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LIFE & ENVIRONMENT

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CHAPTER TWO
LIFE AND ENVIRONMENT

2.1 Introduction

Human life is very valuable. It is said that to make your life count, spend on things that count. Really, how true it is. That brings us to the core question first, as to what is life and what are the things that count in life. Also an important question that needs to be considered is what is the concept of life? Another question is what or where is the origin of life? When does life start? What are the things that have an impact on life? What are the things necessary to lead a quality life? What is quality of life? What is the role of environment in human life? Is the role benign or harmful? Does the quality of environment have any impact on human existence? Are the two concepts life and environment inter - dependent or separable?

These are a few questions which the researcher shall attempt to find an answer in this chapter. To begin with let us examine a few definitions of life laid down by scholars and philosophers.

2.2 Meaning of Life

Philosophically life has various connotations Herein few scientific definitions of life are discussed.[15]Although there is no universal agreement on the definition of life, the generally accepted biological manifestations are that life exhibits the following phenomena:

[15] The source of definitions is http:// en.wikipedia .org

2.2.1 Definition of life

1. Organisation: Living things comprise of one or more cells which are the basic units of life.
2. Metabolism -produces energy by converting nonliving material into cellular components (synthesis) and decomposing organic matter (catalysis) Living things require energy to maintain internal organization (homeostasis) and to produce the other phenomena associated with life.
3. Growth - Growth results from a higher rate of synthesis than catalysis. A growing organism increases in size in all of its parts, rather than simply accumulating matter.
4. Adaptation - Adaptation is the accommodation of a living organism to its environment. It is fundamental to the process of evolution and is determined by the individual's heredity.
5. Response to Stimuli - A response can take many forms, from the contraction of a unicellular organism when touched to complex reactions involving all the senses of higher animals. A response is often expressed by motion: the leaves of a plant turning toward the sun or an animal chasing its prey.
6. Reproduction - The division of one cell to form two new cells is reproduction. Usually the term is applied to the production of a new individual (asexually, from a single parent organism, or sexually, from two differing parent organisms), although strictly speaking it also describes the production of new cells in the process of growth.[16]

2.2.2 Exceptions to the Conventional Definition

It is important to note that life is a definition that applies at the level of species, so even though many individuals of any given

[16] Sources www.google.com.

species do not reproduce, possibly because they belong to specialized sterile castes (such as ant workers), these are still considered forms of life. One could say that the property of life is inherited; hence, sterile hybrid species such as the mule are considered life although not they capable of reproduction. It is also worth noting that non-reproducing individuals may still help the spread of their genes through such mechanisms as kin selection.
For similar reasons, viruses and aberrant prion proteins are often considered replicators rather than forms of life: they cannot reproduce without much specialized substrates such as host cells or proteins, respectively. However, most forms of life rely on foods produced by other species, or at least the specific chemistry of Earth's environment.

Viruses reproduce, flames grow, some software programs mutate and evolve, future software programs will probably evince (even high-order) behavior, machines move, and some form of proto-life consisting of metabolizing cells without the ability to reproduce presumably existed. Still, some would not call these entities alive. Generally, all six characteristics are required for a population to be considered a life form.

2.2.3 Other definitions[17]

The systemic definition is that living things are self-organizing and autopoietic (self-producing). These objects are not to be confused with dissipative structures (e.g. fire).
Variations of this definition include Stuart Kauffman's definition of life as an autonomous agent or a multi agent system capable of reproducing itself or themselves, and of completing at least one thermodynamic work cycle.

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[17] *Ibid.*

- Life science: where it is defined as the internal force of animals and plants.
- The religious: where life is considered as some kind of spirit that, for certain religious, in humans will not die with the body.
- Philosophy of life: where it will be the internal force of the beings that have it.

Life science limits the concept to animal and plants, while philosophy of life does not make that restriction. In other words, science will limit the concept unless there is a proof that other beings are alive; on the contrary, philosophy will not make any restriction unless there is a proof to do it.

Philosophies of life and evolution are **animal psychology (instinct as pseudo-concept), conductivism and etology**.

Philosophies of the human beings and their culture comparisons are **ethnocentrism, culture relativism and universalism**.

Theory of life is closer to the philosophical position called **vitalism** and I think that science should be neutral in the sense that we do not know exactly the nature and origin of life. Therefore, science should recognise its limits and declare that it is not clear if life is only related to animals and plants or if it is also related with any kind of energy or matter.

From a personal or internal point of view, we may realise that life without intelligence cannot exist, that intelligence without memory does not make sense. Also, for our nature, life without time or love is difficult to imagine. The same way, life with no freedom does not seem to be possible. All these concepts are sufficient and

necessary conditions of life, each one implies the others and vice versa.

2.3 Origin of life

There is no truly "standard" model of the origin of life, but most currently accepted scientific models build in one way or another on the following discoveries, which are listed roughly in order of postulated emergence:

1. Plausible pre-biotic conditions result in the creation of the basic small molecules of life. This was demonstrated in the Urey-Miller experiment.
2. Phospholipids spontaneously form lipid bilayers, the basic structure of a cell membrane.
3. Procedures for producing random RNA molecules can produce ribozymes, which are able to produce more of themselves under very specific conditions.

There are many different hypotheses regarding the path that might have been taken from simple organic molecules to protocells and metabolism. Many models fall into the "genes-first" category or the "metabolism-first" category, but a recent trend is the emergence of hybrid models that do not fit into either of these categories.

2.3.1 The possibility of extraterrestrial life

At this time, Earth is the only planet in the universe known by humans to support life. The question of whether life exists elsewhere in the universe remains open, but analyses such as the Drake equation have been used to estimate the probability of such life existing. There have been a number of claims of the discovery

of life elsewhere in the universe, but none of these have yet survived scientific scrutiny.

Today, the closest that scientists have come to finding extraterrestrial life is fossil evidence of possible bacterial life on Mars (via the ALH84001 meteorite). Searches for extraterrestrial life are currently focusing on planets and moons believed to possess liquid water, at present or in the past. Recent evidence from the NASA rovers Spirit and Opportunity supports the theory that Mars once had surface water.

Jupiter's moons are also considered good candidates for extraterrestrial life, especially Europa, which seems to possess oceans of liquid water.[18]

Other highly speculative and somewhat doubtful places for present or past life include the atmosphere of Venus, Titan cryovolcanoes, or even Enceladus

2.3.2 Biological Evolution of Life

The term of biological evolution is really not clear, especially when we are talking about the **purpose driven life**. An important idea about the definition of evolution and life is if the changes that **biological evolution** implies are internal changes or only external.

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[18] Kauffman, Stuart. The Adjacent Possible: A Talk with Stuart Kauffman. Retrieved Nov. 30, 2003 from

- Lynn Margulis and Doris Sagan - *What is Life?* (1995). Simon & Schuster
- Erwin Schrodinger - *What is Life?* (1944 to 2000). Cambridge University Press (Canto).

The problem comes from the idea that the internal genetic modifications are random, so the real biological evolution is only external and due to the elimination of the non efficient changes. This idea is not only incorrect and not proven but it changes the definition of evolution and the **concept of life** itself.

There is only one clear concept of evolution and it is the changes in the living beings or in the things. Another matter is if those changes are permanent or not.

Related to the alteration of the **definition of evolution** is the aspect of short and long term evolution. The idea of natural selection needs the long term to operate, so the biological evolution in the short term is eliminated

Pre-Cambrian stromatolites in the Siyeh Formation,Glacier, National Park. In 2002, William Schopf of UCLA published a controversial paper in the scientific journal *Nature* arguing that geological formations such as this possess 3.5 billion year old fossilized algae microbes. If true, they would be the earliest known life on earth.[19]

2.3.3 Current models of the origin of life

There is no truly "standard" model of the origin of life. However, most currently accepted models build in one way or another upon a number of discoveries concerning the origin of molecular and cellular components for life, which are listed in a rough order of postulated emergence:

1. Plausible pre-biotic conditions result in the creation of certain basic small molecules (monomers) of life, such as amino

[19] www.google.com

acids. This was demonstrated in the Urey –Miller experiment by Stanley L. Miller and Harold C. Urey in 1953.

