ARCHITECTURE OF ECOTOPIA: A STUDY OF CONTEMPORARY FICTIONAL AND NON-FICTIONAL NARRATIVES FOR DEVELOPMENT OF SELF SUSTAINING COMMUNITIES

(Thesis submitted to Nagaland University in partial fulfilment of the requirements for the award of the Degree of Doctor of Philosophy in English)

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DECLARATION

I, Silpirekha Pandit, hereby declare that the subject matter of my thesis entitled *Architecture of Ecotopia: A Study of Contemporary Fictional and Non-Fictional Narratives for Development of Self Sustaining Communities*, is the bonafide record of work done by me and that the contents of this thesis did not form the basis of the award of any previous degree to me to the best of my knowledge to anybody else, and that the thesis has not been submitted by me for any research degree in any other university or institute.

This is being submitted to the Nagaland University for the degree of Doctor of Philosophy in English.

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CERTIFICATE

This is to certify that the thesis entitled ***Architecture of Ecotopia: A Study of Contemporary Fictional and Non-Fictional Narratives for Development of Self Sustaining Communities***, is a bonafide record of research work done by **Ms.Silpirekha Pandit, Regn.No. 690/2015**, Department of English, Nagaland University in partial fulfilment of the requirements for award of the degree of Doctor of Philosophy in English, this thesis has not previously formed the basis for the award of any degree, diploma, associateship, fellowship or other title and that the thesis represents independent and original work on the part of the candidate under my supervision. This is again certified that the research has been undertaken as per UGC regulations 2009 and the candidate has fulfilled the criteria mentioned in the University Ordinances-OC-4. Sub-section 5(i) of the Section-9 for submission of the thesis and UGC regulations amended upto 2016.

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PREFACE

The energy crisis, the growing understanding of our limited resources and some major technological failures required a fresh look at our '**Culture of Building**', because we are not dealing merely with the art or technology of making buildings, we are also involved in the totality of the 'human-nature' relationship. This relationship is needed at all scales. The sense of scarcity redefines the Architectural Profession. Architecture is confronted by immense challenges; there is an urgent need to solve major problems such as housing for large groups of people, preserving the quality of our environment, creating diversified urban settings and regional contexts, preservation of historic heritage and values, sustainable industry and tourism, to mention but a few. It would seem that our efforts, thus far this century, at solving these problems have been mainly inadequate. The challenge for our generation and the ones that follow, is not only in creative problem solving but in designing an arena for the '**Creation of a New Vision in Architecture'.**

The aim of this research is to study and analyse the ideals against ecological utopia of our cities in current global scenario and develop a sense of community, which is self- sustainable and analyse some significant fictional and non-fictional works in the area. The main objectives of the study are to explore the globalization scenario and its impacts in settlement patterns, to analyse the values and principles of a utopian society, to study the traditional Indian and European patterns of sustainable community living and to design a vision for a new self-sustaining society with the ecotopian values. From this ecotopian literary theories, a new understanding can be developed in Architecture, of what constitutes community in the global village as

our habitat. This shall provide a fresh perspective on planetary resources and planning in the 20th and 21st centuries. The assumption is true and more of the same may be experimented in the days to come.

The scope of work includes the analysis of various Utopian writers such as Ernest Callenbach and Murray Bookchin, the analysis of vernacular models by William Morris, the garden communities designed by Ebenezer Howard, and finally the values and modes of sustainability of the traditional Indian Vastu Shastra. The limitations of the thesis is that the study is a theoretical framework based on certain parameters.

The area of research is limited to built spaces, building materials and technology, which shall help in sustainability. The select fictional and non-fictional works have been analysed by close text reading method of New Criticism, for assessment of the works by using eclectic theoretical perspectives with special attention to eco-critical and architectural theories. Conflict theory seeks to scientifically explain the general contours of conflict in society: how conflict starts and varies and the effect it brings. The central concern of conflict theory is the unequal distribution of scarce resources and power. The APA citation methodology is being followed according to the Publication Manual of the *American Psychological Association, 6th ed.* (Washington: APA, 2010). Materials of Primary and Secondary sources are collected by visiting libraries and if necessary by contacting individuals.

Chapter I consists of the introduction to the topic with reference to the present environmental concerns and the conditions for development of a self-sustaining community. The chapter deals with the definition of an ideal society or utopia and the formation of ecological utopias in the society. The ecologically oriented utopia deals with a wide variety of sustainable and holistic issues related to urbanization and community development and illustrates how they could be addressed ideally and practically. In Ecotopia ecologically compatible high-technology exists, besides materialistic lifestyles and attitudes of its citizens. Environmental paradigms include: intergenerational justice, sustainability, steady-state economy, prices of goods that reflect anti-consumerism, slowly declining population, and strict environmental laws. The ecocentric worldview gives preference to the quality of life not to the economic paradigm of growth. This research analyses Ecotopia's measures in urbanization and community development for future sustainable and holistic development, especially in the light of the fast growing major cities in Asia. The eco-centric worldview gives preference to the quality of life not to the economic paradigm of growth. The eco-centric model frames ideologies by which economic growth shall happen if the environmental statistics remain intact, as then there will not be any harm to the health, no intake of polluted air and less exhaustive natural resources. Thus this can be termed into a new terminology called ***'Environomics'***.

Chapter II deals with the ecotopian model described by Ernest Callenbach and explains that environmental ethics are preserved through this ecotopian models. Ernest Callenbach, the author of the books *Ecotopia*(1975) and *Ecotopia Emerging* (1981), utopias of an awakening paradise in the Pacific Northwest that developed a

cult following as a harbinger of the environmental movement. The philosophy of Ecotopia is based upon a strong belief in living in balance with nature. Every action taken has to been in accordance to the notion of the stable state –this is the first mission of Ecotopia. The concept of stable state is built upon the idea that nothing produced in Ecotopia should have an impact on the well-being of the nature; everything should be recycled and reused. This concept has implication for every aspect of life, from the personal to the most general. The chapter also compares the various environmental ethics provided by the regious texts and how *Ecotopia* is influenced by the traditional systems as well and thus helps in eco-friendly living and preservation of the environment.

Chapter III deals with Murray Bookchin's theory of social ecology and describes the anarchical ideas on localized, self-governed communities which are particularly insightful today, as the strains of globalization and resource depletion has made thinking-local a viable plan for future societal sustainability.

