CHAPTER VIII

Ecology Its Preservation
and Protection in the Vedas
8.1 Ecology

*Vedas* are the oldest source of Indian culture and tradition. They propound the most complete, holistic perspective of the universe. In the present state of ecological imbalance on this earth, it is necessary that we draw upon our fund of ancient Vedic knowledge, so that we can attain or reach a sustainable growth or development.

"Ecology" is the study concerned with the interrelation of living organisms and their environment. "Conservation" means management, protection and preservation of earth’s natural resources and the environment. Accordingly to the *Vedas*, all life in the cosmos is interrelated and interwoven, the process of transmutation and cyclic degeneration and regeneration of life is an accepted postulate. In every aspect of vedic literature Man-Nature relationship is reflected. The *vedas* also insist upon the ecological balance and the preservation of our planet through a number of incantations and rituals.

The *Suktas* related to environment in the *Rig Veda* mainly are the *Purushasukta*, X.90, the *Hiranya Garbhasukta* X.121 and the *Nasadiya Sukta* X.129. Apart from these *Suktas*, Seer *Dirghatamah* also gives lot of information about the creation and environment.

8.2 Purusha Sukta

According to the *PurushaSukta*, the “Purusha” is the manifestation of all things and he has been called as “Viraj”.
The *Purusha* is the first man, "*Adipurusha*". The supreme spirit created the body of the "*Virat*". The *Virat* is the egg of *Brahman* and life is given to it.

As soon as he is born, he became manifested and after words created the earth and then corporal forms. To this *Purusha*, the gods performed sacrifice to give oblations. From him born the *Richas, Samans* and *Yajus*. From him born the horses and other animals. The moon from his mind, the sun from his eye, *Indra* and *Agni* from his *mouth* and *Vayu* from his *breath*.

**8.3 Hiranyagarbha Sukta**

The *Hiranyagarbha Sukta* says that

हिरण्यगर्भ: समवर्ततामेः  
सूतस्य जात: पतिरेक आसीत्

Rg.X.121.1

At the beginning *Hiranyagarbha* was present and he was the sole lord, of everything. Through his greatness the snow-clad mountains exist. The men, all oceans and rivers are his property. He is the giver of soul and strength.

आपोह यदू बृहत्तिवित्त्वमायायः द्वान जनयतितिर्मिन्भ

Rg. X.121.5

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When the vast waters over spread the universe containing the germ “Brahma” and giving birth to Agni, then was produced the Gods. By him the sky was made profound and the earth solid, by him the heaven and the solar sphere were fixed. He is the measure of the in the firmament (Heavens).

In the Vedas his power of creation is described highly and also said that he is the creator of water. Thus

यश्चापश्चक्ष्न भूता बुधतीर्षज्ञान

Rg.X.121.8

He by his might beholds the water all around containing the creative power. So the water, which is created by him, is not ordinary water. The water itself contains the power of generation.

यश्चापश्चक्ष्न भूतां तीर्षज्ञान

Rg.X.121.9

He generated the vast and delightful waters. The Yajurveda says 12.102 – प्रयम: आत्माधिकः: means He has first produced or began the delightful waters.
8.4 Nasadiya Sukta

The *Nasadiya Sukta* says everything that existed in the *water* only. *Sayana* also justifies it “हि यथ अन्यें सलिलम् अस्ति” “This in the beginning was *water*”.

र्ग: असीतमसा गूज़हम्नेमेञ्जकेत सलिल सर्वमा हि

Rg. X.129.3

This entire world was undistinguishable *water*.

According to *Sayana*, the creation was sudden, which was developed in the twinkling of an eye, like a flash of the sun’s ray. It was so quick that the creation took place simultaneously in all the three portions of the universe. The order of the creation was mentioned in “*Taittiriya Aranyaka*”.

आत्मन: आकाशः सम्पूर्त आकाशाद् वायू वायोर्गिनः

Tai A.8.1

Though the order of the creation was said, but it has been enumerated that the development was like a flash of lightning, so that the series could not be distinguished.

तत्रूप्तां तदेवायुम्यविषात्

Tai. A. 8.6

The *NasadiyaSukta* raises a number of questions about the creation like when it was created and when it was engendered. But it quietens all the enquiries about creation, itself by saying.
From him the creation arose, He is the superintendent in the highest heaven. *Chandogyopanishad* also supports this.

‘स भगवः करिमनु प्रतिष्ठित’

Cha.Upa 7.24.1

He only knows how to uphold this universe. He is the creator and protector of our environment. He only knows who has created everything that is nobody else than him.

**8.5 Views of Rishi Dirghatama**

*Rishi Dirghatama* has given more information about heaven, earth its creation and its sustenance.

उत मनः पितुरुहो मनः माहुः

रत्नवस्तङ्गोऽभिमः।

हुरेतस्स पितरा भूम चकतुरुरः

प्रजाया अवृद्ध वरीमः।

Rg. I.159.2

I verily propitiate, by my invocation, the mind of the benevolent father, and the great and spontaneous affection of the mother of all beings. The parents, with kindness, have secured, by their excellent protections the vast and manifold immortality of their progeny. *Dyuloka*, Heaven is considered as Father and *Prithivi*, Earth as the Mother. This is agreeable to the text.
"Dyaur Vah Pita, Prithivi Mata"

Yaska denotes Antariksha, the firmament as Mata.

माताज्ञातिः निर्मायते असिन्यातानि।
Niru.2.7

These two divine heaven and earth are the diffusers of happiness on all.

ते हि धारापृथिवी विशवकालः।
Rg. I. 160.1.

A metaphorical description of rain from clouds, which is formed by sun through evaporation of water, can be seen in Rg.I.164.8. The seer says that fires rejoice the heaven; clouds give joy to the earth, and uniform water passes upwards and downwards in the course of days. Sun is the germ of water, because of the sun, herbs, lakes and ponds cherish. Rg. I. 164.52.

8.6 The BhumiSukta

The Bhumisukta of the Atharvaveda is one of the oldest and the most important sources of information on the relationship of man and his environment and his duty to preserve it. In the sixty-three verses of this hymn, the seer Atharvan has presented a beautiful picture of Mother Earth, which is the basis of our sustenance and also a symbol of the entire environment. The verses reflect the symbolic significance through a sensitive comprehension of ecology and conservation.
“Bhumi” i.e. the Earth is invoked here as the personified Mother Goddess. She supports us by the abundant endowment and riches. It is she who nourishes us all like a loving mother nourishing her children (Av. XII.1.10). This sentiment clearly shows the bond between the earth and the human being and exemplifies the true relationship of human beings to other forms of life.