2. Phospholipids (of an appropriate length) can spontaneously form lipid bilayer, one of the two basic components of a cell membrane.
3. The polymerization of nucleotides into random RNA molecules might have resulted in self-replicating *ribozymes* (RNA world Hypothesis).
4. Selection pressures for catalytic efficiency and diversity result in ribozymes which catalyse peptidyl transfer (hence formation of small proteins), since oligopeptides complex with RNA to form better catalysts. Thus the first ribosome is born, and protein synthesis becomes more prevalent.
5. Proteins out compete ribozymes in catalytic ability, and therefore become the dominant biopolymer. Nucleic acids are restricted to predominantly genomic use.

The origin of the basic biomolecules, while not settled, is less controversial than the significance and order of steps 2 and 3. The basic inorganic chemicals from which life was formed are methane (CH_4), ammonia (NH_3), water (H_2O), hydrogen sulfide (H_2S), carbon dioxide (CO_2), and phosphate (PO_4^{3-}). As of 2004, no one has yet synthesized a "protocell" using basic components which has the necessary properties of life (the so-called "bottom-up-approach"). Without such a proof-of-principle, explanations have tended to be short on specifics. However, some researchers are working in this field, notably Jack Szostak at Harvard. Others have argued that a "top-down approach" is more feasible. One such approach attempted by Craig Venter and others at The Institute for Genomic Research involved engineering existing prokaryotic cells with progressively fewer genes, attempting to discern at which point the most minimal requirements for life were reached.

The biologist John Desmond Bernal, in coining the term Biopoesis for this process suggested that there were a number of clearly defined "stages" that

could be recognised in explaining the origin of life.
Stage 1: The origin of biological monomers
Stage 2: The origin of biological polymers
Stage 3: The evolution from molecules to cell

Bernal suggested that Darwinian evolution may have commenced early, some time between Stage 1 and 2.

Research into the **origin of life** is a limited field of research despite its profound impact on biology and human understanding of the natural world. Progress in this field is generally slow and sporadic, though it still draws the attention of many due to the gravity of the question being investigated. A few facts give insight into the conditions in which life may have emerged, but the mechanisms by which non-life became life are still elusive.

2.4. Concept of life

2.4.1 History of the concept of life: Aristotle, Pasteur, Darwin, Oparin

The oldest records of human activity and technology, pebble tools, have been found with human bone remains in various parts of Africa in the Stone Age. As the Stone Age progressed the tools became more and more sophisticated, more varied and more effective. Greater exploitation of plant and animal resources became feasible. However it is important to note that stone may not have

been the only material used by early civilizations. Sticks and animal bones may also have been used.

From its first formulation by Aristotle in the 4th century BC it was an article of both common and learned belief, at least in Europe, that complex living organisms arose spontaneously from non-living matter - fleas and adult mice from dirty laundry and from piles of wheat, maggots and flies from rotting meat, aphids from drops of dew. Life, in short, came about by spontaneous generation, or abiogenesis. Holes began to be knocked in Aristotle's dictum by early biologists in the 18th century, but not until the meticulous experiments of Louis Pasteur in 1862 was it finally established that a truly sterile medium would remain forever sterile, and that complex living organisms come only from other complex living organisms. The "Law of Biogenesis", (omne vivum ex ovo or "all life from an egg") based on his work is now a cornerstone of modern biology.

The modern science of abiogenesis addresses a fundamentally different question: the ultimate origin of life itself. Pasteur had proved that abiogenesis was impossible for complex organisms. Charles Darwin's theory of evolution put forward a mechanism whereby such organisms might evolve over millennia from simple forms, but it did not address the original spark, as it were, from which even simple organisms might have arisen. Darwin was aware of the problem. In a letter to J.D. Hooker of February 1, 1871, he made the suggestion that life may have begun in a "warm little pond, with all sorts of ammonia and phosphoric salts, lights, heat, electricity, etc. present, [so] that a protein compound was chemically formed ready to undergo still more complex changes". He went on to explain that "at the present day such matter would be instantly devoured or absorbed, which would not

have been the case before living creatures were formed." In other words the presence of life itself prevents the spontaneous generation of simple organic compounds from occurring on Earth today - a circumstance which makes the search for the first life dependent on the laboratory.

The answer to Darwin's question was beyond the reach of the experimental science of his day, and no real progress was made during the 19th century. In 1936 Aleksandr Ivanovich Oparin, in his "The Origin of Life on Earth", demonstrated that, *pace* Pasteur, it was the presence of atmospheric oxygen, and other more sophisticated life-forms that prevented the chain of events that would lead to the evolution of life. Oparin argued that a "primeval soup" of organic molecules could be created in an oxygen-less atmosphere, through the action of sunlight. These, he suggested, combine in ever-more complex fashion until they are dissolved into a coacervate droplet. These droplets, he suggested, "grow" by fusion with other droplets, and "reproduce" through fission into daughter droplets, and so have a primitive metabolism in which those factors which promote "cell integrity" survive, those that don't become extinct. All modern theories of the origin of life take Oparin's ideas as a starting point.

2.4.2 Scientific Concept of life

Science has a enormous tendency to attribute random reasons to the unknown facts or effects without any kind of proof. It could be possible that energy or light has very little degrees of freedom, so little that we can not measure or detect its free behaviour. We could say a similar comment about killing or eating plants, we do not detect they suffer but it makes sense that they do not like to die.

The concept of life in itself it is not relevant for the GTCEL in its scientist aspects, but the **wide concept of life** helps to understand this theory. The concept of life is related with the concept of evolution but Darwin did not define life; in fact, he talked about evolution of the species and not about evolution of life. To reduce the evolution of life to pure chance is almost to kill its real concept of freedom and possible **purpose driven life.**[20]

The definition of 'human' is something of a problem, not least because, as it is the case with all existing organisms, new forms tend to emerge by perceptible degrees from antecedent ones. Moreover the fossil evidence is scarce, fragmentary and can rarely be dated with the precision. To qualify as a human, a hominid must demonstrate cultural development: the systematic manufacture of implements as an aid to manipulating the environment.

The physical existence of life originates from an egg and protoplasm. In the case of microscopic creatures, life is generated from inorganic matter. By generation of life into the molecules then it would tend to be oxidisied to carbon dioxide, nitrogen and water. As living beings they consume any prebiological organic matter from the biosphere.

Scientifically speaking, the duration between the commencement of generation of air, water and energy and its creature is the 'life span' of a living being. But in real terms the true meaning of life depends upon one's concept of living. It is said that to make your life count, spend on the things that count.

[20] Jose Molina .Globalisation and Scientific Revolution

2.4.3. Philosophical Concept of life.

What one understands by concept of life determines the life style. In any civil society, the concept of life is affected by various factors like culture, population, natural calamities, wars, ethnic conflicts, civil strife and terrorism. If we look generally, the Western or the occidental world is being viewed as a materialistic world and the oriental World is viewed as spiritual world. We find the westerners coming to the East in search of spiritualism.

Man with his inquisitive qualities, wishes to know every thing , must know his own concept ,without his knowledge of other things would be imperfect. Knowledge of life is so desirable to man as a securely based condition to critically justify his existence on earth. Life is an end in itself and the only question, as to whether it is worth living , is whether one has enough of it.[21]

The concept of life as viewed by Arthur T. Vanderbilt, an American Jurist, is:

"Life has never been completely charted and as long as change is one of the great facets of life, it never will be; and always remember, is but one aspect of life."[22]

2.5 Concept of Environment

The term **'environment'** etymologically means surroundings. Literally, it is an English word formed by two words, i.e, **'environ'** and **'ment'** which mean 'encircle' or 'all round'. The environment is

[21] Holmes , Oliver Wemdell as quoted by Henrey Commager in the New York Times, Nov.20,1980.