Chapter IV deals with the concepts of Architectural Ecology by Ebenezer Howard and William Morris. Ebenezer Howard's idea of urban decentralisation, zoning for different uses, the integration of nature into cities, green-belting and the development of self-contained new town communities called 'garden cities' outside crowded central cities laid the groundwork for the entire tradition of modern city planning. Howard's theory was inspired by the crafts theory initiated by William Morris. William Morris' *News from Nowhere* (1890) is a classic work combining

utopian socialism and soft science fiction. The book contextualises a society where there is no private property, no big cities, no authority, no monetary system, no divorce, no courts, no prisons, and no class systems. This agrarian society functions simply because the people find pleasure in nature, and therefore they find pleasure in their work. The book explores a number of aspects of this society, including its organisation and the relationships which it engenders between people. But with growing urbanization, today these garden cities are largely middle class commuter towns. At the present context, the principles of collective land ownership, long-term stewardship and land value capture for the benefit of the community could not be more relevant now. But it requires strong political leadership. Development in this country is led by short-term local politics and dominated by volume house-builders, whereas garden cities do not begin to pay back until twenty or thirty years later. Hence the Fabian society can be the ultimate result combining crafts society and garden cities. The theory of Morris and Howard, both reflects the ideas of the Fabian society. Thus their utopias can be termed as '***Fabiopia'.***

Chapter V deals with the eco-ethical modes of the Indian *Vastu* Literature. The designs of *Vastu Shastra* are based on integrating architecture with nature and ancient Indian beliefs utilizing perfect geometric patterns, symmetry and directional alignments. The chapter includes analysis on construction techniques, town planning methods, and how efficient villages, towns and kingdoms integrated temples, water bodies and gardens within them to achieve harmony with nature. The important dimensions of development are a steady improvement in the material as well as infrastructural circumstances of all citizens, towards greater health, comfort and leisure, with better economic, educational and vocational opportunities; a city that

moves towards greater self-reliance and provides opportunities for its citizens to enhance their capability in securing development of themselves and their human settlements. Thus the parameters for sustainable development are fully in continuance to the principles of the traditional Indian *Vastu Shastra*.

Chapter VI deals with the causes of environmentalism and how utopian theories could be applied to urban areas for creation of self-sustainable communities. Suburb and edge-city developments all over the world and in India especially continues to erode forest and farms, disrupts hydrological patterns and weaken the overall ecological integrity of the region. Fragmented landscapes and equally fragmented communities isolate citizens from nature as well as from one another. Alternative approaches and models for creating sustainable communities are urgently required. A model sustainable edge community is analyzed and it is being concluded with the assertion that sustainable development is attainable and improves community's civic sense and quality of life tremendously. For this the area selected is *Deepor Beel* and its surrounding, which shall then be analyzed to create a sustainable community. It is concluded with the belief that the policies and guidelines proposed for the development of self-sustainable community shall act as a model to serve similar such urban areas for the overall preservation of the environment and the ecosystem as a whole.

Silpirekha Pandit

CHAPTER I

INTRODUCTION

1.1 INTRODUCTION TO ECOTOPIA:

The industrial revolution in Europe some 250 years ago set in motion fundamental changes in the social organisations and as a whole the natural system of the whole world. The new modes of production altered the balance between the manufactured goods and the natural resources which are the life support system for humanity. Consequently it appeared as a serious rift between the social norms of an ancient society and the ethereal aspirations of an architecture based on modernistic ideas. The great industrial machine had started to produce too much. In order to generate larger and newer markets to absorb this production, a whole new industry was generated for advertising. As the power and scope of advertising gained momentum, there was a new relationship generated between design method and the processes of construction. This relationship relies no more on common-sense principles of availability of indigenous materials, techniques, and traditions, but on the assessment or creation of market demands which could manipulate visible reality and address the fantastic. However, along with production there was also the generation of waste. This waste became more and more difficult to manage and started to pollute the natural environment on which life on the planet was dependent. As a consequence of this globalisation and its negative effects, a new awareness spread worldwide. The gigantism which marked the heroic period of modern architecture has been put to question and a new respect has been developed for the ecosystems which sustain the natural balance and ensure survival of life on this planet. This awareness is primarily based on ancient societies with a worldview on a

primitive respect for the ecosystem and to retain the ecological balance. The awareness has brought about Utopian models of cities or communities for the ecological survival.

'Utopia' may be either a historical or a literary concept, or both. Utopia, in historical concept, is an experimental community intended to reform or escape from normal human society, often by substituting planning, cooperation, or collective values and practices in place of laissez-faire, competition, and individualism.

The term 'Ecotopia' is a derivation from the combination of 'ecology' and utopia'- a portmanteau word. The word is made up of Greek parts, formed either from 'ou' (no) + 'topos' (place) to mean 'no place,' which is imaginative of a world of highest quality and order that never existed before, an ideal world. Ecotopia means Ecological Utopia, a community whose collective health is based on a close imitation of nature's interconnectivity. The term Ecotopia, a contraction of Ecological Utopia appears to have been coined by anarchist writer Murray Bookchin (Bookchin, 1982, p.14). However, it is the novel of that name '*Ecotopia*' (Callenbach, 1975) which has assured its popular hold on wider ecological society.

It has become increasingly evident in the last few decades that the future of human civilization is very clearly linked with our ability to find a new balance between systems of production and the preservation of natural and social systems.

Ecotopian literature features the world-view of the early vernacular societies. It emphasizes two fundamental principles that necessarily underlie an ecological world-view. The first is that the living world or ecosphere is the basic source of all benefits and hence of all wealth, but will only dispense these benefits to us if we preserve its critical order. From this fundamental principle, follows the second, which is that the over-riding goal of this behaviour pattern of an ecological society must be to preserve the critical order of the natural world of the cosmos.

Ecotopia is symbolic of a perfect habitat of peaceful living and stands for the restoration of the organic integrity of nature, the spirit of ecotopia as a centre for the environmental movement– the effort to restore the integrity of organic nature against the late stage of the self-destructive forces of industrial society. Ecotopia is an interesting concept, first formulated by Ernest Callenbach in his two works: *Ecotopia* (1975), and *Ecotopia Emerging* (1981). Utopia means no-where, a fancifully imagined ideal reality, as in Plato's *Republic* (381 BC) and Thomas More's *Utopia* (1516). Ecotopia is not anywhere; the 'u' is supplanted by 'eco', from the Greek, *oikos*, the word for household or home.