In fact, earth in the Bhumisukta does not merely mean the land. She rather represents all that is part of the environment. She symbolizes the three principal components of environment solid, liquid and gaseous. She is described as born out of the waters of ocean. Surrounded by space, she is the creator and sustainer of the world.

The origin of the universe has been traced to waters in the oceans.

It has been called Viswambara or the feeder of the Universe. It bears fire which is the root of the universe.

This probably implies the heat obtained inside the earth’s crust. In its solid form, Bumi is the land and abode of living and non-living beings, also guardian and protector of all that is born and is to be born
Rocks stone and dust constitute the earth; its soil is brown, black variegated (Av.XII.1.26).

On the liquid side of the environment, *Bhumi* is the sustainer of oceans, rivers and *waters* (Av. XII.1.8). She is the wife of clouds and is enriched by rains (Av.XII.1.42)

समानाप: परिचार: समानीर्कोत्र: अत्मांिंद क्षरनि ।
सानोगुंम्णियिरियारा पयो दुःसमयो जश्लु वर्षसा ॥

Av.XII.1.9

The *waters* keep flowing incessantly all around this earth. The motherland of ours may milch water and milk through its varied streams. Let it nourish us with energy and glow.

*Bhumi* is called “agnivasa” having fire as her covering. She also represents the energy or the element of fire in the environment. Av.XII.1.19 says that *Bhumi* bears with her the universal fire, which is present in herbs, waters, stones, men and horses. *Agni* gives heat and shine to the earth. The earth also has rich treasures of gold, gems and metals (Av.XII.1.44). She carries with her the seasons brought by the sun, her companion (Av.12.1.48).

The physical aspect of the *Earth* includes agriculture. Fertility of the earth is symbolized here through the image of brimming bowl. Foliage and lotus emerge from this bowl. Waters flow and energy is everywhere in the vegetation. She bears herbs of various varieties. Food such as rice and barely came into being on the Earth (Av.XII.1.2, 4). In this way, the Earth is a figure of fertility.
The Earth is the world of all living beings. It is the source of life. All the races of men belong to her. The people belong to her use different languages, practice diverse customs and manners. But she treats all alike.

Not only human beings, ferocious animals also are children of the same mother Earth. Serpents and scorpions lie under the ground. Man-eating animals like Tiger, Lion, Wolf, Jackal and reptiles are all on the Earth. The seer of this Sukta wishes that they all should live together homogenously. Accordingly to this integral view nothing in this universe is without its utility. Each and every species has to be protected for its own sake so that the equilibrium of nature is not disturbed.

It is against this background that the land, water, air, fire, plants, animals, humans and divine beings came together in various images of the Goddess Bhumi, Mother Earth. The Heaven, the Earth, and the Atmosphere have given this vastness of vision to the seer, while the fire, the sun, the waters and the gods have given him the wisdom (Av.XII.1.53). He, therefore gratefully reveals the sublimity and divinity of Bhumi.

A long way from the vedic age, we are now in the 21st century. The environmental issues have emerged as a major concern for the survival and welfare of mankind on this planet. The rapidly advancing science and technology, fast growing economic system, the modern civilization is under increasing threat from its own activities causing pollution of air, water and soil. The ozone hole, acid rain, nuclear and other toxics wastes, chemical and pesticide industries, the fear of global warming, pollution of river and oceans, deforestation and the consequent soil erosion and the loss of bio-diversity are just a few highlights of the

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development model adopted across the globe and causing ecological concerns.

The multiplying demands of the growing population are rapidly exhausting the resources of this planet. The global warming bringing the temperature variation rapidly, leading even the Himalayas to melt. As a result of the water sacristy arid lands have increased. It is estimated that in this sub-continent alone a million hectares are being turned into desert each year. Because of the deforestation, the soils capacity to absorb and hold water is diminished.

In the Vedic view, sustenance of ecological balance is regarded as the first and foremost duty of man. Preservation of natural resources is emphasized in the Vedas.

8.7 Cloud Formations and Rain in Vedas

Rains are necessary for making agriculture fruitful. However hard the farmer may try, he has to depend up on Nature for success in agriculture. In the Sukta of Av.IV.15.1 the Rishi Atharva offers prayer in praise of Parjanya the gods of the cloud for bumper rain.

\[
\text{समुपत्तन्तु प्रविष्टो नमस्तवः: समप्राणि वातजुतानियतन्तु ।}
\text{महानवस्मय नवतो नमस्ततो वास्मा आपः पूर्विस्बे लर्पस्तन्तु ।}
\]

Av. IV.15.1
May the directions and the sub directions reach the earth along with rains carried by wind come ‘o’ clouds, roaring like a huge bull and quench the earth.

Regarding the rains, *Vedic seers* not only described their importance but also explained clearly the scientifically proved mode of cloud formation. Vedas say that the water in the form of vapors rises in the sky and then come down in the form of rains on the earth.

अपः समुद्रादु दिवमुद्रहन्ति
दिवस्वृषिवृ माद्ये सुन्तनि ।

Av.IV.27.4

Here *Marut* is regarded as the rain creating God

*Rgveda* says that the water of upper ocean go to water of lower regions in the form of rains.

स उत्तरस्मादश्रं समुद्रमयो
दिव्या असूज्जुव वर्ष्या अभि ।

Rg.X.98.5

The rains are the waters held in Upper Ocean by the gods are released at the appropriate time in the form of rains on earth. *Vedic seers* knew that the rains are formed in the sky. They also knew different kinds of clouds. Clouds only can quench the thirst of the earth.

पृष्ठिं पर्ज्जया जिन्यति

Rg. I.164.51

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Marut is regarded as the leader of the rains.

अा यं नरः सुदावयो ददाशये विदः कौशमपुष्पितः।
वि परज्ञयं सुनिष्ठित रोदसी अनु धन्यं वाचनं याति वृष्ट्यः॥

Rg. 5.53.6

Leaders of the rain, munificent givers they cause that which is the treasury of water to fall from the sky, for the benefit of the donor, they let loose the rains cloud, and the shedders of rain spread with water everywhere. *Atharva Veda* also has number of references regarding cloud. Cloud is regarded as father

परज्ञयं पिता

अयो निविष्णुभु असुरः पिता नः॥

Av. 4.15.12

He who makes the rain to pour down is equivalent to our father.