[22] Concept of Life; a Report on Pre-Legal Education, New York University Review, Vol.25. April 1950

not just pretty trees and tigers, threatened plants and ecosystems. It is literally the entity on which we all subsist, and on which the entire agricultural and industrial development depends Thus environment is a complex of many variables which surrounds man as well as living organisms. Any external force, substance or condition, which surrounds and affects the life of the organism in way becomes a factor of its environment. These factors have been variously called as environmental factors, ecological factors or simply factors and may be **living, biotic**, as well as **non-living, abiotic**. The sum of all these living and non living factors makes the environment of an organism.

Universal Encyclopedia defines environment as **the sum total of all conditions, agencies and influences which affects the development, growth, life and death of an organism or race**
The **Encyclopedia Britannica** defines environment as **"The entire range of external influences acting on an organism, both the physical and biological (in other organism) forces of nature surrounding an individual.**

2.5.1 Meaning of Environment

The whole earth and its parts i.e land surface, water bodies, atmosphere as well as living organisms are working in an integrated system, which not only directs but also determines the pattern of life and is also an indicator of environmental relationship with the living organisms. This integrated system can be termed as ecosystem. The term eco system was coined by **A.G Tansley** in 1935 who defined it as **"The system resulting from the integration of all the living and non living factors of the environment."** He further stated that **"the whole system includes not only the organism complex but also the whole**

complex of physical factors forming what we call the environment of the biome- the habitat factors in the widest sense. It is the system so formed which – are basic units of nature on the face of the earth."

Eco systems are ecological systems in which plants and animals are linked to their environment. **Strahlar** has defined ecosystem as **"The total assemblage of components entering into the interactions of a group of organism."** He further elaborated that "To the geographer, eco systems are the part of physical composition of the life layer."

Eco system has also been defined as a unit that includes all the organisms (biological factor) in a given area interacting with the environment (physical factors) so that a flow of energy leads to a clearly defined trophic (nutrient requiring) structure, biotic diversity and material cycles (i.e exchange of materials between living and non living sectors)[23]

In fact our earth has a giant eco system in a form of biosphere, where abiotic and biotic components are constantly acting and reacting on each other, brings forth structural and functional changes in it.

Ecology is the science of the intricate web of relationships between living organisms and their living and non-living surroundings. The inter-dependent living and non-living parts make up eco-systems. Forests, lakes and estuaries are examples. The earth, its surrounding envelope of life-giving water and air and all its living things comprise the biosphere. Man's total environmental system

[23] Encyclopaedia Britanica Vol.III ,1980 p.780

includes not only the biosphere but also his interactions with his natural and manmade surroundings.

The stability of a particular ecosystem depends on its diversity. The more interdependencies in an ecosystem, the greater the chances that it will be able to compensate for the changes imposed on it. Environment is the source of life on earth and it not only directs but also determines the existence, growth and development of mankind and all its activities. Mankind has long trusted in nature's potential and restorative powers, though earlier there was no reason to believe that these powers were inexhaustible. The human environment is the earth we live on. It includes all the physical parts of the earth, such as air, soil, minerals, rocks, and water, and all its living organisms, such as animals and plants.

2.5.2 Environmental factors

Environment is a complex phenomenon of several factors which are the product of the forces and processes of nature, Environmental factors are classified into two groups as. **Direct factors and Indirect factors.**

4 **Direct factors** are light, temperature, soil, air, water, soil nutrients etc.

5 **Indirect factors** are soil structure, soil organisms, altitude, wind, slope etc. According to **Oosting, an ecologist, the** environment is a complex of variable factors or causes which include

- **a. Substances (soil and water)**
- **b. Conditions (temperature and light)**
- **c. Forces (wind, gravity)**
- **d. Organisms (plants and animals)**
- **e. Time**

Daubenmire an ecologist, classified these factors into seven coordinate headings as

a. **soil**
b. **water**
c. **temperature**
d. **light**
e. **atmosphere**
f. **Fire**
g. **Biotic factors**

Others have grouped these elements as follows:

I. Climatic or aerial factors.

II. Topographic or Physiographic factors.

III. Edaphic factors.

IV. Biotic factors.

Generally the natural environment of any part of earth surface can be classified into following fourteen elements.

A. Abstract elements.including, Location 2. Situation
3. Geometrical position
4. Size or aerial space
5. Form

B. Physical elements.

1. Physiography/Land forms
2. Climate
3. Rocks and minerals
4. Soils
5. Surface waters of the land
6. Underground water
7. The ocean and its coasts

C. Biotic elements

1. Natural vegetation
2. Animal life

2.5.3. Environment as found in the Religious Scriptures[24]

In India, nature is worshipped as God since ancient times. Environment finds special mention in the scriptures of various religions. Religion has an impact on the way of life. It enriches the quality of life.In eastern religions and philosophies, the significance of eco-balance is far more recognized than in any other major religion of the world. The ancient Indian literature is full of obeisance to nature. Ozone layer depletion was foreseen by our rishis and that is why when they sang the song of Shanti (peace), they also said, "Om, Peace to the Ether."

2.5.3.1 Hindu Religion

Hindu thought gravitated toward belief in an inner, unseen, abstract reality, underlying the manifest world disclosed by senses. For man (and other living things) it was Atman, spirit or inner self, in contrast to the body. More expansively and abstractly still, all things in the divided, articulate world disclosed to the senses are manifestations of inner being, Brahman. Atman and Brahman in turn are to be conceptually united so that the inner Being or essence of all things is soul, spiritual being, or consciousness. Objective Knowledge and subjective knowledge thus coalesce. To know one's self, not ones personality or empirical self, but ones transcendental self, is to know the nature of all things.

[24] Source:Desai Ashok A., Environmental Jurisprudence,Vikas Publishing House Pvt.Ltd ,1988

The empirical world is important, but unreal, since it seduces the soul into illusion. It distracts the soul from finding itself, attaining liberation, and merging with the one essential, transcendental Self. Other forms of being , particularly other forms of life are victims of the same deceit , frustration and suffering as oneself and should be empathied. Indeed there is no real distinction between self and other. One cannot thus profit at the expense of others, either other human beings or other natural, environmental beings since ultimately there are no others all are ephemeral manifestations of one indivisible being. Lastly there is correspondence between the ecological world view and the world view of Hindu thought. Ecology also represents the world as a unity, that is, holistically- the unity of oneself and one's surroundings. Thus, there are two major elements in Hinduism which contribute to the development of a universal environmental ethic: empathy and compassion regarding all living things and a sense of harmony with the environment, therefore, its protection and enhancement.[25]

2.5.3.2 Atharvaveda

Atharvaveda tells us about earth and its unity. It is a prayer to the earth to forgive, if man does any harm to her. It considers all that exists in nature as part of a single soul, Parmatman. And thus earth and all that it contains – soil, air, water, animal life, plants etc- are interrelated. It covers three environmental dimensions:

1. To depollute the environment to sustain life on earth;
2. To bring peace in the universe; and
3. To use prayer as a means to improve the welfare of the society. Every element of nature is considered to be a

[25] Extracts from Connect, a UNSESCO Publication

source of strength. We cannot afford to pollute it. We must protect the nature to protect ourselves.

2.5.3.3 Koran

According to Islam, all human beings are descended from Adam and Eve. Hence all human beings regardless of race, colour, or national origin, are equally members of one extended family; no people are privileged or chosen; no one is inherently better than anyone else. In Islam, moreover, there is a strong emphasis on justice. Justice, indeed, is one of the cornerstones of the Moslem region. Since environmental abuse and/or destruction are, more often than not, harmful to people they are a form of injustice. To ruin or destroy the environment is tantamount to either bodily injury or the destruction or theft of property or both. Further, ignorance of the complex or delayed effects of action in the environmental arena is no excuse, since Islam stresses the moral importance of knowledge , no less than of justice. These are all truly elements of an environmental ethic with universal implications.