The ecologically oriented utopia deals with a wide variety of sustainable and holistic issues related to urbanization and community development and illustrate how they could be addressed ideally and practically. In Ecotopia, the utopian society described in *Ecotopia* (1975), ecologically compatible high-technology exists, besides materialistic lifestyles and attitudes of its citizens. Environmental paradigms include:

intergenerational justice, sustainability, steady-state economy, prices of goods that reflect anti-consumerism, slowly declining population, and strict environmental laws. The eco-centric worldview gives preference to the quality of life not to the economic paradigm of growth. The eco-centric model frames ideologies by which economic growth shall happen if the environmental statistics remain intact, as then there will not be any harm to the health, no intake of polluted air and less exhaustive natural resources. Thus this can be termed into a new terminology called '***Environomics***'.

1.2 URBANIZATION:

Urbanization is an important factor of economic change, inducing the breakdown of the feudal order and making society more towards a higher social formation. During the early phases of industrial growth and expansion, urbanisation did fulfil three major economic roles by inducing labour shift from agrarian areas to the expanding urban industrial areas: absorbing surplus labour from the agricultural sector and increasing labour productivity, diffusing technological innovation from the above centres across space, creating conditions for the development of non-industrial sectors. Cities associated with such processes were generators of economic growth and known as generative cities. Town and city exist not only on their individual productive base but also on the basis of mutual exchange of goods and services between the city on the one hand and the rural villages on the other (Ramachandran, 2013, p.4).

But factors of transition and convergence did not give rise to similar patterns in industrial and less developed countries because of the differential roles of capitalist development in these countries, which got intrinsically associated with the expansion of urbanisation. Due to the difference in resource and population distribution in the policies followed by the government, and also due to diverse historical relationships with international capital, the cities of the less developed countries could not fulfil similar roles as done by their counterparts in the Western world in the 19th century. As such, the development pattern in spaces in these countries became uneven as also the urbanisation pattern, evident in the differentials among core cities, smaller urban and rural areas. The rapid rate of urban growth or voluminous rural urban migration expressed only a false analogy of form, but the process remained different. Poverty and deprivation became the common elements of spatial formations within these cities.

The inexorable process of urbanisation has become extremely dominant, significantly changing the parameters of development by impacting social, economic and environmental sustainability. The phenomenon is intrinsically linked and irrevocably intertwined with the development process, simultaneously creating inequalities of various kinds within populations and regions. The divide between centres and the surrounding rural areas become sharper with advancement in economy and thereby, city growth. Urban areas are often equated with high development and rural with low development.

Urbanisation has in the past three decades exposed the weaknesses of infrastructure and urban spatial characteristics of towns and cities. The recent perceptions of the role of the city as an industrial centre providing employment to the unemployed, as a growth point stimulating development in its hinterland and as a Utopia for the rural poor and those afflicted by natural or man-made calamities, have brought in their wake myriads of problems which the cities are unable to cope with. The proliferation of slums, the inadequacies of city transport, the rising land and property values, the legendary insufficiency of water and electricity, are all manifestations of changing circumstances in urban areas (Ramachandran, 2013, p.19).

The urban growth of metropolitan cities has also brought about the spatial spread of urban areas. Cities have expanded into the adjoining rural areas in a haphazard and unplanned manner. There is a reverse flow of people from the city to the countryside. The agricultural lands of the peripheral villages are converted for industrial and residential use. To these newly developed areas, the city folk migrate in search of better and cheaper accommodation. These areas often do not have basic urban amenities such as piped water supply and sewerage. However, they are outside the ambit of municipal taxes and regulation, and this act as an incentive for new housing construction. Urbanization of the metropolitan fringe is a recent phenomenon, only a couple decades old. It is essentially an outgrowth of metropolization, but nevertheless, different from it in terms of the nature of migration and its concomitant problems. Thus large cities in these countries, due to their rapid population growth and concentration of economic activities, have become more a foci of environmental pollution and extracting points of regional resources

rather than promoters of diffusion of growth. They essentially perform a parasitic role in the process of regional development. Degradation of the environmental surfaces thus started as a concomitant pattern of such urban growth, both inside the cities and in the surrounding rural areas. Thus urbanisation can be termed as a **social process.**

The process of development can be fruitful only if all the available natural resources and human resources are wisely and thriftily used, rigorously conserved, rapidly regenerated and thoroughly renovated, without upsetting the currently prevailing ecological balance within a geographical region, and also can be termed as an **environmental process**.

The Indian subcontinent shares, with Mesopotamia and the Nile alley, a long history or urbanisation. The causative factors behind urbanisation varied from time to time, leading to not one but several urbanisation processes at different points in time. In the prehistoric period, urbanisation was synonymous with the origin and rise of civilisation itself, thus manifesting itself essentially as a cultural process. In the historical periods, from ancient times to the British period, urbanisation was inextricably related to the rise and fall of kingdoms, dynasties and empires, and thus in effect urbanisation during this period can be termed as a political process. In recent times, urbanisation has been associated with industrialisation and economic development. In this sense, urbanisation essentially can be termed as an **economic process**.

1.3 TRADITIONAL SYSTEM:

Indigenous knowledge (IK) and traditional knowledge are terms that describe knowledge specific to a given culture or society (Warren and Rajasekaran, 1993, p.63). According to the traditional system of economic development, sustainable growth entails continuous production of wealth along with *pari-passu* conservation of natural and human resources as per the ancient Indian doctrine of *yoga-ksema* (Dayal, 1970,p.140). While modern science and more efficient technology can only lead to higher production levels, so also sustainable growth and development of an economic process can only be achieved by adopting the traditional view of production cum conservation of the available natural and cultural endowments and equitable distribution of the same for the welfare of all.

In human geography, a community or a social group, traditionally occupying a certain well defined territorial space, usually depends upon the environmental resources available from the surroundings and upon the constraints prevailing within its habitats for its sustenance. The material cultures, comprising agricultural practices, indigenous industries, handicraft products, art expressions, technological attainments, solar usages etc. of social groups are intimately related to the set of environmental parameters within which a society is placed as a functional entity.

Habitat, economy and society are intimately related to each other in an extremely complex format peculiar to all higher order organic systems. View of animals as culturally, socially or economically significant objects sees non-humans as

facilitators of technological advancement (e.g. medical experiments or genetic manipulation of plants), as an attribute of cultural practice (e.g. hunting or whaling), or as the objects of economic interest (e.g. animal trade), or symbolic ritual (e.g. animal sacrifice), or collateral damage (e.g. road kill or forest clearings). Given the fact that biodiversity protection is not always contingent with economic interests, and because people can be materially sustained by monocultures (Crist,2003, p.65), anthropocentric view of non-humans leads to the abandonment of species that are not seen as useful for humanity. Our habitat, with all its environmental nuances, coupled with ecological checks and balances and maintains the health of our society. At the same time, the extant society too, through its tentacles of diverse economic and social actions, must necessarily have to protect and nurture the entire environment prevailing with its habitat. Otherwise the society cannot sustain itself long enough, nor can the habitat remain habitable for a great length of time. A successful society is prone to follow a natural growth path opened up by a set of technological attainments, cultural traditions and ethos, which have developed within the limited conditions prevailing in an environment. Therefore, to adopt any new developmental alternative in any area, we have to look deep into the already established traditions first, with a view to striking at the most suitable or the most appropriate technological option for bringing about a planned growth of the culture and economy and thus in turn the overall development of any social group.