भूमिं परज्ञयं पयसा समझधि

Av. 4.15.6

“Parjanya”, the holder of water, quench the thirst of earth with abundant rain.

समुपवत्तनु प्रविष्टो नमस्त्वती

Av. 4.15.1

Let the directions, full of mist, fly up together let clouds come together.
O! Cloud let pour out the treasure of waters.

_Yajur veda_ also quotes as-

"यक्षात् भवति परजन्य and अम्रादु वृद्धिं"

Also the Vedic people knew that thunder sounds of clouds when they compare it with the roaring of the cow Rg I.38.8.

Rain water is said to be best form of water. In _Atharvaveda_ it has been said “_Pranam Prajabhyo Amrtan Divaspavi_”.

**प्राण प्रजाप्तो अमृतं दिवस्परि**

Av. IV.15.10

Rainy water is nectar (*Amritam*) and it is life for the human beings.

The _Vayu_ with water is called _गन्धर्व_ thus else where,

_गोमुख गामू जलम् धरति इति गन्धर्व_

Due to rains the earth becomes fertile giving birth to plants and trees, which in turn nourishes the health of human beings.

**स्यस्यमेतो पृथिवी नन्मीति**

**स्यस्यमेतो शापदन्तंपूर्वेति।**

**स्यस्य वतं ओषधीविभक्तत्वः।**

**स न: पर्जन्य महिष्मां यथ॥**

Rg.V.53.5

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The rains are called the protector Rg.V.83.6 and the rainwaters are regarded as the life—savers and the precious treasure.

महान्तं कोश मुदवा नि विष श्रुव

Rg.V.53.8

This treasure is always desired by people living on the earth because it causes the rivers flow with full of waters. Nature gives its best to human beings for their survival through this rain. Rgveda 9.8.8 thus

बृद्धि दिवः परिस्रव हुन्न नृथिवां अधि।

Rg.IX.8.8

"Pour down abundant rain upon the earth"

वर्षस्य सर्गा महयस्तु भूमिः।

Av.IV.15.2

Let the rain make the earth fertile.

पृथक्क जायतां वीरुभ्री विश्वरुपः:

Av. IV. 15.3

Many medicinal herbs will be born because of the rain.

बाश्र आप: पृथिवी तर्पण्यतु

Av. IV.15.1

Let the downpour satisfy the earth.

अदिदृ दूस्रेन पृथिवी भूस्वः;

AV. VI.22.1

Rain moisturizes (softens) the earth with the water.
Vedas not only explain the advantages of rain, it also mentions the aftermath of the heavy rains Rg.V.83.10. Too much of rains will lead to flood and destruction.

It is very clear from the above Vedic Mantras, the Rgvedic people were very much aware of the cloud formation and the occurrence of rain as well as the water cycle.

8.8 Irrigation

The seers of the Vedic era are well aware of the numerous rivers of their age. The flowing water is more important for irrigation. The rivers like, Sindhu, saraswati, Sutudri Parushni, Vipas, etc. are all praised because they only fertilize the land. Thus, Rg III.33.4.

एना वर्ष फळसा पिन्नमाना अनु योवि देव कृतं चरतिः
The rivers speak fertilizing the land with this current. ‘We are flowing to the receptacle which has been appointed by the diety’.

All agriculture, says Parasara, has rainfall as its root; life too has rainfall as its source.

वृक्षसूला कृषि: सर्वं वृक्षसूलं च जीवनम्

Krishi-Parasara
Numerous hymns are there in the Vedas praising rain. Mainly Indra, Maruts, Parjanya were praised for abundant rain. Thus Rg 1.8.6

\[ \text{स नो वृष्णन्मुः चरु सत्राधवनया वृषि ।} \\
\text{अस्ममपमपरिषः ॥} \]

"Indra, shedder of rain, granter of all desires. Set open this cloud.

In Rv I.16.5. Indra is armed with thunderbolt, for the good of the man he makes the water to pour down. In one place God Tvastri has been prayer thus.

\[ \text{तन्नसुरीपमल्लुड़ियं पुरुष वारं पुरुतमना} \\
\text{वक्ष्या पौष्यो वि स्थुत राये नामा नू अस्मशः ॥} \]

Rg.1.142.10

Send to us for our nourishment and prosperity, the quick falling, wonderful, abundant rain.

It is a very common thing that untimely and uneven rain fall leads to crop failures. Hence the Vedic seer Bharma Atri says”

\[ \text{अवशीवसमुद्र शू गुभायाभवन्नवायतेतवा उ ॥} \]

You have rained, o’ Parjanya, now check well the rain, you have made the desserts capable of being crossed.

The Vedic farmers had realized the importance of constructing channels for carrying waters from river and well.

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The climatic conditions such as scanty rainfall, dry air, and high temperatures in summer make the storing of water difficult. Vedic people also knew the principle of collecting water from catchments hilly areas. Considerable technical knowledge and skill should have existed in building canals and dams. But the knowledge must be primitive and rough ones like piling of boulders or reeds and wattle, enough merely for diverting a portion of the floodwater into canals. The existence of such knowledge is seen in the water spread over the lower place.

The uncontrolled rush of *waters* destroys the banks by erosion. The control of such erosion was known and evidently both substantial and beautiful embankments were constructed. Thus

एता वि पृथ्वी किमिवः भनति ।
कमायो अद्विती परिधि रूपस्य ।

Rg. IV.18.6

"Ask these flooding *waters* which embankment, mountain do they destroy?"

'Wells were definitely known to the Vedic people as an alternative source of water other than river and rainwater. They were not only used for drinking and domestic purposes, but also for irrigation. The importance of well is realized in various contexts such as-

कोशेन सिक्तं तं वंसमतालतुषाणो न वस्मः ।

Rg. I. 130. 2

As a thirsty ox or a man hastens to a well -----

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“As herds towards well”.

Throughout the ages, the provision of water for irrigation facilities was regarded as the prime obligation for the Govt. and the rulers, the kings and the nobles and wealth men in general.