According to the Koran God sent man as His heir. The inheritor has certain responsibilities. God's creation cannot be destroyed by his heirs, the human beings. They were not given the right to destroy or spoil it. Trees flowers, fruits are to be used but within limits. Similarly animals can also be used by man but he has to remember that they (animals) don't disappear from the earth because of overexploitation. In the Koran, there is the story of Toofan-e-Nooh in which the protection of various species of animals is mentioned. Islam permits use of nature, but only within limits.

2.5.3.4 Christian Scriptures

According to Christian scriptures, God created everything. He is supreme. Human beings in the Book Genesis have been called the pride of creation. But man has been created with other creatures. He can use nature, the living as well as non-living, but only with Vivek (discrimination and wisdom). Man has not been given the right to destroy nature. It is in the preservation of nature that lays the welfare of man. Adam named every animal, bird and plant. It does not mean that he got mastery over them.

There are two separate creation myths is Genesis: (1) The account which begins (rather than ends) with the creation of Man and the Garden of Eden in a single day and is centuries older than (2) the account which begins with the creation of light and of division of waters on the first day and ends with the creation of man on the sixth. The order, even more ambiguous, myth also is subject to two conflicting interpretations about the proper role of Man in relation to Nature. It is in this myth that one finds that the role assigned to man by God is to dress Garden of Eden (which might be interpreted to mean Nature as a whole) and keep it. This injunction together with Man's naming the animals and thus establishing a kind of power over them and prerogative respecting them suggests the kind of responsible, benign vice-regency of stewardship interpretation.

There are, well, three possible environmental ethics consistent with the Judeo- Christian worldview, depending upon its interpretation: (1) an indirect anthropocentric, utilitarian environmental ethic associated with mastery; (2) a more direct biocentric environmental ethic associated with citizenship. While both the environmental ethics associated with stewardship and citizenship are direct and

biocentric, they differ in their practical implications. The former would permit benign management of Nature and wise use while the latter would imply a laissez, live- and let live approach, incompatible with the present more positive attitude toward environmental protection and improvement. The environmental ethic associated with stewardship is thus both the most practical and the most acceptable interpretation consistent with the Judeo- Christian tradition. Further, since it is a possible interpretation of the role intended for Man by God in both the creation myths of genesis , it seems the most plausible interpretation of the overall gist of the text as it has come down to us, and its most effective contribution to a universal environmental ethic[26].

2.5.3.5 Jainism

In Jainism, more than in Hinduism or Buddhism, one finds an explicit environmental ethic. Jainism, in contrast to the core philosophy of Hinduism as discussed, is dualistic rather than monistic. There is fundamental dichotomy between soul and body, mind and matter. Each soul, moreover, maintains its own integrity. It is not a manifestation of the universal soul. Every living thing is endowed such a soul. And although in each living thing the soul is, as it were crusted over with flesh and its consciousness dimmed and confused with sensory perception of various modes and degrees of clarity, all souls are equally pure and perfect in and of them.

At the **moral core of Jainism** is the **doctrine of ahimsa, the determination not to kill or harm any living thing which contains soul as perfect or complete as ones own and which is liable to suffering on oneself.** The Jains are famous for the

[26] *ibid.*

extreme lengths to which they go to honour this doctrine. Mahavira, the founder of Jainism, himself ate only leftover food, prepared for somebody else, so as not to have caused personal injury even to the plants, or their seed, from which it was made.

2.5.3.6 Buddhism

Buddhism stems from the teachings of Siddartha, the Gautama, who lived in India during sixth century B.C. Buddhism; however, today flourishes less in India than in countries to the south and east of India namely, Sri Lanka, Myanmar, Thailand, Kampuchea, Laos, Vietnam, China, Korea, Japan, Tibet and Mongolia.

Core moral values in Buddhism is to be found in the five precepts: **abstention, from killing living creatures, abstention from stealing, abstention from lying, and abstention from taking intoxicants.** While these precepts embody the basic requirements for the living of good life and the establishment of a good community, some of them are relevant to a conservationist ethic. The respect for life and property, the rejection of hedonistic life-style and the notion of truthfulness emphasize consistency in thought and action are all ethical premises relevant for the development of environmental ethics.

The Buddhist precept concerning abstention from killing living creatures focuses attention on the ethical premise concerning the value of life. Buddha asked people to abstain from destroying the life of human beings and animals and also condemned the infliction of suffering and pain on living creatures. He was also critical of the pleasures of hunting. The kings were expected to provide protected territory not only for human beings but also for the beasts of the

forests and the air. The principle of ahimsa, non harming and non injury to life was a concept found in Jain the Jain and other Indian sects and the Buddha (though he did not go to the extremes of the Jains) was alive to the concept and preached against taking life. All this shows great feeling of sympathy for living creatures.

What can be inferred from the philosophy of Buddhism is a pro-conservationist (sound management) conception towards nature, which is critical of an aggressive attempt to exploit the environment for short-term benefits and generate gigantism, and a life-style based on limitless consumerism. In short, a non-violent and gentle attitude towards nature, animals and fellow people provides the essence of the environmental stance- the environmental ethic- of Buddhism.

Reviewing the foregoing traditional cultures and religions to find what they have in common with regard to humanity's relationship and responsibility vis-a- vis the environment- in other words, the common ingredients of a universal environmental ethic- is the historic role of environmental education. An ethical attitude toward the environment personally and professionally, individually and collectively, and universally valid, is both the assumption and the goal of this new great field of education, making EE the principle, indispensable instrument for its development.

2.6 Concept of Life and Concept of Environment: Interrelation

Humans are part of nature. They can manipulate nature and ignore its laws of balance only to the extent that the life-sustaining capability of nature is not destroyed. Modern man armed with

modern science and technology, has tried to exploit nature to an extent that its life-sustaining capability is jeopardized, and endangering the very survival of life on earth. Now the important question is, whether an individual have an unfettered right to exploit nature? Each individual has an equal right to live on earth, but he also has to see that he does not destroy nature, nor does he use more than what legitimately belong to his share.

Humans grow in the lap of nature and receive sustenance from her. The basic needs of human beings are met by her gifts. Human life plant life and animal life are all inter linked. Yet humans have been abusing other forms of life; which reflects the short sighted ness of human beings. It has been seen that industrial development has frequently undermined the natural environment. Unfortunately the crisis today is not only what humankind is doing to the environment but also what the environment is doing to mankind. Humans are faced with air pollution, water pollution, diminished wildlife, the hazards of radiation and polluted vegetation. Their health and prosperity are undermined.

Overgrown human interference is disapproved by Nature. And gradually it starts withdrawing its benevolence. The advancement of science and technology has adversely affected integrity of human spirit. Justice Krishna Iyer has observed if technology inflicts injuries on nature, mankind becomes the first victim. Jean Rousseau stated similar proposition way back in 1750 itself. He maintained "Arts and science has brought corruption to mankind. Be that as it may truer it is that Arts and sciences brought environmental corruption[27] .Today the development has brought deprivation. Today an imbalance in the environment has been

[27]Chaturvedi R.G. and Chaturvedi R.M. Laws on Protection of Environment and Prevention of Pollution. Pp1

created. Today it's high time that we capture the old teaching of oneness of mankind. The earth can support only a limited biomass. However today the human beings, due to increase in population have usurped the biomass, which was being used by other living creatures also. That is why so many living creatures have just disappeared from the earth's surface and many more are endangered.