A society cannot remain static for any length of time. According to the fundamental law of nature, everything in this phenomenal world of ours must undergo change along with the passage of time and with the shifts occurring within the spatial

organisations in different parts of the globe. But for a really sustainable growth, the society has to carefully regulate the change to ensure the desired level of social and economic development takes place along the right direction as generally set forth through local logical ingenuity and long standing traditions. The keyword for economic and cultural growth of a society lies in deliberately buildings up a truly benign habitat with its entire diverse member species properly fitted into the entire milieu in a sort of organic holistic system. While the environment undoubtedly nourishes our societies within the given habitats, the human social organisations also have the bounded duty, not only to conserve and protect the available environmental resources, but also to enhance the same so as to make the habitat an increasingly better place to inhabit for the human species as well as all other member species throughout the years to come.

People must strive hard to develop and conserve all available natural resources for the survival of the entire society. All our common natural wealth- whether at the local, regional or global levels, have literally been usurped and over-exploited by unholy means over many centuries from now. As a result of this unhindered exploitation of common resources, the earth is fast being denuded of its natural endowments, especially those that are non-renewable. The environment is getting defiled more and more by hazardous chemicals and the waste discharges of modern times. If this trend of environmental degradation continues, the world is going to be a totally unliveable planet in the near future.

1.4 ENVIRONMENTAL CRISIS IN THE 21ST CENTURY:

Energy is the crucial currency of the modern era. An indubitable requirement of a growing economy like India, energy is the lifeblood of manufacturing, transport, construction, communication and mobility. Wars have been fought, countries subjugated, governments overthrown and established to literally fuel global demands for energy.

The post industrial revolution demand for fossil fuels has strained our planet's ecological health. The damage caused by burning the vast quantities of carbon based fuels needed to run our development engines and modern economies as well known now. There are increasing atmospheric temperatures, melting glaciers, rising sea levels, changing rainfall patterns, failing agriculture, drought, floods and rampaging rivers, health detriments, deteriorating quality of life and economic costs of pollution from fossil fuels.

The rising demand for power associated with simultaneous growth of urban centres and modernising rural areas is placing a huge burden on our coal-based energy sector. While current power plants are creaking under the strain, alternative sources like hydropower or wind seem to have limited scope for large scale power generation in a country where land is tightly contested. Some renewable energy modes also come with attendant environmental and social costs if poorly planned.

The fossil fuel era is coming to an end. By 2050, oil and natural gas will be prohibitively expensive. They will no longer be used as fuels, but will be reserved as feedstock for chemical synthesis. It has been predicted that by 2050 the world's population of humans will reach 9 billion. This is just the moment when the oil and natural gas, on which modern energy-intensive agriculture depend, will become so expensive that they will no longer be used as fuels. Climate change may also contribute to a global food crisis. Melting of Himalayan glaciers threatens the summer water supplies of both India and China. Rising sea levels threaten to inundate low-lying agricultural land and aridity produced by climate change may reduce grain harvests. Furthermore, ground water tables are also falling. Topsoil is being lost. All these elements combine to produce a threat of widespread famine by the mid of 21st century.

The nature and extent of global environmental problems have been discussed fully in many texts, so they will be dealt with only in summary here, and only where they have some bearing on the development of sustainable urban form and structure. One major threat to the quality of life is pollution, which can, in part, be related to the ways in which cities are structured and used. Atmospheric pollution includes damage to the ozone layer, acid rain and the greenhouse effect. Depletion of the Earth's stratospheric ozone layer allows dangerous ultraviolet light from the sun to penetrate to the surface of the planet. This increase in radiation has the potential to cause adverse effects upon plants, animals and human beings. Acid rain can do immense harm, particularly to forest areas.

1.4.1. Environmental Concerns in India:

The Environmental issues in India are huge. Whether it's the rapidly dropping water tables, mass deforestation, land degradation or river contamination, India has it all and on a massive scale. Perhaps the largest of the environmental issues in India facing the people of India is inadequate or lack of access to vital fresh water resources. As India's industries get bigger so will the amount of water they require and the amounts are already beginning to spiral. Years of exploitation and extraction of groundwater in India has caused the national water table to suddenly and very dramatically drop. The rivers are on the front line of pollution in India. Millions of people depend on them for their livelihoods but they are slowly being polluted and destroyed by sewage, chemicals and other agricultural and industrial waste.

The story of deforestation is another of the highly serious environmental issues in India. It is predicted that almost 5.3 Million hectares of forest have been destroyed since the independence, most of it being chopped down for housing, industrialisation and river projects. It is estimated that the number of Mangrove Forests have more than halved in the last 20 years.

The government soon recognized the importance that these forests hold for the conservation of soil and put forward a range of polices trying to curb the destruction; of course, nothing has really changed and thousands of acres are destroyed every year with nothing in the way of 'replacement'. Poor management and abuse of power are again the increasingly sad cause behind the mass deforestation of India, some

call it greed. Protected areas are largely declassified so that commercial activities can take place but new areas are not reclassified. Poaching is another factor, people actually coming in and steeling trees and one of the final blows to the forest of India who already seem to have lost the battle is the invasion of foreign tree species such as Eucalyptus etc.

India now has one of the worst qualities of air in the world. Without a doubt the main contributor of air pollution in India is the transport system. In the cities, millions of old and very dirty diesel engines churn out millions of tonnes more sulphur than their western equivalents partly because of being old and partly because of the diesel.

