in the modern science. Sri Krishna tells Arjuna, "Know that all beings have evolved from this twofold Prakriti (*Paraa* and *Aparaa*), and that I am the source of the entire creation, and into me again they disappear (7/ 6)".

एतद्योनीनिभूतानिसर्वाणीत्युपधारय ।

अहंकृत्स्नस्यजगतःप्रभवः प्रलयस्तथा ॥७-६ ॥

etadyonīnibhūtānisarvāṇītyupadhāraya ।

ahaṁkṛtsnasyajagataḥprabhavaḥpralayastathā ।।7-6 ।।

"Both these are the wombs of all beings, understand this. I am the source as well as the dissolution of the entire universe."

This rightly reflects on the interactions between the organism and the environment of modern ecology (Padhy, 2015).

2.5. Ecological cycles according to ancient texts

The sun is the source of energy for our solar system. The radiant energy from the sun is released in the form of electromagnetic waves due to transformation of hydrogen to helium. Out of the total solar radiation, 1/50 millionth fraction reaches the earth's atmosphere every minute. About 34% of this energy is reflected back and 10% held by Ozone layer, water

vapour and other atmospheric gases. The rest 56% reaches the earth's surface, out of which 1 to 5% is used by green plants for photosynthesis and the rest is absorbed as heat by ground vegetation and water. Lord Sri Krishna elaborates the importance of Sun as the source of energy in theGita in different *Slokas* (7/8; 9/19; 10/21; 13/33; 15/12).

रसोऽहमप्सुकौन्तेयप्रभास्मिशशिसूर्ययोः।

प्रणवःसर्ववेदेशुशब्दःखेपौरुषंनृषु ॥ ७-८ ॥

raso'hamapsukaunteyaprabhāsmiśaśisūryayoḥ।

praṇavaḥ sarvavedeśu śabdaḥ khe pauruṣam nṛṣu || 7-8 ||

I am the taste in water, O Kaunteya. I am the light of the sun and moon, Om in all the Vedas, sound in space, valour in men.

आदित्यानामहं विष्णुर्ज्योतिषांरविरंशुमान्।

मरीर्चिमरुतामस्मि नक्षत्राणामहंशशी ॥ १०-२१ ॥

ādityānāmahaṁviṣṇurjyotiṣāṁraviraṁśumān।

marīcirmarutāmasminakṣatrāṇāmahaṁśaśī ||10- 21 ||

"Among the *Aadityaas* I am Vishnu, among the bright objects I am the radiant sun, among the *Marutas* I am *Mareechi*, among the stars I am the moon."

यथाप्रकाशयत्येकःकृत्स्नंलोकमिमंरविः।

क्षेत्रं क्षेत्रीतथाकृत्स्नंप्रकाशयतिभारत ॥ १३-३३ ॥

yathāprakāśayatyekaḥkṛtsnaṁlokamimaṁraviḥ ।

kṣetraṁkṣetrītathākṛtsnaṁprakāśayatibhārata ।। 13-33 ।।

"Just as the one sun illumines the entire world, so does the knower of the field illumines the entire field, O Bhaarata."

In the 15th chapter, He says:

यदादित्यगतंतेजोजगद्भासयतेऽखिलम् ।

यच्चन्द्रमसि यच्चाग्नौ तत्तेजोविद्धिमामकम् ॥ १५-१२ ॥

yadādityagatamtejojagadbhāsayate'khilam ।

yaccandramasiyaccāgnautattejoviddhimāmakam ।। 15-12 ।।

"That splendor which resides in the sun and illumines the entire world, that which is in the moon and in fire, know that splendor to be mine." Further,

गामाविश्य च भूतानिधारयाम्यहमोजसा ।

पुष्णामि चौषधीःसर्वाःसोमोभूत्वा रसात्मकः ॥ १५-१३ ॥

gāmāviśyacabhūtānidhārayāmyahamojasā ।

puṣṇāmicauṣadhīḥsarvāḥsomobhūtvā rasātmakaḥ ।। 15-13 ।।

"Entering the earth, I sustain all beings with my energy, and having become the nectar-giving Soma, I nourish all vegetation."