It is estimated that we exterminate one species every 15 minutes. Biologically, the microorganisms are more important than the bigger organisms. Microorganisms multiply at a very high rate. For example, the bacterium divides itself into two within 20 seconds it does not die. A single bacterium multiplies into 15000 within five hours. Any discharge of waste is thus decomposed by bacterium very fast. There are no bacteria in nature to decompose plastics and nuclear wastes. Thus we are destroying the biodiversity.

With the march of imperialism, the notion of self-possession or acquisition became more organized. Colonial rulers, disregarding ancient prudence, cultivated ruthless intelligence to exploit nature. On alien land rulers had no bondage to maintain with environment. Further as a legacy of imperialism and colonialism, while conceiving a sense of ownership over environment, man held environment as a property conveniently available at his disposal for consumption. Rule of nature was replaced by a phenomenon "to rule nature". Law of nature was noticed only in its breach.

A Study on the World Conservation Strategy has revealed:
"Forty per cent of humid tropical forests which constitute the richest resources of the planet's natural environment have already been destroyed. Nineteen per cent of the land surface of the planet is danger of becoming a desert. Humid

coastal zones and shallow areas of the seas and oceans, where two-thirds of all the world's fish reproduce are being degraded or destroyed as a result of the extraction of sand and shingle, as well as the burying of the waste and the dumping of polluting matter"[28].

Yet another study done by S. N. Jain has similar alarming results. He reports:

Water technology experts have estimated that large parts of India will go without water by the years 2025A.D.[29]While the Centre for Science and Environment reports that on an average, every hectare loses 20 tonnes of top soil every year which in turn destroys good crop. Thereby plants lose the nutrients.

The many environmental problems that India faces may be summarized as follows.

1. Continuous degradation, in varying degrees, of productive land (due to increased salinity and alkalinity, desertification, water logging and deforestation.)
2. Shortage of wood fuel and fodder for rural needs , which jeopardizes existing forests
3. Depletion of the forest cover, which in turn threatens the survival of indigenous biodiversity and affects wildlife habitat
4. Excessive and unwise use of pesticides and fertilizers and ill-advised agricultural practices which further stresses the fragile environment Poorly monitored and inadequately enforced environmental regulations for various natural resource activities

[28] Inaugral Address on Waste Management by Justice Krishna Iyer. Pg.4

[29] Jain: "Poverty, Environment, Development:: A view from Gandhi's window." EPW,13.2.88,p.311

(such as mining, metallurgy, aggregate production and other manufacturing industry)[30]

When human societies were space-bound and local, not global, man-nature relations were governed by sets of ethical values. But today, "think globally and act locally", has become a universal slogan of the environmental movement. It implies a universal environmental ethic towards which, we are slowly moving. Though in the present global world those environmental ethical values have gone there is a need to resurrect them, may be in new forms and in conformity with the current state of cultural progress. A comparative study of environmental cultures and ethics across the borders of time and space would be of help in this regard.

The human impact on natural environment is one of the issues that have attracted the attention of the scientists and geographers alike. The relationship between man and environment can be studied under various heads like human impact on vegetation, soil, climate and atmosphere, animals, waters and geomorphology.

2.6.1 Human Impact on Vegetation

The human impact on vegetation is greater than on any other components of the environment. The nature of the whole landscapes has been transformed by human induced vegetation change.

The extent of human influence on vegetation is provided by **Westhoff** in the following four part scheme:

[30] Dwivedi O.P Dharmic Ecology (An article) in Hinduism and Ecology , The Intersection of Earth, Sky and Water, edited by Christopher Key Chapple and Mary Evelyn tucker. Pp.3

Natural – a landscape or ecosystem not influenced by human activity.

Sub-natural - a landscape or ecosystem partly influenced by humans , but still belonging to the same formation type as the natural system from which it derives.

Semi-natural – a landscape or ecosystem in which flora and fauna are largely spontaneous, but vegetation structure is altered so that it belongs to other formation type such as pasture, moorland etc.

Cultural- a landscape or ecosystem in which flora and fauna have been essentially affected by human agencies in such a way that dominant species may have replaced by other species in case of arable land.

Humans are known to have used fire since Paleolithic times. Through all ages the use of fire has perhaps been the most important skill to which man has applied his mind .Fire gave man a diurnal creature, security by night from predators. The fireside was the beginning of social living, the place of communication and reflection. Man has utilized fire for a variety of reasons like to clear forests for agriculture, to improve grazing land for domestic animals, to deprive game of cover' to drive game from cover in hunting 'to kill or drive away predatory animals, ticks, mosquitoes and other pests, to repel the attacks of enemies for cooking, to expedite travel to burn the dead, to provide light, to transmit messages, to break-up stone for tool- making etc.

The deliberate removal of forests or deforestation is one of the long standing and significant ways in which humans have modified the environment, whether achieved by fire or cutting. In fact, a human

activity have become a prime cause for the gradual removal of forest cover in many parts of the world and has become a main cause of the degradation of the environment.

2.6.2 Human Impact on Soil

Soil is the most vulnerable of human resources and is one on which humans have had a very major impact, because they live and depend on the soil. It is one of the thinnest and most vulnerable human resources and is one upon which both deliberately and inadvertently, humans have had a very major impact. Natural soil is the product of a whole range of factors and the classic expression of this is that given by Jenny.[31]

$$S=f(cl,o,r,p,t,...)$$

Where **S** denotes any soil property, **cl** denotes the regional climate, **o** the biota, **r** the topography, **p** the parent material, the time (or period of soil formation) and the **dots** represent additional, unspecified factors .The effects of these factors are both beneficial and detrimental to the soil. For eg. The Parent material adds mineral fertilizers, removes excess amount of salt etc but at the same time it is detrimental to the quality of soil as it alters soil constituents in a way to depress plant growth. Sometimes these create environmental problems such as water pollution, while their substitution for more traditional fertilizers may accelerate soil structure deterioration and soil erosion.

Although soil erosion is a natural process but at the same time it is also the result of human activities. Myers , an eminent ecologist has summarized the scale of accelerated soil erosion that has been done

[31] Jenny H. 1941, Factors of soil formation. New York: McGraw Hill

by human actions:' since the development of agriculture some 12000 years ago , soil erosion is said by some to have ruined 4.3 million sq km of agricultural lands or an area equivalent to rather more than one third of today's cropland- the amount of agricultural land now being lost through soil erosion in conjunction with other forms of degradation , can already be put at a minimum of 200,000 sq. km per year.)

Salinity is a natural characteristic in some semi-arid and arid soils. But humans have increase the extent and degrees of salinity in different ways .Another important aspect is the extension of irrigation and the use of a wide range of different techniques for water abstraction and application can lead to a build-up of salt levels in the soil through the mechanism of raising ground water so that it is near enough to the ground surface for capillary rise and subsequent evaporative concentration to take place. Construction of large dams and barrages to control water flow and to give a head of water creates large reservoirs from which further evaporation can take place.

In coastal areas salinity problems are created by over pumping. This can be explained as follows. Fresh water has a lower density than salt water, such that a column of sea water can support a column of fresh water approximately 2.5 per cent higher than itself (or a ratio of about 40:41) So where a body of fresh water has accumulated in a reservoir rock which is also open to penetration from the sea, it does not simply lie flat on top of the salt water but forms a lens, whose thickness is approximately forty one times the elevation of the piezometric surface above sea level. This is called the **Ghyben-Herzberg** principle. The corollary of the rule is that if the hydrostatic pressure of the fresh water falls as a result of over pumping in a well, then the under lying salt water falls will rise by

forty units for every unit by which the fresh water table is lowered. This is presenting a problem in various parts of the world where ground water tables have dropped.

Human activities are also responsible for the structural changes in the soil. There are many ways in which humans can alter this, especially by compacting it with agricultural machinery and by changing its chemical character through irrigation Grazing is another activity that can damage soil structure through trampling and compaction. Soil drainage is a slow and gradual process and is responsible for certain environmental changes and also a cause for long term damage to soil quality.