1.5 RELATIONSHIP BETWEEN THE HUMAN SPECIES AND THE ECOSYSTEM:

There are many ways in which humans can conceptualise the relationship between their species and their surroundings, i.e. the whole eco-system. The cultural adaptations of humans have allowed them to colonize nearly every ecosystem type on Earth. In addition, cultural innovations have allowed the human population to grow exponentially for millennia. Such sustained population growth is unparalleled by any other species on the planet. The population of a typical species grows until it reaches the carrying capacity of its environment, then levels off or declines. In other words, it grows until it is fully utilizing the available resources, such as food and space. At this point mechanisms such as disease and starvation keep the population

from continuing to grow. However, we humans have responded to resource scarcity with cultural practices and technologies that increase the availability of resources. We raise our food on farms and live in multi-story apartment buildings, increasing the carrying capacity of the environment for humans. This growth eventually requires yet more cultural adaptations to increase resources, and the alteration of the natural environment and the rate of cultural evolution are accelerated. Currently the global human population is large enough and the technologies that allow humans to manipulate the environment are potent enough that human-caused alterations to the biosphere are causing the extinction of innumerable wildlife species. If present trends continue, there will be an eventual crash in the human population that will bring great suffering and cause widespread environmental damage. This is the root cause of the modern environmental crisis. This chapter deals with how we got into the present situation from the perspective of cultural interactions with wildlife and wild lands.

Early agrarian societies obtain food not just by foraging in natural ecosystems, but also by planting species that are important food items and/or raising livestock. They may supplement the food they raise with hunting and foraging. Those early agrarian societies that focus on planting are called horticultural societies, whereas those that focus on livestock as the primary food source are called herding or pastoralist societies. There can be considerable differences between these two types of societies, but we have grouped them both under early agrarian society for this discussion. Early agrarian societies are distinguished from late agrarian societies by the lack of metal ploughs, and beasts of burden to pull them. Examples of extinct

horticultural societies include the Aztecs, the mound building Native Americans of the Ohio Valley, and the early agriculturalists of the Middle East of 10,000 years ago. Many wet tropical areas of the world still support horticulturalist societies that practice small-scale slash and burn agriculture. The poor soil of such regions usually cannot support the permanent, large-scale, ploughed farming style of more advanced agriculture societies.

The mode of procuring food involves manipulation of natural eco-systems; early agrarian societies tend to have greater negative impacts on wildlife. Areas used to tend desired crops are not available to support the full species complement of the surrounding natural plant community, and livestock often compete with other animal species for forage. Denser human settlements may over-exploit wildlife in the surrounding wild areas, even if they are not directly manipulating the habitat. However, horticultural and herding societies are generally confined to only certain climates and habitat types, and their population densities are still relatively low, so often with these societies there are still considerable undisturbed areas that provide habitat for wildlife. Increased birth rates are commonly observed when people transition from hunter-gatherer to early agrarian societies and the denser, growing human populations place ever-increasing demands on the surrounding wildlife and natural ecosystems. Agrarian societies largely rely upon controlling and manipulating ecosystems to procure food, rather than on interacting with natural ecosystems and wildlife.

The present nature and complexity of socio-ecological systems are heavily contingent on the past; we cannot fully appreciate the present condition without going back decades, centuries or even millennia. As we are witnessing today with global warming, current societal actions may reverberate, in climatic and many other ways, for centuries into the future. As such, there is the real danger that our visions of the future are becoming unconstrained by knowledge of what has already occurred, at least in part because information about human-environment interactions in the historical past has not been well organized for this purpose or properly utilized. Human history has traditionally been cast in terms of the rise and fall of great civilizations, wars, specific human achievements, and extreme natural disasters (e.g. earthquakes, floods, plagues). Human societies respond to environmental (e.g. Climate) signals through multiple pathways including collapse or failure, migration and creative invention through discovery. Extreme drought, for instance, has triggered both social collapse and ingenious management of water through irrigation. Human responses to change may in turn alter feedbacks between climate, ecological, and social systems, producing a complex web of multidirectional connections in time and space. Ensuring appropriate future responses and feedbacks within the human-environment system will depend on our understanding of this past web and how to adapt to future surprises.

More recent changes in the human-environment relationship, such as accelerated globalization and global environmental change, have deep roots in humanity's relationship with nature over the past millennium. Important phenomena include a rise in human population, the strengthening of nation states, the global transfer of

inventions and values, the beginning of industrialization and the rise of global communications, and associated with these the dramatic modifications of land use and biodiversity, hydrological and energy flows, and key ecological processes. Turning to the more recent past, the 20th century witnessed several sharp changes in the evolution of socio-ecological systems, at both global (two world wars and the Great Depression) and regional (e.g. the failure of Soviet farming, its reliance on grain from the U.S., and subsequent collapse as a polity) discontinuities. Variations in the growth rate of carbon dioxide (CO2) in the atmosphere occurred in response to both climatic controls over land-atmosphere-ocean fluxes (for example, CO2 increases more rapidly in El Nino years because of climate effects on terrestrial ecosystems) and political events (the growth rate slowed during the 1970s oil shock and after the breakup of the Soviet Union because of changes in fossil fuel use).

Metropolitan regions will not come to balance until each one is small and autonomous enough to be an independent sphere of culture. Hence wherever possible, there is a need to work towards the evolution of independent regions in the world; each with a population between 2 to 10 million; each with its own natural and geographic boundaries; each with its own economy; each one autonomous and self-governing; each with a seat in a world government, without the intervening power of larger states or countries (Alexander, 1977, p.14).

1.6 THE ENVIRONMENTAL MOVEMENT:

Environment and its related challenges have been the focus of the whole world since a long time. This includes water and air pollution, as well as soil degradation and its ultimate effect on different species. It has been known that the publication of *Silent Spring* by Rachel Carson in 1962 was the start of the modern environmental movement. However, the roots of environmentalism may be much deeper. Farmer (1996) has traced the development of **Green Sensibility** in architecture back to folk buildings and the cult of the cottage through the nineteenth century in the writings of Ruskin, the work of the Arts and Crafts movement to the twentieth century and the organic ideas in Modern Architecture. The planning profession could also cite its list of planners with green credentials. Amongst these father figures of the planning world would be Geddes (1949), Howard and the Garden City Movement (1965), and Mumford (1938) with his analysis of the *Rise and Fall of Megalopolis*. No doubt other disciplines could legitimately cite their own list of people with deep concerns for the environment, many of them working long before the term **sustainable development** was coined. While it is not the intention to downgrade these fine scholarly traditions, nevertheless, for the purpose of this study, and for convenience, the beginnings of the modern environmental movement will be placed in the 1960s. The mood of environmentalism quickened with Rachel Carson's analysis of the inevitable damage caused by large-scale and indiscriminate use of chemical pesticides, fungicides and herbicides. Carson's influence was widespread, affecting pressure groups such as *Friends of the Earth*, in addition to the stimulus she gave to the development of green politics and philosophy.