When light energy falls on the green surface of plants, a part of it is transformed through photosynthesis into chemical energy, which is stored in various organic products of the plants. Plants are the primary producers and form the first trophic level in an ecosystem. The

movement of water in an ecosystem is fundamental to understand the nutrient cycle of nature. Nearly 30 to 40 elements are required for the proper growth and development of living organisms. They are macronutrients (N, P, K, Ca, Mg, S, etc.) and Micronutrients (Cu, Zn, Mn, Fe, Bo, Mo, Co, etc.) which flow from abiotic sources to biotic components and back to the non-living systems in a more or less cyclic manner. These are known as bio-geo-chemical cycles, which constantly help the different elements to be reused. In addition to hydrological cycle, the gaseous cycles (oxygen cycle, carbon cycle, nitrogen cycle) and sedimentary cycles (phosphorous cycle, sulphur cycle and similar cycles for other elements) run in the nature. As the 'flywheel' in a machinery network controls the movement of other wheels, the hydrological cycle controls the movement of other biogeochemical cycles.

In the Gita the importance of the hydrological cycle is elaborated as follows:

अन्नाद्भवन्तिभूतानिपर्जन्यादन्नसंभवः।

यज्ञाद्भवतिपर्जन्यो यज्ञःकर्मसमुद्भवह ॥ ३-१४ ॥

annādbhavantibhūtāniparjanyādannasambhavaḥ।

yajñādbhavatiparjanyoyajñaḥkarmasamudbhavaha ।। 3-14 ।।

"From food are all beings created, from rain food is created. Yajna gives birth to rain, and rain is born out of action." It is rightly mentioned by Lord Sri Krishna that sacrifice is rooted in prescribed action and from sacrifice rain comes (along with other bio-geochemical cycles) which causes the production of food and sustenance of life on the earth. Sri Krishna again says:

तपाम्यहमहंवर्षंनिगृह्णाम्युत्सृजामि च।

अमृतंचैवमृत्युश्चसदसच्चाहमर्जुन ॥९-१९॥

tapāmyahamahaṁvarṣaṁnigṛhṇāmyutsṛjāmica ।

amṛtaṁcaivamṛtyuścasadasaccāhamarjuna ।। *9-19* ।।

"I provide heat, I hold back and send forth the rain. I am immortality and also death, I am real and also unreal, O Arjuna."

In the above *sloka*, Sri Krishna has added the birth and death cycles of beings, an additional cycle (not realized by modern science) to the biogeochemical cycles of nature. The statement "He is the being and non-being" scientifically indicates the coordinated relationship between the biotic and abiotic components of an ecosystem through the hydrological and biogeochemical cycles as mentioned in 3:14 above.

It is rightly mentioned by Lord Sri Krishna that sacrifice is rooted in prescribed action and from sacrifice rain comes (along with other bio-geochemical cycles) which causes the production of food and sustenance of life on the earth. (repeated)

2.6.Causes of imbalance in the Ecosystem

Ecological niche refers to the ecological address of an organism. The dictionary meaning of niche is a place, employment and activity for which a person is best fitted. Ecological niche is a more inclusive term that involves: 1. Physical space occupied by an organism, 2. Its functional role in the community and 3. Its position in environmental gradients of temperature, moisture, pH, soil and other conditions of existence. The idea of niche was first projected in *Manu smruti,* which says: "In the beginning He (God) assigned several names, actions and conditions to all created beings according to the words of the Veda (Manu 1/21)." In *Gita, Bhagawan* Sri Krishna has explained about the niche with a different approach while explaining the components of *Karma* (action). Accordingly, five factors are necessary to accomplish all actions.

पञ्चैतानि महाबाहो कारणानि निबोध मे।

सांख्ये कृतान्ते प्रोक्तानि सिद्धये सर्वकर्मणाम्॥ १८-१३।

pañcaitāni mahābāho kāraṇāni nibodha me।

sāṅkhye kṛtānte proktāni siddhaye sarvakarmaṇām ।। 18-13।

"Learn these five factors for the accomplishment of all actions, O mighty armed, which are spoken of in the *Saankhya* Philosophy in which actions culminate." The following are the factors operating towards the accomplishment of actions, viz. the seat of action (*Adhisthaanam*) and the agent (*Kartaa*), the organs of different kinds (*Karanam*), the separate movements of divergent types (*Chestaah*)*;* and destiny (*Daivam*)

अधिष्ठानंतथाकर्ताकरणं च पृथग्विधम्।

विविधाश्चपृथक्चेष्टादैवंचैवात्रपञ्चमम्॥ १८-१४।

adhiṣṭhānamtathākartākaraṇaṁcapṛthagvidham।

vividhāśca pṛthak ceṣṭā daivaṁ caivātra pañcamam ।। 18-14।

"The foundation, the doer and several instruments, and the various movements of several types, as well as the divinity, the fifth in these."