Further the process of construction, urbanization, mining etc. are also accelerating the problem of soil erosion though the prime causes being deforestation and agriculture.

2.6.3 Human Impact on Water

Water is the source of life. And right from origin of life, human beings are using it for various purposes. The ancient civilizations have developed in river valleys. The main concern is that by using water, humans have influenced both quantity and quality of the environment. Earlier the influence of human activity on water resources was limited but now this has become a major problem of environmental degradation throughout the world.

Deforestation is a human activity that gives rise to floods. Studies have shown that deforestation could create torrents and floods. [32]

[32] Perera , H.C., 1973, Land Use and Water Resources In Temperate and Tropical Climates . Cambridge, Cambridge University press

Environmental consequences of this phenomenon include ground subsidence and soil salinity. (which has been discussed earlier).

Water pollution is common problem. The causes and forms of water pollution created by humans can be classified into following groups

1. Sewage and other oxygen demanding wastes
2. Infectitious agents
3. Organic chemicals
4. Other chemical and mineral substances
5. Sediments
6. radioactive substances
7. Heat

Apart from the above mentioned several other factors can also contribute to changes in water quality like agriculture, fire, urbanization, industry, mining, irrigation etc.

2.6.4 Human Impact on Climate and Atmosphere

Biogeochemical Cycling

"The chemical elements, including all the essential elements of protoplasm, tend to circulate in the biosphere in circular paths from environment to organism and back to the environment." These move in a more or less circular path, known as *biogeochemical* cycles. The growth of life processes requires about 40 elements. Hydrogen, carbon and oxygen are the basic elements while nitrogen; phosphorous, Potassium, Calcium, Sulphur, magnesium and iron are the other important elements.

Carbon Cycle

Carbon cycle is very important for man. The small amount of carbon dioxide (CO2-0.03 per cent) in the atmosphere is the only source of all carbon that passes through the organism along the food chains. As shown in the fig, carbon moves from atmospheric pool to green plants (producers), then to animals (consumers) and finally to bacteria and other micro-organisms (decomposers) that return into the atmosphere, through decomposition of dead organic matter. The carbon dioxide has the unique property of absorbing infrared radiation and its small quantity helps in keeping the earth warm. A part of this cycle also operates in the ocean.

Oxygen Cycle

The oxygen cycle constitutes 21 per cent of the atmosphere. It also occurs in a bound state as oxides and carbonates in rocks and in water. The plants release oxygen in photolysis of water during photosynthesis . Again, gaseous oxygen is used in respiration of all the organisms and in the oxidation of the organic matter. Another phase of the oxygen is the ozone layer of the outer stratosphere which serves an important function of protecting the life from the ionizing ultra violet waves.

Nitrogen Cycle

Nitrogen is an essential element of all forms of life and in atmosphere; its percentage is 79.But Nitrogen is never taken directly from the atmosphere. The chief sources of nitrogen for the plants are the nitrates from the soil. During the cycle, the reduced and oxidized forms involved at one or the other stage. The chief symbiotic nitrogen fixers are bacteria belonging to the genus

Rhizobium found in the root nodules of legumes, while asymbiotic nitrogen fixers are blue-green algae. Plants in turn are eaten by animals. The dead organic matter formed due to death of plants and animals is decomposed by bacteria fungi, etc. which releases nitrogen either in a free state to atmosphere or ammonia gas. Ammonia gas may also reach the soil as nitrates through the activity of nitrifying microbes.

Phosphorous Cycle

This is sedimentary cycle. Phosphorous, an important and necessary constituent of protoplasm tends to circulate the organic compounds being broken down eventually to phosphates which are again available to plants. The green reservoir of phosphorus is rocks or other deposits which have been formed in past geological ages. These erode and release phosphates to ecosystems. A major portion of phosphates goes into the sea in the form of sedimentation. Sea birds also have a role in returning phosphorous to the cycle from sea to land. The general pattern of phosphorous cycle is more or less similar to that of other minerals.

Sulphur Cycle

The sulphur cycle links air, water and soil, where microbes play an important role. The reserve pool of sulphur is the soil. It is made available to the plants in the soil by the activity of sulphur bacteria. Some quantities are added to the atmosphere by the burning of fossil fuels .Later sulphur dioxide and hydrogen sulphide return to the soil as sulphates or sulphuric acid. In tissues of organisms, sulphur is in the form of proteins. The decomposition of proteins releases sulphur.

Hydrological Cycle

It involves interchange of water between earth's surface and the atmosphere through rainfall and evapotranspiration. The water from the water bodies like oceans, lakes, rivers etc, gets evaporated by solar energy. These water vapours after cooling and condensation form clouds, result in rainfall, snow fall etc. A large part of rainfall occurs over oceans and a sizeable part of water vapour goes back to the oceans via rivers and streams. Some part of it infiltrates into the soil to become soil or underground water. A small quantity of water is released during respiration and transpiration of plants. Thus there is a continuous cycling of water.

The climate of the world is known to have fluctuated frequently and extensively in the three or so million years during which humans have inhabited the earth. The increasing human population and the rising level of technology both have become significant factors in the variations in the world climate and are responsible for the various changes in atmospheric conditions as well as air pollution. Human influence on global climate can be summarized as follows:

Gas emissions
CO2 – industrial and agricultural
Methane
Chloroflurocarbons(CFCs)
Nitrous oxide
Krypton 85
Water vapour
Miscellaneous trace gases
Aerosol generation
Albedo change
Dust addition to ice caps

Deforestation
Overgrazing
Extension of irrigation
Alteration
Of ocean currents by constricting straits
Diversion of fresh waters into oceans

Now let us see in detail the impact of these possible mechanisms on the environment.

The problem of carbon dioxide emission has become a major environmental concern. Since the beginning of the Industrial Revolution humans have been taking stored carbons out of the earth in the form of coal, petroleum and natural gases and burning it to make carbon dioxide, heat, water vapor and small amounts of sulphur dioxide and other gases which are responsible for air pollution, green house effect, increase in surface temperature, or global warming. The prime cause of the release of CO2 into the atmosphere is probably the burning of fossil fuels. Fossil fuels burning throughout the world in 1981 released about 5.3 gigatons of carbon as CO2.

Another factor that may contribute substantially to CO2 levels in the atmosphere is the burning of forests and changes in the organic levels in the soils that are subjected to deforestation and cultivation.[33] Also the CO2 levels in the atmosphere have an effect on the global heat balance, since CO2 is virtually transparent to incoming solar radiation but absorbs outgoing terrestrial infra-red radiation that would otherwise escape to space and result in loss of heat from the lower atmosphere. This is called the green house effect.

[33] Wilson A.T.1978 , Pioneer Agriculture Explosion and CO2 levels in the atmosphere .Nature. 273

Other Gases

In addition to Carbon dioxide, it is probable that the other gases contribute to the green house effect. Individually their effects may be minor but as a group they may be major..[34] One of the important trace gases is methane. Chloroflurocarbons (CFCs), despite their relatively trace amounts in the atmosphere have increased very remarkably in terms of their emissions. Their concentrations in recent decades have a very strong greenhouse effect even in relatively small amounts.

Nitrous oxide (N2O) is also no laughing matter for it can contribute to the green house effect, primarily by absorption of infrared at the 7.8 and 17um bands. Combustion of hydrocarbon fuels, the use of ammonia-based fertilizers, and deforestation are among the processes that could lead to increase in atmospheric N2o levels Krypton 85, substance emitted from nuclear reactors is also believed to be emitted whose increased the presence will reduce the electrical resistance of the atmosphere between the oceans and the ionosphere. This in turn would affect the electrification of thunder clouds and through that precipitation levels.