Subsequently, the 1972 Stockholm Conference firmly put environment as a truly global political agenda. The Stockholm conference clearly stated 'The protection and improvement of the human environment is a major issue which affects the wellbeing of people and economic development throughout the world. It is the urgent desire of the people of the whole world and the duty of all governments' (Neill, 2009, p.25). The 1972 declarations have put a definite stress on protecting the needs of future generations. Environmental degradation and global climate change has impacted societies and states in different ways. Since then the challenge has steadily climbed the ladder of global importance.

1.7 THE QUEST FOR SUSTAINABLE DEVELOPMENT:

The basic principle of sustainable development is generation of all useful material resources, parallel with conservation and enhancement of the natural habitat. Indigenous technology has to be raised by applying the best available organisations and methods or by using the most appropriate and eco-friendly technology so as not to cause any injury to the members of the ecosystem concerned.

Unlike modern industry, the Indian handicraft and other indigenous industries don't usually destroy the environment and make the habitat unclean or unfriendly. Incorporation of all aspects into the value systems of the country would help conserve the scarce environmental quality of the habitats and promote social equilibrium at the very grass-root level by gainfully employing the vast reservoir of otherwise idle manpower lying in the rural backyard of India.

Fully sustainable and eco-friendly resource development demands that over consumption of goods and services should be severely curtailed, the craze for more and more material comforts should be contained and at the same time, it should entail fuller employment of the vast human workforce in productive activity based on the doctrine of *yoga-ksema* as has been enunciated in ancient India.

The need of the hour is fuller development of traditional skills, along with revival of indigenous handicraft and local industries, satisfying the need for both utility products and services of common daily value. India and other Third World countries in particular, where indigenous industries are still a vibrant social phenomenon, can possibly show the way to achieve really sustainable resource development without calling for serious environmental risks.

It can be concluded that if organised properly and managed with professional skill, the indigenous production technologies, based on the wonderful traditional wisdoms, can indeed assume increasing relevance in bringing about economic and cultural resurgence in the new, brave, healthy world of tomorrow.

1.8 CONCEPT OF SUSTAINABLE COMMUNITY:

From the outset, a sustainable community was defined as a community that meets the present and future social, economic and environmental needs of today's citizens without compromising the ability of future generations to meet their own needs. The concept of sustainability was closely tied to the overlapping values of social equity,

economic viability and environmental quality. Characteristics important to a sustainable community included healthy citizens, a healthy environment, availability of basic needs, social inclusion, a strong economy, development of a community identity, and balance in decision making. A sustainable community should have a clearly defined and legislated environmental enhancement strategy. In order to design a sustainable community model, confrontation must give way to collaboration, decisions must follow sustainability principles, citizens must be engaged and empowered, and attention must be paid to achieving a balance between the interrelated values of the economy, the social system and the environment.

1.9 CONCLUSION:

We are at a time when development is understood in terms of technology which is generally insensitive to the people and the environment if not used holistically. This typology of development tries to satisfy the veracity of the upper classes of the society rather than the common people and also contributes to injustice and inequality in the environment. It poses a threat to the very survival of the entire planet. So the time has come to bring a convergence between recent trends of development and societal ethics, for the sake of development that will be sustainable. We can learn from the indigenous knowledge systems which prevail in many parts of the world. In this context it is good for us to remember the Gandhian thought which says that the earth has enough resources for everyone's need but not for everyone's greed.

The urgency of protecting endangered species or the treatment of animals in the present urbanised and industrial system of food production and consumption is required to be understood properly with respect to the recent developments in the ecosystem. In order to move forward we need to embrace the notions of environmental justice based on recognition, capabilities, and participation in relations between human communities and non-humans. If the non-humans are to be entitled to a fair share of essential goods, and their right to flourish is recognized, the inclusion of non-humans within political and cultural systems would be a necessary consideration. The expansion of moral spheres of all the humans to make them understand importance of the consideration of ecological aspects of all types of socio-economic and political developments is the utmost step in the process of creation of ecologically sustainable communities. Transition away from automobile culture, towards renewable energies, and towards composting and water recycling are part of the green movement to achieve sustainable communities.

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CHAPTER II

ECOLOGICAL PERSPECTIVES OF ERNEST CALLENBACH

2.1. ENVIRONMENTAL ETHICS

Environmental ethics is a branch of ethics that studies the relation of human beings and the environment and how ethics play a role in this. Environmental ethics believe that humans are a part of society as well as other living creatures, which includes plants and animals. These items are a very important part of the world and are considered to be a functional part of human life. Thus, it is essential that every human being should respect and honour this and use morals and ethics when dealing with these creatures.

Global warming, global climate change, deforestation, pollution, resource degradation, threat of extinction are few of the issues from which our planet is suffering. Environmental ethics are a key feature of environmental studies, which establishes relationship between humans and the earth. With environmental ethics, you can ensure that you are doing your part to keep the environment safe and protected. Every time that a tree is cut down to make a home or other resources are used we are using natural resources that are becoming sparser to find. It is essential that you do your part to keep the environment protected and free from danger. It is not as difficult to do as you may think so long as you are willing to make a few simple and easy changes.

With the rapid increase in world's population, the consumption of natural resources has increased several times. This has degraded our planet's ability to provide the

services we humans need. The consumption of resources is going at a faster rate than they can naturally replenish. Environmental ethics builds on scientific understanding by bringing human values, moral principles, and improved decision making into conversation with science. It was Earth Day in 1970 that helped to develop environmental ethics in the US, and soon thereafter the same ethics were developed in other countries including Canada and North America. This is important because the ethics of the environment are of major concern these days.

The acts of humans lead to environmental pollution. The stronger demand for resources is also a factor that contributes to the problem as we all need food and shelter. When these things are so desired and need the natural balance of the environment is disturbed. Engineering developments are resulting in resource depletion and environmental destruction. There are several environmental issues that have created havoc on our environment and human life. If ignored today, these ill effects are sure to curb human existence in near future. The major environmental issues include Pollution, Overpopulation, Industrial and Household Waste, Acid Rain, Climate change, Ozone Layer Depletion, Urban Sprawl, Genetic Engineering, Deforestation and Global Warming. These environmental issues have taken toll on our environment and we have already started seeing some disastrous effects in the form of effect of health on humans, rise in sea level, depletion of non-renewable resources, melting of glaciers, extinction of species, polluted landfills, toxic dust, decreasing soil fertility, rise in air and water pollution and many more. Cutting down of trees is something that many humans do for their own benefit, without any concern for the animals which are dependent on trees for survival. Using fossil fuels erratically, industrialization, pollution, disturbing ecological balance, all these are

attributable to human activities. Just because we are in possession of all of these natural resources does not mean that we can use those resources in any manner in which we choose without keeping anything for the future generations.