“The Sukraniti IV.125.29. Reiterates that “Wells, canals, tanks, ponds, should be made accessible there should be many of these, so that there may be plenty of water in the kingdom. Bridges should be constructed over rivers.”

The Arthasastra II.1.20-3 gives copious information regarding construction of dams, canals, management of canal water. III.6.1.7 of Sathapatha Brahmana states how nature and water are interdependent.

Waters and trees depend upon each other and enrich each other and together they enrich the mankind. It is an interesting fact that waters have been preserved to rear the plants and trees who in their turn are...
being planted on the banks of the reservoirs and rivers to preserve the waters. Trees are planted on or by the side of the tanks, ponds, rivers etc. to avoid soil erosion. Trees like Amla, Tanri, Pungka, Karanya, Asvatha were generally planted along the riverbeds and borders of the tanks. These trees not only control the outflow of the water but also clear the water and removes the impurities.

It may be interesting to note the Parumamilla Tank inscription of 1369 A.D. [Ref. Epigraphica Indica, XIV PP. 107, VV 22-7].

"Making charity in various ways in keeping with the treatise of Himadri he heard that the merit attaching to the gift of water was the greatest of all so, thus the inscription says providing water is best of all deeds. Veda says all this is water at the time of creation and "Sruti says from water alone is produced food and food is Brahman".

There can be no doubt that water alone is the seed of the world of movables and immovable. And the superiority of the water is described as –

Even the great Siva is the bearer of the Ganga, Vishnu has the ocean for his abode and Brahma has sprung from the water born Lotus. Hence water is superior to everything and everything exists in it.
8.9 Ground water science in Vedas

The present water crisis is asking for a reorientation of the ground Water sciences. Many areas in our country are arid and semi arid places with poor rainfall. Every year crores of rupees are being spent to drill bore wells to meet the domestic, agricultural and industrial needs.

8.9.1 Meteorology

There is evidence to believe that the earliest portions of the Rgveda were composed about 7000 years ago, when the first point of the Aries of the celestial sphere was in the constellation Orion. Corresponding to the Arudra Nakshatra of the Indian Panchanga. The earliest Vedas composed near Afghanistan and the last ones composed near the extinct river Saraswati. So, we can say that, the people of vedic age lived in the area extending from Afghanistan to Pakistan and Punjab where having the same whether conditions.

In several of the hymns of Rgveda the meteorological phenomena are taken as manifestation of super natural beings, who in habit the skies. They have been called as Devas and given different names. For example:

Maruts, Parjanya, Indra, Varuna, are all regarded as water deities. In conclusion it seems that the Rgveda contains several hymns, which describe various meteorological phenomena associated with rain and personify them as deities. These hymns also contain prayers addressed to these personifications for providing favorable weather to the race to which the poets belonged. It looks as if the home of Rgvedic Rshis had

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experienced the same weather phenomena as those areas experience now, almost 7000 years later.

8.9.2 Ground Water

The present water crisis is asking for a reorientation of the ground water sciences. Many areas in our country are arid and semi arid places with poor rainfall. Every year crores of rupees are being spent to drill bore wells to meet the domestic, agricultural and industrial needs.

8.9.3 Hydrology

Ground water overdraft is accelerating. Unsustainable ground water use occurs almost on every continent except Antarctica. The scientific community has acknowledged that human interference in global climate is now evident and that the hydrological cycle will be seriously affected.

The available fresh water is being recycled and purified in a system called the hydrological cycle. Water is not lost in undergoing various processes of hydrological cycle namely, evaporation, condensation, rainfall, stream-flow etc., but gets converted from one form to another was known to Vedic people. Water intake plants, division water into minute particles by sunrays and wind, different types of clouds, their heights, their rainfall capacities etc., along with prediction of rain fall quantity in advance by observation of natural phenomenon is illustrated in Puranas, Brihatsamhita (550 A.D), Meghamala (900A.D) and other literature.

The references of rain gauges are available in Arthasastra of Kauyilya (400B.C) and Ashtadhhyayi of Panini (700 B.C). The quantity
of rainfall in various parts of India was also known to Kautilya. Indians were acquainted with the cyclonic and oceanographic effects on rainfall, radiation and convectional heating of Earth. Various other phenomenon of infiltration, interception, and stream flow, geomorphology, artesian well and erosive action of water were well understood. Ground water development and quality consideration were getting sufficient attention as evidenced by Brihatsamhita (550A.D). Water management and conservation, well-organized water pricing system in 400 B.C, construction methods and materials of dam, tanks etc. mentioned in ancient books reflect the high stage of development of water resources and hydrology in ancient India.

8.9.4 Ground water in Varahamihira’s Brihat Samhita

An excellent work on ground water exploration in Sanskrit is done by an author called “Varaha Mihira of 5th century A.D.” He is a renowned astronomer, astrologer and mathematician. Its 54th chapter entitled, “Dakargalam”, with 125 slokas deals with various environmental indicators comprising biological and geological features to locate ground water. This is a systematic and scientific work.

8.9.5 Scientific Basis

Occurrence of an aquifer (i.e. underground water bearing geological formation) concealed in a waterless tract results in environmental heterogeneity. The plants of such places exhibit different morphological and geological features. These symptoms have been taken into consideration as the ground water indicators in Brihat Samhita.
The classification of the indicators are based on

1. The trees whose roots habitually reach ground water.
2. Trees united with another tree with different speices
3. Soil-water – plant relation Eg : grasspatch in grassless area or an agricultural field, a particular place where seeds do not germinate etc.
4. Physiological features of trees like glossy leaves, bleached flowers etc.
5. Morphological features of trees like, profuse growth of foliage; elongated and droop branches; disordered fruit and flower thorny tree in a green bush.
6. Varaha Mihira also gives a list of species, which are drought resistant and describe the xenomorphic characters (with standing dryness) of plants indicating the absence of ground water at accessible depths.

He has done an extensive study on plants to locate the ground water.

8.9.6 Termite Mounds

Some times termite mounds are also taken into consideration to locate the water table. The earthen mounds built on the ground by termites or white ants are popularly called “ant hills”. These are very common in tropical regions.
The hymns entitled Visadusam in Atharva Veda have pointed out the relationship between the termites and ground water.

येषो देवा उपजीक्श्यो आसिन्न्वन्न्युदक्सम्।

tt:

Av. VI. 100.2

"The water has taken from the mouth of a white ant in the barren land".