शरीरवाङ्ग्मनोभिर्यत्कर्मप्रारभते नरः।

न्याय्यंवाविपरीतंवापञ्चैतेतस्य हेतवः॥ १८-१५॥

śarīravāṅgmanobhir yat karma prārabhate naraḥ।

nyāyyaṁvāviparītaṁvāpañcaitetasya hetavaḥ ।। 18-15 ।।

"Whatever action a man performs with his body, speech or mind, whether right or wrong- these five (factors) are its causes." For an ecobalance, these five factors should be in balance and without conflict. The way to achieve this is discussed below.

2.7 Concept of Pancha Yajnya (five sacrifices) for ecological balance

The basic theme of sacrifice is conceptualised as *Pancha Yajnya* in *Manusmruti*, to express one's obligation for preserving one's own environment. Gita further elaborates that, for sacrifice, one should act through selfless motive (*Nrru Yajnya*), following the foot prints of one's ancestors (*Pitru Yajnya*), who had achieved perfection through sacrifice. The skill for selfless work is to be learned from Vedas (source of knowledge - *Rushi Yajnya*) and to be implemented in practical life as well as in fostering nature (ecological powers - Gods - *Deva Yajnya*); in return rain is bestowed (by gods) as gift that produces food for sustenance of life and for proliferation of biodiversity. Man is identified as an integral part of biosphere who has a moral responsibility for the protection of all living beings (*Bhoota Yajnya*) (Padhy, 2008). Yoga is the practical science of realisation, its philosophical basis is *Saamkhya Darssan*; the latter is the study of the principles of cosmic evolution by rational analysis. A yogi controls his/her breath, the life force (*Bhoota Yajnya* -Sacrifice for biosphere); diverts his vital sex energy into a super form, the *Oojas* (*Pitru Yajnya* - sacrifice for the secured flow of genetic system); activates the vortexes (power points) that exists within the spinal column (*Deva Yajnya* – sacrifice for different environmental powers) and finally attains the supreme knowledge of self realisation (*Rushi Yajnya* – sacrifice for the source of knowledge). All these are possible in a human body if practiced with self regulation (*Nru Yajnya* - sacrifice for humanity), for the upliftment of the self and all those concerned. This enables the yogi to offer his sacrifices automatically being indifferent and unattached; thus he honors his environmental responsibility through *Pancha Yajnya*, the highest ecological philosophy of ancient Indians as depicted in *Manu smruti* (Padhy, 2011).

The sacrifice ‘yajnya’ is regarded as an important concept of vedic philosophy and religion but when we study it in its broader sense, it seems to be a part of vedic environmental science. Yajurveda and Rgveda describe it as the ‘navel’ (nucleus) of the whole world. It hints that yajna is regarded as a source of nourishment and life of the world, just as navel is to the child. Yajnas signify the theory of give and take. The sacrifice simply has three aspects: dravya (material), devata (deity) and Dana (giving) (Padhy, 2013). The performance of *yajnya* has a predominant idea on a ritual oriented activity with worshiping different gods and goddesses along with chanting of *mantra* and *havan* (fire worship). In a wider sense, *yajnya* means any systematic sacrifice accomplished for common interest (universal) with a selfless motive. In the present society, the following *yajnyas* are usually performed such as: *ghruta yajnya* (worshiping gods with addition of clarified butter to fire), *anna yajnya* (feeding the needy), *naama yajnya* (chanting of the sweet name of god accomplished with music), *japa yajnya* (silent mental recitation of any *mantra*, up to a specific number) and *jnyaana yajnya* (discourse on a specific philosophical subject).Out of the above, *ghruta yajnya* involves vedic rituals; *anna yajnya* has direct involvement of common man; *naama yajnya* meant to purify the vibration of the atmosphere; *jnyaana yajnya* is performed by the elite for the development of self-consciousness and *japa yajnya* is based on a single person’s devotion to enhance the concentration of the mind. The last one is praised in Gita (*10:* 25) as the best of all the sacrifices.