Industrialization has given way to pollution and ecological imbalance. If an industry is causing such problem, it is not only the duty of that industry but all the human being to make up for the losses. Artificial and restored environment will able to sustain. It will not be able to take the place of the natural resources. Environmentalists are trying to find answers to these difficult situations and all these together are termed as environment ethics. It is the responsibility of all to ensure that environmental ethics are being met. It is somewhat difficult to make adjustments that are necessary to ensure that you are following all environmental ethics. Ethics plays an important role in our society today, and environmental ethics and business ethics must be considered. Rationally this has become more prevalent in today's society.

Both oil and coal are bad, but not only for the environment, but for all living creatures, including plants and animals. Both are highly toxic in their natural raw state. They pollute the air and ground and water, and whether or not they are helping to create these natural disasters should be irrelevant. They are both finite, and will not last forever, and the sooner we rid ourselves of the need for these two demons, the better. While oil and coal companies continue to promote their products, and the best yet is clean coal, which is an unethical definition of something that just is not possible, their ethics come into question, especially environmental ethics. Most of

the world's ills are derived from both of these, with oil spills, mining accidents, fires, and now climate change and global warming.

2.1.1. PROTECTING BIODIVERSITY

Protecting biodiversity is now very essential since biodiversity is crucial for reducing climate pollution and dealing as well as adapting to the effects of climate change. If we do not protect biodiversity, the effects could be as harmful as the effects of global warming itself. This is especially true with tropical forests- they are critical to fighting climate change and home to more species than any other ecosystem type. In other words, protecting biodiversity is essential for our well being. Biodiversity helps to balance the nature.

Biodiversity has its own economic importance, so protection of biodiversity is important. As we all know farm crops as well as animals are mainly descendents of wild organisms. They are generally the component of biodiversity. Some varieties of old crops have more taste or disease resistance, and they may be more suitable to future changes in the climate. Most of the fruit crops depend on various insects for pollination of their flowers. Venison or salmon are also a source of food for human. Fishermen simply harvest or use natural biodiversity of the oceans and river. Considering the essentiality of biodiversity, it is an important part of sustainable development. In simple words, biodiversity is a measure of sustainable development. As we know, sustainable development is considered as a major target for industry as well as planning system. However, the only way to achieve this target is to measure biodiversity. Apart from this biodiversity is essential a provider of natural services, although we may not readily recognize it. For instance Peat bogs, plays an important

role in purifying water and also lock up carbon dioxide. Tiny plants that grow also absorb large amount of carbon dioxide. That is why protecting biodiversity is essential.

To be very precise biodiversity protection is very much important since biodiversity is a fundamental component of life on Earth. It creates complex ecosystems that could never be reproduced by humans. The value of that biodiversity, both intrinsically and to humans, is immeasurable, and thus must be protected. In the end, we both want and need biodiversity. We continue harming the natural environment without realizing the impact. We should be aware of protecting biodiversity. Moreover, we should know the importance of biodiversity for making good ad better life on the Earth.

2.1.2. RECYCLING WASTE

With the increasing human population the needs for the people also increases. But the point of concern is that are there enough natural resources to service all your needs. What if these resources finish, this is one thing we need to ponder upon. We need to start recycling waste to converse our natural resources. Recycling is simply the process of reusing the items from which utility can still be derived. It is important to recycle waste so that you can at least converse some of our natural resources for our generations to come.

Many products such as paper, cardboards, and cups come from trees. In fact trees are our natural assets, you can converse trees by recycling the paper products we can minimize the number of trees cut down a year. This is one form of waste recycling.

One should understand and know the importance of recycling waste materials. One simple benefit of recycling is it saves our resources. It will be wise to reuse metal item as metal reserves are depleting. You can sell your wore out metal items for recycling. As mentioned earlier, recycling of waste papers can save our forests.

Recycling waste not only saves our natural resources but also helps save energy. By simply recycling an item or making a basic fix to it, we can save all the energy that would have been consumed in the process of making it. The same example can be taken with plastic items. A large amount of energy can be saved by simply reusing the plastic items. To recycle waste is to simply reduce pollution. By recycling plastic material we can reduce air pollution as well as water pollution. Plastic factories produce large amount of smoke when producing plastic material. At the same time if we do not have proper waste disposal system those waste emissions will cause water pollution. Recycling waste in a way helps reduce pollution.

In simple words, recycling or recycling waste is essential to both natural environment and humans. To sum up, recycling minimizes the need for raw materials so that the rainforests can be preserved. Great amounts of energy are used when making products from raw materials. Recycling requires much less energy and therefore helps to preserve natural resources. One needs to know the importance of recycling at the same time being earth friendly can help our planet to be a better place to live in.

2.1.3. GREEN BUILDING AND GREEN LIVING

Being eco-friendly will help save our planet as well as make it a better place for future generations to come. It is in our hand to make our environment healthy to live in. Green building which is also called as green construction or sustainable building is simply the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle.

Green building principles aimed at minimizing impact upon the environment. In other words, these buildings are specifically designed to reduce the entire impact of the built environment on human health and the natural environment through the efficient use of the resources such as water, energy and other resources. They aimed to protect occupant health and improve employee productivity as well as to reduce waste, pollution and environmental degradation. The concept of building green provides the key advantages of environment or earth friendly, energy efficient, water conservation, fire safety as well as excellent indoor air quality.

A similar concept with green building is natural building, which is generally not in larger scale and basically focuses on using natural materials that can be found locally. As far as green living is concerned, it is more than recycling and conserving energy. One needs to learn about different green products as well as environmentally or earth friendly construction materials. For living green you also have to get familiar with the alternative energy resources. Also the green service that is available to home owners nowadays is trying to make energy efficient homes or green buildings.

The increasing global warming, depletion of natural resources and the energy crises have made us aware and the government that the change is very much essentials for our world to survive. We should find a greener way to live our lives. Moreover, one needs to find necessary information that will make their home and family more environmental friendly as well as more energy efficient. The above article will help you get a brief idea about green building and green living, furthermore helps you know its importance in making healthy environment to live in.