2.6.5 Human Impact on Geomorphology

Human beings also have been instrumental in modifiying geomorphological processes such as weathering, erosion and deposition the range of impact on both forms and processes is considerable. Haigh [35] has classified anthropogenic land forming processes as follows:

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[34] Ramnathan. v.. 1988. The greenhouse theory of climate change: a test by inadvertent global experiment. Science,240,293-9

[35] Haigh, M.J.. 1978 , Evolution of slopes on artificial landforms- Blaenavon, Uk. Research Paper 183,Dept of Geography, University of Chicago

2.6.5.1.1 Direct anthropogenic processes

- Constructional: tipping: loose, compacted, molten.
- Graded: moulded, ploughed, terraced

2.6.5.1.2 Excavational: digging, cutting, mining, blasting of cohesive or non cohesive materials catered tramped, churned

- Hydrological interference

Flooding, damming, canal construction, dredging, channel modification draining coastal protection

2.6.5.2 Indirect anthropogenic processes

2.6.5.2.1 **Acceleration** of erosion and sedimentation
Agricultural activity and clearances of vegetation, engineering, especially road construction and urbanization, incidental modifications of hydrological regime

1.0.0.0.0 **Subsidence** : collapse, settling, mining, hydraulic, thermokarst
1.0.0.0.0 **Slope failure**: landslide, flow, accelerated creep, loading, undercutting, shaking, lubrication
1.0.0.0.0 **Earthquake generation**: loading (reservoirs) , lubrication (fault plane)

2.6.6 Human Impact on Animals

The human impact on animals can be found in five broad based categories like domestication, dispersal, extinction, expansion, and contraction. The real problem is seen in the decline of certain animal species and its becoming rare day by day.

The percentage of the species that will become extinct in course of the next century – as a percentage of all existing species will reach double figures. Maintaining biodiversity is often functionally linked with the stability of ecosystem. It is high time that all these issues are given a serious thought and consideration.

2.7 Quality of Environment

Environment is the life support system of humanity. Clean, healthy and safe environment is a human right. Environmental ethics is a code of behaviour to protect this right. India is a country with ancient civilization and a long and glorious past. Now we are in the 21st century. The new century brings with itself its own challenges, problems and promises. One of the most important problems looming large over this century is environment protection and maintaining its quality, and constantly keeps a vigilant eye upon the impact of quality of environment on human beings. Justice Krishna Iyer has observed

"Our century, before it expires, has a choice to make. It faces Hamletian dilemma. To be or not to be: that is the question if we care or dare at least to frame the question and face the problem. I mean here not the nuclear terror in the hands of some of whom one holds mankind to horrendous ransom. Human survival is menaced by another equally homicidal missile euphemistically described as environmental pollution. The dehumanized industrialization, with all its profit – hungry vulgarity and its ecological insensitivity, invades nature without enlightened resistance from society and poisons or depletes all the resources of land, water and air, the crucification of the race a lot possibility unless we begin the battle for human

values against barbarity right now. Today is late; Tomorrow may be too late."[36]

Every society and each period in history has its own code of conduct, its own norms its own concept of desirable behavior. Our ancient scriptures, rituals, and celebrations that still form part of our lives reflect these ideals and values. The environmental codes are enshrined in our different religions and cultural practices. Any initiative that we take today in the field of environmental education must necessarily come from own cultural heritage. Living in harmony with nature is the recurrent theme of Indian culture.

2.8. Quality of Life

Clean environment determines the quality of life. The right to a clean environment has been recognized by the Indian judiciary as well as the International Covenants on Environment. They are discussed in detail in the subsequent Chapters. The International Covenant on the Economic, Social and Cultural Rights (1966) has certain relevant provisions on the right to healthy environment. Article 11(1) provides for the "right to an adequate standard of living ... and to the continuous improvement of living conditions." Article 12(1) of the Covenant entitles "everyone to the enjoyment of the highest attainable standard of physical and mental health"., the attainment of which is subject to the improvement of all aspects of environment and the International Declaration of Human Rights and the Covenant on Civil and Political rights in underling environmental health in relation to protection of life. The goal of attaining the highest standard of physical and mental health as envisaged by the Covenant can hardly be realized except by avoiding or mitigating environmental degradation.

[36] Iyer, V. R. Krishna (1984) : Environmental Pollution and the Law, Vedpal Law House, Bhopal. p.95

Life does not mean mere vegetative existence. It means something more than that. It means a dignified, respectable and a meaningful life. Life becomes meaningful only when one is allowed to bloom and prosper to ones' maximum potential. Only this can add quality of life. Quality of life is dependent on various factors and a healthy and wholesome environment is one of it.

There can be different styles of life, which have a fundamental inner attitude. Style of life indicates what "what part of oneself one judges, how one relates oneself to moral obligations, what one does to transform oneself into an ethical subject and what mode of being one aims to realize."[37]

The concept of standard of living is based on a universalistic approach while style of living is relativist. The Conflict with aesthetics is very serious. If the economic problem is solved, people can be expected to become more concerned about the beauty of their environment. From getting goods, people can be expected to go on to getting the surrounding in which goods can be enjoyed. But harmony between economic and aesthetic accomplishments cannot be assumed. They may be quite in conflict and in most cases they actually are in conflict. With rare and probably accidental exceptions, an aesthetically attractive environment requires that economic development take place within overall framework. Segregation of industry and commerce from living space is essential if the latter is to be agreeable. Nobody would like an asbestos factory or a steel mill established near his residence. This is in conflict with short- run economic priority. (Given the self-destructive character of much unplanned investment, the longer run conflict is not so clear.) Economic efficiency rightly accords the

[37] Davidson, 1994:71

greatest possible freedom for uninhibited use and uncontrolled dissonance. The economic organization strongly affirms its need for freedom. Proposals for control are pictured as subversive; concern for beauty is pictured as effete (feeble).

This need not necessarily be accepted. The priority of economic goals will, of course, continue to be defended. The vigour of defence may, rather, will, increase as people come to see the price they pay for it. But we must have the social control that establishes the necessary framework for the economic growth, earnestly and honestly. And we can have such control if we have the will to do so. A price in industrial efficiency must be assumed. But economic development enables us to pay the price; it is one of the advantages of development in order to make our surroundings more hideous and our culture more meretricious. Economists and economic policy makers must be instrumental in leading us to the detriment of the rest of the society. We must contribute to the good and happy life of all as far as practicable. As the Ishopanishad says

Isavasya midam sarvam yatkim ca jagatyanjagat
Tena tyaktena bhunjitha ma grudhal a kasyasvidhanam
*(A*ll that moves on the earth belongs to the Nature {the Lord} He who renounces truly enjoys; covet not other's wealth.*)*

Wealth is not an end in itself. It is simply a means and the *qu*ality of the people is the end. The quality of life would suffer if the individual, the man, is not the end, but an instrument of some purpose that is not his own. But if we have economic goals in proper perspective, we will question the desirability of such subordination.

If ethical considerations are neglected the quality of life decidedly would suffer. There is constant conflict between social well being and economic well being. In the simple pursuit of economic well being not even scientific truth much as our culture presumes to canonize it, is exempt. For eg.the tobacco industry has not yet ceased to reveal its discontent with scientists who on the basis of rather impressive evidence over that cigarette, khaini, Zarda and other forms of tobacco are a cause not only of lung and mouth cancer but a disconcerting assortment of many other fatal or disabling maladies. The economic well being of the tobacco industry requires the active and energetic recruitment of new customers.

Economic growth devoid of ethical considerations leads us to consumerism .And in a consumerist society we live surrounded by a systematic appeal to a dream world, which all mature scientific reality would reject; social distinction must be associated with a hair oil or mouth wash, improved health with a hand lotion. We quite literally advertise our commitment to immaturity, mendacity and profound gullibility. It is the hallmark of the consumerist culture. And it is justified as being economically indispensable.