महर्षीणांभृगुरहंगिरामस्म्येकमक्षरम्।

यज्ञानांजपयज्ञोऽस्मिस्थावराणांहिमालयः ॥ १०-२५ ॥

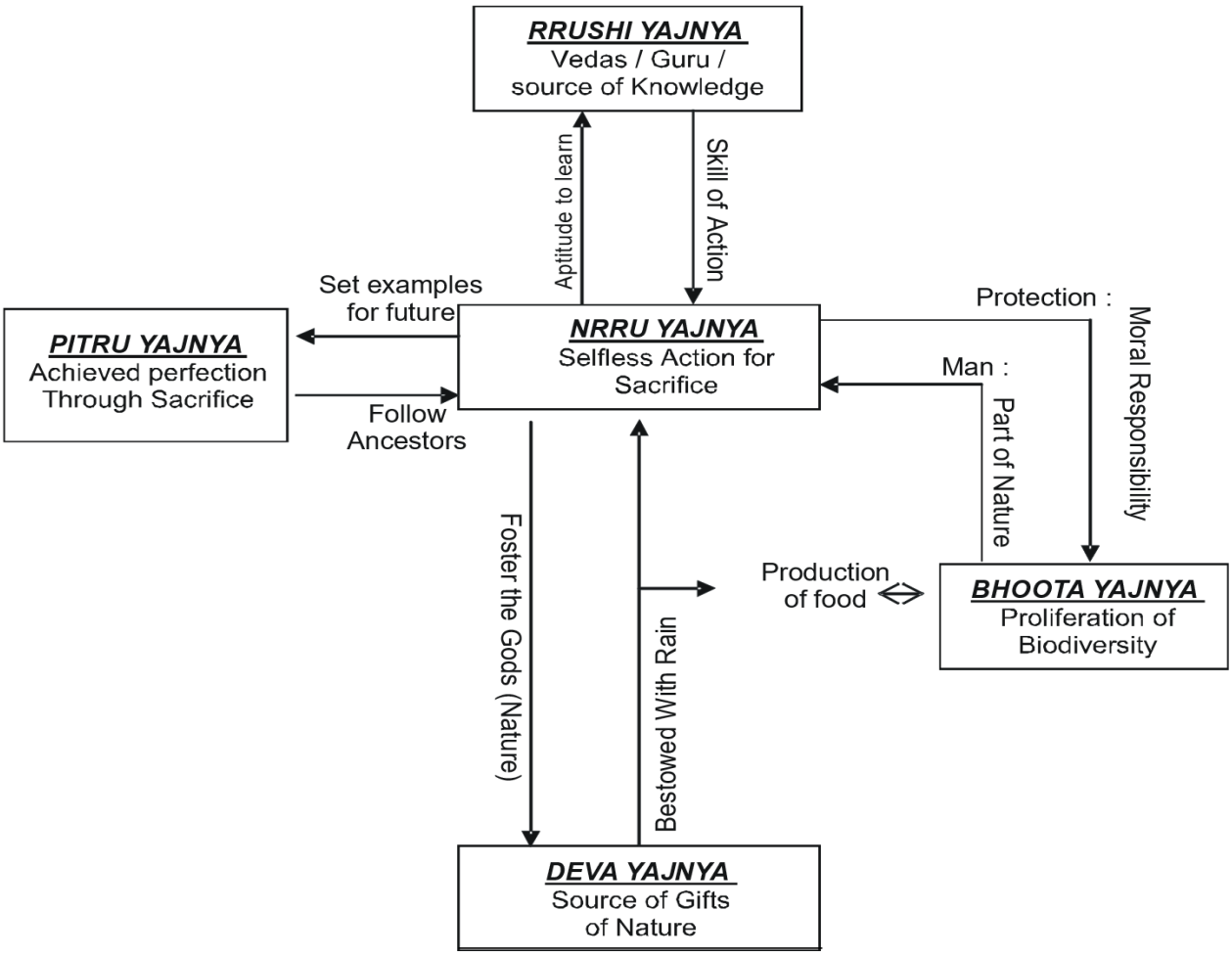
maharṣīṇāṁbhṛgurahaṁṁgirāmasmyekamakṣaram।

yajñānāṁjapayajño'smisthāvarāṇāṁhimālayaḥ ।। 10-25 ।।

"Among the great sages, I am Bhrigu; among spoken words, I am the one letter (Om);. Among the sacrificial rituals, I am the ritual of japa; and among the immovable objects, I am the Himalayas." The concept and performance of various *Yajnya* is elaborated in *Karma Kanda* (Ritual methodologies) of Vedas, which are complicated, expensive and time consuming. But, in *Manu smruti* (Manu), a *Gruhastha* (Householder) is prescribed to perform five sacrifices (*Pancha Yajnya*) as a part of routine activity in daily life.