The white ants are of peculiar nature. They can produce water even in a place of absolute dryness. They take the moisture of the air to moisten the earth. The water of this kind carrier certain medicinal value against poison. This can also be used in diabetics.

The Tittiriyaruyaka V.14 describes the termites as "Upadikas". Penetrating to water wherever they dig. Hence Varaha mihira described then termite mounds built at the base of the trees, or those having colonized growth of vegetation, or those occurring in a row, are as indicators of ground water. It may be noted that the microenvironment with in a termite mound is characterized by high relative humidity, which is an essential pre requisite for the very survival of the termites in arid and semi arid tracts.

Varahamihira has also pointed our certain geophysical characteristics basing on the colour of the rocks as ground water indicators. But mainly the plants and the termite mounds, associated with various types of vegetation, have been emphasize and elaborately described as ground water indicators in Brihat Samhita.
8.9.7 Well Sites

The top of a ground water body is called “water table”. Its rise is brought about by several factors depending upon the humidity of the surface. The roots of shrubs and trees contribute a lot to the physical and chemical break down of rocks. This will facilitate the rainwater infiltration leading to the accumulation of large quantity of ground water. In this regard, the effect of the extensive ramifications of underground channels developed by the termites is the same as that of the plant roots.

Thus Varahamihira’s indications suggest spots of high relative humidity for selecting the humidity. Hence, now it is clear from the account of Varahamihira that ground water science is multi disciplinary in scope, outlook and participation.

Wells existed even in Vedic times

\[ \text{रूढ़ नुद्रेवतं} \quad \text{Rg I.85.10} \]
\[ \text{जिह्वंनुद्रेवतं} \quad \text{Rg.I.85.11} \]
\[ \text{आवृतासो अवतासो} \quad \text{Rg.I.55.8} \]

The word Avata indicates the existence of well in the Vedic period. Also Rg.I.116, 9 and 12 suggests the same thing. Well water was used for drinking purposes. Thus Rg I.116.22

\[ \text{शरस्य विदार्षतक्ष्मयायतावा} \]
\[ \text{नीचादच्चा च करं: पातवे वा: ।} \]
“You raised water from the bottom to the top of the well for the drinking of Sara, the son of Rcitka”

“Nasatya has been praised for quenching the thirst of Goutama in Rg I.116.9. The shape of the well also has been give.

परावत नासत्यानुदेशामुच्चावुनं चक्रपुर्ज्ञावारस्वः।

“Nasty, you raised up the well and made the base, which had been turned upwards, the curved month,” so that the water ------“ Here the description is some what obscure, but it is clear that the seer tries to give the shape of the well.

The wells are full of water, which is not easily exhausted mentioned in the Rg.Veda I.102.5.6.7 and the water was used for drinking purposes of men and cattle. Thus Rgveda I.102.5

सित्वामाहा अवतमुद्व्रिं वं शुषेकमनुपरिततं।

उद्विं सित्वाः अशक्तिः।

Rg I.102.6

These two mantras tell about the exhaustive nature if the well which is full of water.
8.9.8 Water Witching

Water witching is very common in our country and it is very commonly adopted. The practitioner of this art has an ability to locate the well sites by using a forked twig pendulum, bent wire or other devices of various shapes. But we should admire Varahamihira’s way of water divining which does not adopt any magical method. Every method he has suggested has a sound scientific basis.

Sometime back in 1981 two major projects sponsored by ISRO and UGC carried out experiments in the Chittor district of Andhra Pradesh basing on the Varahamihiras theory. Almost a hundred and fifty well sites were located for rural water supply. This proves our ancient people’s wisdom. Now also we can take up some projects to avoid the water crisis in the states like Tamilnadu, Bihar, parts of Andhra Pradesh and Orissa.

8.9.9 Watering of Plants

Our ancient texts have taken care of watering of plants at micro level such as watering transplantation and after their growth individually and collectively. We can see the macro level water supply with the irrigation facilities.

Rain was the main source of water in Vedic times. Thus

Av. 4.15. 1 to 8

सर्षो वर्षस्य वर्षस्तो वर्षालू पुषिवीमान् ||

Av IV. 5.4

“Let gushes of raining rain along the earth”.

Ecology – Its preservation and protection in Vedas
The Vedic people also stored water for watering purposes. The word “Varta” in Av I.3.7 indicates a tank. It has been mentioned in Satapatha Brahmana I.7 and I.8 that plants spring up and grow naturally in rain water. Rg VII. 2.19 to 24 records the fact that plants were watered with jars. Wells were used for irrigation purposed. The word “Avata” means well and they were full of water thus in Rg Veda. I. 55.8, I.85.10, 11, I.116.9, 22 we find references of well, which are full of water.

Rg Veda X 101.5-7, informs that a wheel made up of stone attached with a strap and pail Kosa was used to raise water from the well and it was then poured from the well and it was then poured into buckets made of wood – ‘ahava’.

सर्गा वर्षस्य वर्षतो वर्षन्तु पृष्ठीवीमनु ॥

Rg.10.102.6

“I pour out the water of the well, whose cattle troughs are prepared, well fitted with straps”. Etc.

The word Udhayan in Panini III 3.123 clearly indicates that irrigation with water from wells was inpractice during Paninis time. Even from the early Vedic age we get evidences about construction of dams and canals. Rg IV.33.7 the Rthus led forth the rivers and rendered the land fertile and the waters spread over the lower places.
8.10 Agriculture

Throughout the ages agriculture has played an important role. The first and foremost thing that binds the civilized people is the agriculture. People need food for survival. Hence they get activated in forming.

The Vedas accept farming as a very holy occupation. The Rgveda gives graphic description of ploughing the fields and reaping the green harvest. Sukta 4/57 of Rgveda is entirely devoted to agricultural. It prays for the farmer who owns the fields. The Veda teaches how to sow the fields through ploughing. Framing was not a low vocation. It was respected by one and all. Farmer was called as Ksetrapati. The wise and intelligent people used to inspire farmers for ploughing. Thus Rg.10.101.4

सीरा मुख्यति कबयो युगा वि तन्यते पृष्ठकः
धीरा देवेदु सुन्नया

"The wise priests harness the ploughs, they lay the yokes apart, firmly devoted through the desire of happiness".