Our attitude towards growth must also change. And so must change our development strategy. In recent years so many economists indeed have been developing countries and foreign assistance donors to economic growth. If growth is the main policy objective, they argue, income distribution and other equity issues cannot be ignored, widespread improvements in human welfare, that is development will thus occur slowly. Some environmental scientists fear that unchecked growth will make the earth unfit for human habitation not too many generations into the future.....[38].

[38] Zuvekas, 1979:388

With the rise in social awareness, the distribution of wealth will increase. Similarly, the concern of the environmentalists is also valid as it is connected with the quality of life and the quality of output. For if unemployment is deemed to be a dominant problem and expansion of the economy is deemed a complete remedy, it will not matter how much is achieved. Many measures may be adopted which should adversely affect the quality of life and may be simply immoral from the viewpoint of the greatest good of the greatest number of people would fail and no it would no longer be the dominant guiding factor in economic decisions. Economics cannot detach itself from ethical consideration if quality of life of the people becomes the goal of the economy of the economy and economic development. As Kautilya pointed out centuries ago ***sukhasya moolam dharmaha*** i.e the basis of happiness is the value of life- the more dutiful actions of men.

One of the most compelling problems that have arisen in business ethics in the last century has to do with the depleting of natural resources through careless overuse and the destruction of environment. Although people in business should not have to bear total responsibility for these problems, they must certainly accept a large share of it. In fact, now that these problems are so serious, businesses are truly blameworthy if they fight against viable solutions and do not do what they can to alleviate problems, which are either already present or which soon will be. Business, according to the environmentalists must take the major blame for environmental waste and destruction. Therefore, it must use its profits to reverse the damage it has brought. Furthermore, business, through advertising, has helped to foster the consumer-at- all costs mentality, which has been a major factor in creating these problems with the environment. Therefore, it must now attempt to re-educate the public in any way possible, even if this

means loss of profit. Even if business is destroyed and the economy is damaged, these actions must be forced on business in order to change present situation before it becomes irreversible.

2.9 Quality of life and Quality of Environment: Interdependence

Human personality can not be divided into watertight compartments. All the aspects of life, historical, economic, political, cultural, social, ethical and religious act upon one another in bringing progress. If we expect society to comprise righteous persons, then an individual will have to be righteous in all his capacities and in all walks of life. His righteous behaviour need be general and not selective. Though it is predominantly the domain of ethics to persuade men to do the right things, other social sciences including economics cannot altogether free themselves from ethical considerations.

Count Buffon can be regarded as the first Western scientist to be considered directly and intimately with the human impact on the natural environment.[39] He has contrasted the appearance of inhabited and uninhabited lands. He has stated that the anciently inhabited countries have few woods , lakes or marshes , but they have many heaths and scrub :their mountains are bare and their soils are less fertile because they lack the organic matter which woods ,felled in inhabited country supply and the herbs are browsed.

Studies of the torrents of the French and Austrian Alps undertaken in the late eighteenth and nineteenth centuries deepened

[39] Glacken 1963

immeasurably the realization of human capacity to change the environment. The extent of human influence on the environment was not however, explored in detail and on the basis of sound data, until George Perkins Marsh published 'Man and Nature' in which he dealt with human influence on the woods, the waters and the sands.

Charles Lyell in his **Principles of Geology**, one of the most influential of all scientific works, referred to the human impact and recognized that tree-felling and drainage of lakes and marshes tended 'greatly to vary the state of the habitable surface.' Overall however he believed that the forces exerted by people were significant in comparison with those exerted by nature.

The subject of the human role in changing the face of the earth received relatively little attention from geographers in the nineteenth century and early decades of the twentieth century. By taking energy and matter from the environment and returning them in converted – industrial, domestic and other forms of society interferes with the dynamically balanced cycles of natural processes. However, as a result of its long evolution, nature has acquired an ability to restore disrupted natural processes. Thus the natural environment taken as a whole was able, up to a point, to withstand anthropogenic disturbances, although there were also irreversible changes. Since the industrial revolution, the general intensity of human impact on the environment has exceeded its potential for restoration in many large areas of the earth's surface, leading to irreversible changes not only on a local but also on a regional scale.

Clearly, the growth of the human population of the earth is in itself a highly important cause of the transformation of nature of no

lesser importance, however, has been the growth and development of culture and technology. Man's unique power to manipulate things and accumulate experience presently enabled him to break through the barriers of temperature, aridity, space, seas and mountains that have always restricted other species to specific habitats within a limited range. Within the cultural devices of fire, clothing, shelter and tools he was able to do what no other organism could do without changing its original character. Cultural change was, for the first time substituted for biological evolution as a means of adapting an organism to new habitats in a widening range that came to include the whole earth.

A cursory glance at the extent of some of these major environmental problems reveals that all India's environmental issues are inter connected and together constitute an increasingly deteriorating environment and rapid depletion of natural resources – whether the issue in question is health hazards caused by water and air pollution, population pressure and urbanization straining the resources of local governments that have to provide various civic amenities , the dearth of which perils the quality of life of people living in urban areas. The use of hazardous chemicals to meet today's short term needs without an eye to future costs is extremely dangerous to the quality of life of the people. Similarly the rapid shrinkage of timber and firewood from the forests place the quality of environment at high stakes. And India also faces the problem of poverty coupled with population explosion. The existence of poverty affects the meager natural resources that India wishes to protect and conserve.

Air is an important part of environment. Air pollution undermines the quality of life and gives rise to several diseases and respiratory problems. Polluted atmosphere where noxious gases are released

into atmosphere disrupt the equilibrium of the carbon cycle . The nitrogen cycle too is disrupted through repeated use of chemical fertilizers and pesticides. Man is destroying the chloroflurocarbons and at the same time man is also cutting down the trees that are needed to absorb the ever increasing quantities of carbon dioxide released into the atmosphere by our industrial activities.

Due to industrialization space has become congested in urban areas. Noise pollution levels too are alarming giving rise to psychological and physical ailments.

In this chapter a study was made between the concept of life and the concept of environment. Also the emphasis was upon the quality of life and quality of environment. It is found that all are intermingled and interdependent. There is a close relation between the quality of life and the quality of environment. The quality of life is very much dependent on the quality of environment. In the foregoing pages, we have seen the excerpts and teachings from the various religions. All of them had embodied the environment related provisions. And religion is a way of life. Religion can be said to be one of the ways to enrich the quality of life. One can safely say, that even by observing religious teachings one can protect the environment and contribute to the maintaining its quality.

We have seen the theory of evolution of mankind. The mankind after it evolved was to live in nature, i.e.to the natural environment. However, before the mighty environment, human beings had no independent entity. They continued their existence as an indivisible part of nature. Creation of earth, magnificent environment and its numerous wonders were beyond the perception of mankind. That developed in him a sense of the existence of a Super Power, as creator and regulator of earth and all the plants and living

creatures. The most fascinating concept of God thus came into being. Human being owed their creation and existence to that super power.

And gradually with the passage of time and the advent of industrialization, the mankind started exploiting nature for its benefit resulting in the gradual downfall of the environment. And this started disturbing the delicate balance of nature. And in the preceding pages of this chapter, the researcher has given a detailed note on the impact of mankind on the soil, air, vegetation etc. All these has done nothing but only spoiled the quality of environment. And the quality of life is dependent on the quality of environment. This is an important truth which the entire humanity cannot forget, or rather, I should say, does not afford to forget. In the forth coming chapters, the researcher will try to establish how quality of life can be achieved and quality of environment can be maintained through the principle of sustainable development.

Unless the laws relating to nature are backed by a set of values which do not see man as enemy of nature, but as part of nature, the current environmental problems will continue to grow and intensify in future. It is very clear now that human beings should protect nature and save it from the jaws of death. The right to use nature can be enforced only within two ethical obligations. **First,** people do not use more than their share of the resources and **secondly** they give back to nature that which maintains its life-supporting delicate balance. Man has to remember that all that the earth has is earmarked for man. And hence man has to make a mindful use of environment.