The concept of *Yajya* seems to be a major principle of ancient environmental science. In nature, all elements are inter-related, and affect each other. Sun is drawing water from the ocean through heat . Earth gets rain from the sky and grows plants. And plants produce food for the living beings. The whole process of nature is nothing but a sort of *Yajna*. This is essential for the maintenance of environmental constituents. The view that *Yajna* cleans atmosphere through its medicinal smoke, and provides longevity, breath, vision etc., is established in Yajurveda. According to Vedic thought, *Yajna* is beneficial to both individual and the community. *Yajnya* helps in minimizing air pollution, in increasing crop yield, in protecting plants from diseases, as well as in providing a disease-free, pure and energized environment for all, offering peace and happiness to the mind. *Yajna* serves as a bridge between desire and fulfillment. It is clear that the Vedic vision to live in harmony with environment was not merely physical but was far wider and much comprehensive. The Vedic people desired to live a life of hundred years and this wish could have been fulfilled only when the environment was unpolluted, clean and peaceful. The knowledge of Vedic sciences is meant to save human beings from falling into an utter darkness of ignorance. Given below is the description of various Yajnyas and their interrelation as shown in the figure1.

Figure 1: Pancha Maha Yanjas and their interrelation with the environment.



Pitru Yajnya : Neglect of this yagña results in the following consequences: Lack of physical and social security in old age, negligence towards parents and elders in the society, genetic exploitation – parentless children (Orphans), adultery – unethical marriage - production of *Varanassankar*.

Bhoota Yajnya: Neglect of this results in apathy of public, destruction of forest wealth, rise in the number of endangered species, expanding deserts, instability in edaphic factor due to spoilage of vegetation, interruption in food chain and flow of energy, deficiency in food supply, insecurity to animal life.

Nru Yajnya : Neglect of this results in diminishing human relationships, failure of composite family, lack of communal harmony, religious hypocrisy, lack of social coordination, unwarranted conflicts and unwanted war, politics without ethics, mass destruction - massacre – depletion of human life value.

Deva Yajnya: Neglect of this results in pollution of air, water and soil, misuse of energy and space – consequences thereof, depletion of ozone layer, global warming / green house effect / exposure to more radiation, disturbed hydrological cycle.

2.8 Yoga for Balance in Bio-Ecology

To restore the ecological balance, either we need to repair the ecological damage and assist the recovery of degraded ecosystems or conserve the biological diversity The latter is to minimise the consequences of ecological imbalance. Of course, the best way is to achieve both the goals. Setting right the ecological imbalance is a long and difficult task since many aspects of political and social concern need to be addressed. While work in that direction should not be neglected, we need to work on our own body-mind so the impact of eco imbalance is minimal. If we are specifically concerned about electromagnetic pollution, there is nothing much we could do except to suggest remedies. The only way to completely cut off these radiations is to live in a steel or copper box! Obviously, this is not going to happen. Hence, it is urgently required to devise methods to counteract these radiations through proper life style, diet, exercise etc.

These are intimately related to attitudinal change and behavioral modification of a person. An individual must be free from avarice, vanity, violence and thirst for self-gratification and over consumption. Until these deep rooted negative traits of personality are superseded by positive ones, mere enactment of laws will not be enough to solve the problem of ecological assault. Yogic lifestyle, through its ethical values under ‘Yamas’ and ‘Niyamas’ and psycho-physical

practices refine the psychic state, breath and postures of an individual. At this refined state of personality, individual starts believing that all the engenderment's are divine and life is denoted for adoration, not for violence and eradication. He upholds the experience that the whole nature is just like an essential part of his body without which he cannot survive. This cumulated state of consciousness paves the way for conservation of ecology and environment. As yogic lifestyle brings forth the feeling of 'oneness' or 'ecological consciousness', it can be suggested as a very congenial model for conservation of ecology and environment (Betal, 2008).

2.9. Model Explaining Relationship Between Disease And Ecological Balance

Disease is due to ādhi and vyādhi. Vyādhi is the result of eco-human imbalance caused by pollution of water, air or food- a byproduct of man's undesirable activities. Presently, the air ways are polluted due to electromagnetic (EM) radiation. This pollution affects humans in many ways as the energy penetrates the body and could cause disruption at many levels. At the body level (annamaya kosa), there is failure or improper communication between cells and the control mechanisms could fail. At the prana level (pranamaya kosa), transmission of subtle energy of prana or its equivalent, chi is vitiated. At the manomaya kosa, depression and problems related to central nervous system are seen.

When a total disruption in the first three kosas and resultant vyādhi is seen in a person, it is necessary to treat all the kosas. Treating only one kosa will not have the desired or long lasting positive outcome. While we cannot escape from EM radiation in most places, we need to address all kosas and concentrate on annamaya kosa where the trouble sets in. Yoga as practiced and recommended at this University does exactly this: starting with the body all kosas are brought back to normalcy.

The outcome of the studies to be reported in Part II suggests that chanting of Om mantra, changes in life style, proper mind related procedures such as meditation and mantra japa and exposure to philosophical thoughts and actions are necessary for mitigating the impact of EM induced vyādhi.