Veda gives details about agricultural implements. Tools like Stega, hala, Lantala, Sita, Sira, Asta etc are mentioned. The plough able and unploughable lands have been classified as urvara and farvara. The fertile land was subdivided in to fields of equal area.

वेद विस्मृतिविषय वि मुहुर्तन्तातैः

Rg 1.110.5

Ecology – Its preservation and protection in Vedas
Normally two bullocks were yoked into the plough but this number could be six, eight [Av.6.91.1], twelve [Tittiriya samhita T.S. 1.8.7.1] and even twenty-four also. The *Atharva veda* refers करीबिणि फलवती सुधापिऽ्राम। Here करीबिणि means cow dung also Av 3.14.5 supposed to be the best manure. The cow shit has been called “Sakrita” in Rgved. I.161.10. Repeated yields weaken the fertility of the soil. *Atharva Veda* 12.1.7 tells the farmers to be especially aware about the fertility of the land.

8.11 Rain through sacrifices

The study of rain in vedas is an important thing. Rain being one of the main sources of water, the Vedic seers made extensive effort to bring natural and artificial rains. Natural rains has been brought by praying Gods like *Varuna, Indra, parjanya, Vayu*, etc. But at times by doing *Yajnas* Vedic sages brought rains. Thus –

ुष्टिवेष में यज्ञेऽन कःपत्तागुः

Yajur – 18.9

Means the rain which we got from the clouds are brought by sacrifices. In the Vedic age sacrifices play an important role. Hence it has been said in the *Atharva Veda*.

अर्यः यज्ञो विवर्त्त्य भुवनस्य नाभिः।

Av. 9.10.14

Priest “Brahman” is the highest firmament of speech and sacrifice “यज्ञ” is the navel of all existence.
By the sacrifice the Gods sacrificed to the sacrifice, those were the first ordinances. “Dharman”.

For the sake of knowledge god has created “Sacrifice”.

God, Having shaping the earth, the first sacrifice was born.

The Yajuna Karta attains heaven. Clouds are the root cause of rain. Clouds give rain to us and these clouds can be formed by making Yajna. Thus the Yajurveda says.

Ecology – Its preservation and protection in Vedas
Since the sacrifices give rain they can be called as

\[\text{वर्षवृक्षमसि}\]

\[\text{Yaju – 1.16}\]

\[\text{मित्रावरुणी त्वा कृप्यावतम्}\]

\[\text{Av. 5.24.5}\]

Often *Mitra Varuna* were praised for protecting from rain. So it seems that the vedic people praise *Mitra Varuna* when the rains are intermittent.

\[\text{मित्रावरुणी त्वा कृप्यावतम्}\]

\[\text{Yajur – 2.6}\]

Also *parjanya* has been asked not to rain when there is no need

\[\text{निकृष्णे निमित्ते: न: पर्जन्य वर्षतु ।}\]

\[\text{Yaju 22.22}\]

Let the rain come whenever we need it. This means the Vedic people also knew to stop the rain. They can get rain by doing यह as well they can stop untimely and unwanted rains.

The Rgvedic priests with suitable libation and abundant sacrificial food in the *Yajna* got enough rain or the celestial waters thus Rgveda-10.30.2

\[\text{अध्यर्वो दृविषयतो हि शूतान्तपत्र इत्यो शक्तीरथम: ।}\]
\[\text{अव याश्च अरुण: सुपुर्णात्मस्य वर्षृमुग्धा सहस्ता: ।।}\]

*Ecology – Its preservation and protection in Vedas*
The oblations given to the gods like (मित्र, वरुण, इत्यर्गु) in the sacrificial fire will create smoke which in turn form clouds. Thus clouds will given us rain. Hence Yajurveda Yadha develops rain. (यजुर)

वर्षद्रुवमसि

Yajur 18.9

The rain which we get by doing यजु is high in quality

महुवाताः अत्तताणि महुवार्तित सिन्हवः।

Yaju 13.27

The molecular formula of water H₂O is also established in Vedas.

मित्र इवे पूतदेय वरुण चरिणदस्मु।

Rg I.2.7.

Mitra and Varuna are said to cause rain indirectly by producing evaporation, the vapors thus raised becoming condensed in the atmosphere descend again in the form showers.

In the above Mantra Mitra is said to be oxygen and Varuna as hydrogen. (रिषाद सम्) Means, that which eats away or rusts the metals by combustion of carbon.

पुत्र : = Pure
स्रस्मू : = Energy

Ecology – Its preservation and protection in Vedas
In the vedic literature *Mitra and Varuna* are used for oxygen and hydrogen respectively. The oblations offered in the sacrifice as sacrificial food will form water vapour in the atmosphere. The sound produced by uttering *mantras* during the *yajna* will attract the water molecules. This attraction (London forces) is known as Die pole attraction. This attraction brings together *myriad* water molecules (clouds) resulting in a shower. So, this proves that, performing Yajnas can bring rains.

**8.12 Awareness of Pollution and water pollution in Vedas.**

Environmental Pollution is an acute problem to all living beings. Both the developing as well as developed countries cannot ignore it. The environment includes everything around us like earth, water, space, sound and air. In the Yajurveda we come across certain expressions like.

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अवलं त्वा धावापृथिवी
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Yaju. II.9

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अत्तरं मा हिंसी
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Yaj.v. V.43

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मापे मौषयीहिंसी;
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Yaj.v. 6.22

These are not mere quotations but carry deep significance. The Vedic *suktras* are not mere poetic compositions. The Vedic seers are well-wishers of our universe and they show immense concern over the welfare of the entire universe.
Don’t kill the birds and wild life let them live amidst us. They are our life they are wealth and health.

The Vedic seers were thus scientists and observers themselves. Unfortunately the modern scientists, though they are highly proficient in carrying out new researches and inventions, are not very much concerned about environmental pollution. The chemicals and gasses, which are generated in highly sophisticated and technical processes undertaken by various manufacturing units, have resulted in polluting the atmosphere beyond toleration. Hence protecting the environment becomes serious concern to scientists.

The Vedic seers also wished that man should not destroy the earth. This idea is well established in the Bumisukta (Av.12.1) of Atharva Veda. A question arises as to why the seers or Vedic scientists are worried about the protection of universe. By experience from the old tradition we know that the regeneration is an inbuilt natural phenomenon. Crops are cut and new crops grow again. Man dies to be born again. The sun sets in the evening only to rise again in the next morning. All these show that there is no permanent destruction. The Vedic scientists know that the heaven, the earth, the milking cows and water are made once and for all. Hence, they should be protected. Thus

"सकृष्ठीरजायत सकृष्ठृतिरजायत।
सकृष्ठ पूर्वया दुर्यं सकृष्ठ पयस्त दन्ती नानुजायते"

Rg.VI.48.22
It is clear from the Vedic mantras

पृथिवी मा हिंसी 3.21.10. Av.

That the seers never wanted any damage to be caused to the earth. So, Rishi Dirghatama says in Rg.I.155.4., that we should celebrate the lord who has created the three regions and who is the preserver of the existence. The Vedas say that even the gods would not ignore nature. The nature should be protected to maintain the balance, be it mountains, oceans or anything else. At this point it is necessary to know about the creation of the universe.

8.13 Creation of the universe

According to Rgveda, there was nothing in the beginning, either living or non-living. Everything was submerged in darkness. Some power was born out of Tapas, which created the universe. Rgvedic seers admit the fact that no one knows the time and purpose of this creation (Rg.X.129). The source of creation is not known to the Gods because even their existence is after the creation.

The first stage of creation is said to be Garbha where the absolute Brahma installed the seed of creation in waters. This seed had food and energy from waters. The second stage is the forming of fetus into an egg. Hiranyagarbha Sukta of Rgveda (Rg.X.121) states that, waters sustained this very seed of the creation. The third stage is the development of the golden egg, Hiranyagar by which further becomes prayapati. The fifth stage is known as purusha. There is no clear distinction between

Ecology – Its preservation and protection in Vedas
Prajapati and Purusha. Prajapati is the power, which created the earth, heaven and atmosphere. He is the one who provided the five basic elements earth, water, sun, air and atmosphere. He is the creator of living and nonliving.

The Vedic seer knows that some power created earth and heaven. But, it is not clear that which was created first. He urges the intellectuals to solve the secret about the order of creation (Rg.I.185.1). According to Yv. 37.4. and T.Br.2.2.42. “पृथ्वी प्रवर्तित” The earth is created first. Purusha Sukta says the life on the earth is non-eternal since it revolves in the cycles of birth and death. Prajapati creates virat and from virata emerged Purusha, Purusha released the earth the place worth to be lived upon.

“तस्मादात्रेषु कारणं विद्यते आदिपुरुषः
सजायो अत्यतिद्विपुरुषाः पुत्रिः साय सर: पुर:”
Rg. X. 90.5

8.14 Protecting the universe from Pollution:

Now, after the creation of Dyava and Prithivi it becomes the responsibility of the humankind to protect the universe. Man always desires the best. The seer of Dyava Prithivi Sukta of Rgv. I. 185 wishes dyuloka like a holeless boat. Rg.v. X.63.10 has ample evidence of the fact that our Vedic seers knew minute details of the creations and destruction of the universe. Man needs both wisdom and aptitude to understand the means to protect the universe. That is why the modern scientists are worried about the ozone layer of the sky. The protection of the earth depends upon the protection of the celestial bodies.
We need earth, water, air, food and light to live. It becomes essential for us to protect all these things. The environment where we live should be kept clean.

The Vedas not only contain the secrets of creation of universe but they also give details about its protection. Thus the seer of the *Dyavaprithivi Sukta* of Rigveda I.159 says that the creator can be a successful protector. Hence *Rishi Dirghatam* gives certain qualities of the protection. The giving tendency of God is limitless अनेक non – abstructive – अनर्थ्म full of happiness, स्वर्गः devoid of destruction – अतर्थम; full of politeness नमस्तुः. These are the real qualities of a protector. It is also an accepted fact that he who is associated with creation is also interested in its protection. Else where it has been said that

"अतायमाने अवसावन्ति
अनुष्ठाम रौदरी देवपुष्पो।
उसे देवानुमुखेिरवरी
श्रावा रखते पृथिवी नो अप्यातुः।"

Rg.I.185.4.

The earth and sky protect the creation within the means available to them – अवसावन्ति and in doing so they are hot grieved अवयानां. So, human beings who enjoy the benefits of universe must act to protect them. Now arises a question why such protection is required. This has been aptly answered by the mantra Rg.III.6.3

दीपावल ला पुष्पिणी उपलियाये
निन होतारं सादान्ते दमाय।
यदि किसो मानुषोपवस्त्रिः
प्रयासवङ्कीरेते शुकमर्यादाः।
Human beings are always pursuerers of pleasure, to luster and me. Hence the sacred people have invoked Agni to protect from these things. The same sense has been expressed in Rg I. 185.4.

"Defend us, Heaven and earth from great danger. This mantra is an ample evidence of the fact that our Vedic seers were intelligent scientists knowing minted details about the creation and destruction of this universe. These seers were well acquainted with human nature.

Hence they suggest that man needs both wisdom and aptitude in order to understand the means of protecting the universe. Otherwise by his very nature he commits sin towards gods, friends and the creators. As human beings we require the essential things like. Food, water, air, shelter etc from nature to sustain ourselves, we have to pay in some form for enjoying the benefits of natural resources. That is why it is essential to protect the environment.

We come to know through the Rgvedic mantra that the Gods milk waters in all three worlds, namely earth, sky and heaven in order to draw energy.

अवशीत्यमुदु नू गृहायाक धर्मायम्यते।
अवीजन जाटु मनीषाय कशु श्रवण्यो अविदो मनीषाय।

Rg.V.83.10

Ecology – Its preservation and protection in Vedas
It has been addressed to the rain. “You have rained, now check well the rain, you have made the desserts capable of being crossed, you have made man to enjoyable and you have obtained to laudation from the people.

The gods milch the clouds in the air, for getting the rains in orders to fill the oceans and rivers on the earth. They milch the sea water in order to get clouds. So, the emphasis has been given to not to pollute the waters.

शुद्धा: आप:
आपे मा हिंसी

The fact is that polluted water brings disaster to human life. It is due to cosmic waters the universe is created. Elsewhere it has been said.

“जीवनम् शुद्धनम् जलम्”

8.15 Water inspires both living and non-living things.

Rain fills wells, lakes, reservoirs etc. which gives life to human beings on earth vedic seers talk of living hundred years of life with good health and strong sense organs. Thus

शतं जीव शरदो वर्षभानः
शतं हेमन्ताच्छत्रसु वसन्तानारः।

Regaining your strength, live for a hundred autumns, a hundred winters, a hundred springs.

कुर्ष्नेवेद कर्माणि जिजीविषे च्छतं समा: ॥ Yaju 40.2

Ecology – Its preservation and protection in Vedas
This sort of life expectancy is not possible if the natural resources are polluted. Pollution is a man made disaster. The best way to keep the air free from pollution is doing Agnihotras – daily rituals – sacrifices. This has been a proved one Dr. Agnihotri, he has treated TB patients at Jabalpur with this Nitya Agnihotra and there was enough success. Bhopal gas tragedy also can be given here as an example. The polluted air with gas leak did not affect those who practice Agnihotra rituals at their residences. Also it has been a proved thing that plague can be eradicated by performing a sacrifice using ghee, rice along with Kesar. Sun is also another most potential source of nature in keeping the atmosphere pollution tree. Sun is called the soul of all that moves and immovable.

“सूर्य आल्मा जगतस्तापुष्यव”

Rg.I.115.1

Rigveda says that sun keeps away all diseases particularly heart disease and Jaundice.

“अपांवीयों बापने”

Rg I.35.9

Sun dispels diseases.

“हृद्योगम मम सूर्य वरिष्ठ च नाशय” ॥

I.50.11

‘O’ Sun remove the sickness of my hearth and the yellowness of my body.
8.16 Water pollution and Vedas

To protect the earth, we must take care of our environment. For this, remove the congestion of all types. Let the rivers flow. Don’t pollute them. Let the fresh winds blow freely favorably. Let the birds move free and without fear.

संस्कृतैं सिन्धवं सं बालासं सं पतलिणिः

Av.I.15.1

The people should spend to keep the rivers deep and flow freely. Don’t allow their waters to be stagnant. It should always flow with the noise. Let their waters breath freely and healthily. Don’t throw any filth init. The stage says the health and wealth will flow rushing, like those waters of the rivers, and you will enjoy the life, if you let the rivers flow with their deep waters gushing and rushing forward.

षो हिंदोभासं सं स्वरति उत्साहं सदमक्षिताः
तेषसं अर्यं सं स्वाभं बनं संस्रावप्यामि

Av.I.15.3

The Vedic seers know that energy exists in *water*, hence they say, keep the energy and might of the *waters* thriving. Keep the trees and all types of vegetation growing freely. So increase their brilliance, strength and every thing to make peoples life healthy and wealthy. Pollution in air will remove the brilliance of trees and plants. Water pollution will damage the powers of waters to create energy and might.
Deep rooted plants and gigantic trees with numbers of branches remove pollution. They purify the atmosphere. Due to pollution, people suffer from sleeplessness, respiratory problems, irritation of eye and other allergies. The plants and creepers protect us day and high from heat and cold.

Deaths due to hunger or thirst are avoided by growing more trees. Pollution weakens the sexual potency. The plants and creepers will save us from this destruction. Pollution in water or food can be removed and all poisonous fumes and gases are controlled.

Water helps us in keeping our body in good health. Thus
May the divine water be propitious to our worship, for our drinking, may they flow around us and be our health and safety.

'श्रवणी श्रवणी नामु'

Rg.X.9.5

"Granters of habitations to men". The expression of preserving the clean water is reflected in the mantra

"आपो न देवीरिप यत्ति होत्तिरयथः  
पश्चाति विताने यथा रजः।।

Rg.I.83.2

Yajurveda says about the pure water—

अयक्ष्मा अननीय अनाग्न: ।

Yaju.IV.12

RgVeda says pure water only can save us—

शुच्य: पावकास्ता आपः देवीरिह मानवनस्तु ।

Rg.VII.49.2

In the Atharva Veda-----

अयक्ष्मं करणीरष: ।

AV.XIX.2.5

Here water has been praised to bring good health. "Best be the waters, auspicious waters, bringing good health."

To solve the problem of pollution, the most important requirement is the need for enforcing strict discipline. Discipline is the essence of life. Nature also follows certain discipline. For instance, water in the rivers flow down wards. Mountains remain still and steady. The occurrence of seasons throughout the year is regular. Any damage caused to nature not only harms the mankind but the whole living and non-living creation. Nature provides trees, herbs etc. We get oxygen from nature. Cutting
down trees for firewood and furniture, though useful to us, but more than that we lose the benefit of getting oxygen and other essentials. In Rgveda it is said that mountains remain steady due to fear of Indra. The heaven and earth are also afraid of Indra because Indra would punish them for any breach of law and order.

अस्येव भिया निरक्षयं दुःखः
धावा च भूसा जनुवस्तु जेते ।

Rg.I.61.14.

The whole universe whether visible or invisible, it has to follow certain discipline. Man must lead balanced and disciplined life in order to protect equilibrium. According to Vedas it is truth, which sustains the earth.

‘सत्येनेत्रविषता धूमि: ।

Rg.X.85.1

Mahabharatha also describes truth as the base of all activities of worldly life.

सत्यं धर्मस्तपो योगः
सत्यं ब्रह्म सततमः ।
सत्यं यथा: परः प्रोक्तः
सर्वं सत्यं प्रतिष्ठितमः ॥

Anusasanaparva

Ecology – Its preservation and protection in Vedas
The expressions like या हिंसा रायः अन्तरिस्त्र या हिंसा: clearly indicates that they have to be preserved as they are. This is possible only with knowledge and intellect. That is why the Vedic seers pray god to bestow them with intellect.

V.S.32.15

Intellectuals can distinguish perishable and non-perishable. They follow certain limits in life. Fools on the other hand want of earnings disturb the environment creating pollution. Pollution can be controlled by self-discipline. It we are really interested in solving the problem of pollution we should have control over the sense organs and desires.

Kathopanishad. I.3.3

Sense organs are to be controlled like horses of a chariot. Mind control the sense organs the same way as reins control the horses. Our soul is the owner of the chariot, the body is the chariot and the intellect is the charioteer. So, one has to control the sense organs in order get to satisfaction (आत्म तुष्टि). Individuals should live without selfishness for the sake of the others, for the sake of the nation and for the sake of the society as a whole.