2.2. RELIGIOUS FOUNDATIONS OF ENVIRONMENTAL ETHICS

Religious precepts are embedded in the respective scriptures of religions. They also seem to find their expression in the structured legal systems of various traditions and communities. The praxis-centred concepts influenced wide range of ethical thoughts in such a way those environmentalists who support their demands and principles, thought it significant to look into these religious moorings. Environmental Ethics had developed as a response to failure of each ethical theories or incapability of ethical doctrines to deal with problems faced by mankind in understanding man's moral status vis-a-vis nature. It is an acknowledged fact that religions have not only determined the way we perceive the world but also set roles individuals play in nature. Consequently, neither religion nor environmental ethics can survive in all times unless and until they are tied up with appropriate hermeneutics. It may be necessary that a moral science of environment and its underpinnings in theological doctrines have to have redefined and re-coordinated for a proper interdisciplinary articulation.

India is a cradle of various religious sects like Hinduism living in complete socio-cultural harmony. Reverence for nature and its creations is the unifying ethical principle in almost all religions of India. They have all kept nature above man. Our ancient people learnt to live with five elements of nature, the earth, water, air, light and cosmos and actually worshipped them in reality and symbolically. The scriptures provide information about the relationships between man and nature and the human behaviours and indebtedness towards nature from the writing in the ancient Indian treaties and literatures, the Vedas and the Upanishads are all religions prevailing in India (Poddar, 2014, p.23).

The messages of environmental conservation contained in the Vedic and Puranic literatures, in the *Upanishads, Arthashastra, Charak Samhita, Ramayana* and *Mahabharata* are all based on Hindu religious philosophy. Non-violence, that is, non-injury to both the living as well the non-living creations of nature such as plants, animals, air, water, land (earth), hill and forest is the core of Hindu religious philosophy which extended up to Jainism and Buddhism. All social and cultural activities in Hinduism have some environmental overtones. Hindus have extended their relationship from social and natural environment treating rivers as their mother goddess, forest as gods, totemic animals as brethren and prey species as mortalities. Traditional Hindus believe that trees can bring peace, prosperity and consolation to mankind, worship of god a green tree is considered to be a sin and sacrilege which can spell disaster for the family and even for the entire village community a traditional Hindu father is specially guided by the moral restrictions of destroying a green tree (Bhandarkar, 1965, p.71).

The *Bhagawad Gita* mentions that all human activities should be performed for the welfare of the world. This is *'seeing inaction in action'* (Ramsukhdas,2014b, p.31). Hindu homes worship peepal tree (*Ficus religious*) off widowhood; the worship of Coconut tree (*Cocus nucifera*) is believed to be a symbol of fecundity and so Hindu women who nurse the desire to get a son worship coconut trees and eat coconut fruits as a '*divine gift'* (Das Gupta, 2003, p.11).

The primitive Hindu societies of India represented by the tribal's (aborigines) living in mountains and forests have significantly contributed a protection and preservation of several virgin forest patches in rich in biodiversity (David, 1980,p.13). They are called sacred groves (Forest of God) and are left untouched by the local people. All interferences into it are a taboo, it is usually dedicated to a deity or mother goddess who is supposed to protect and preside over it and the intruders will be punished. Such sacred groves are found all over India particularly in the Western Ghats and north-eastern Himalayan regions and have become part of the Biosphere Reserves of India containing some of the rare and endangered species of plants and animals. They are repository of some valuable germless, which would be needed by the posterity for sustaining agricultures in future.

2.2.1. THE VEDAS (2500 TO 1500 B.C.)

The Vedas are ancient Indian compilations of the Aryan period ranging between 2500 to 1500 B.C. *Rig-Veda* especially mentions about environment on several occasions. A verse from the *Rig-Veda* states that "*the sky is like father, the earth like mother and the space as their son. The universe consisting of the three is like a family and any kind of damage done to any one of the three throws the universe out*

of balance" (David, 1980, p.121). Vedic culture and Vedic scriptures reveal a clear concept about the earth's ecosystems and the necessity for maintaining their balance. Another verse from *Rig-Veda* says "*Thousands and Hundreds of years if you want to enjoy the fruits and happiness of life, then take up systematic planting of trees*" (Dwivedi and Tiwari, 1987, p.14). These verses carry a message to desist from inflicting any injury to the earth and embark upon constant afforestation for survival or else the ecological balance of the earth would be jeopardized. *Rig-Veda* has dwelt upon various components of the ecosystem and their importance. Rivers occasionally suffer widespread destruction if their coasts are damaged or destroyed and therefore trees standing on the coasts should not be cut off or uprooted. Modern civilization is experiencing the wrath of flood due to erosion of river embankments everywhere and only tree plantations along river banks cannot prevent erosion.

The *Atharva Veda* also mentions about the importance of air, water and green plants essential for human existence. Although there was as such no concept of the word 'Pollution' (Dwivedi, 1990,p.16) those days but it was referred in terms of poisoning of environment. The A.V. 18.17 (Ramsukhdas,2014b, p.1928) recalls that three things cover the universe- the air, water and the plants and they are essential for all lives on earth to exist. *Atharvaveda* has also warned not to dirty and add toxic substances into water bodies as it may lead to spread of diseases 'he who dirties or spoils ponds, lakes, rivers, etc., or cause smell near residential area is liable to chastisement' (Joshi and Namita, 2009,p.8).

The *Yajurveda* too mentions about plants and animals, the ill effects of cutting of trees; and the poisoning of the atmosphere; but it also discusses about energy

relations of the global ecosystem. "*No persons should kill animals helpful to all*" (Ramsukhdas,2014b, p.1878). "*O King you should never kill animals like bullocks useful in agriculture or like cows which gives us milk and all other helpful animals and must punish those who kill or do harm to such animals*" (Ramsukhdas,2014b, p.1670). The oceans are treasure of wealth, protect them; "*Do not poison (pollute) water and do not harm or cut the trees*".*Do not disturb the sky and do not poison the atmosphere*" (Ramsukhdas,2014b, p.1859). About the flow of energy in the global ecosystem the Yajur Veda says 'the whole universe is full of energy'(Ramsukhdas,2014b, p.1368) in which the sun is at the centre and the ultimate source of energy for all living organisms on earth. The net energy flows from the point of production to the point of consumption through the plants, animals, human beings, the air, water and land, and is completely under the control of Almighty. While energy flow and balance is maintained in the universe yet some imbalance this causes several natural disturbances like untimely rain, heavy rain, drought and flood, warm winter and cool summer. The earth provides surface for vegetation which controls the heat build-up.

The herbs and plants having union with sun rays provide congenial atmosphere for the life to survive. Now global warming is an established phenomenon. The carbon dioxide build up in the atmosphere (due to burning of fossil fuels) and the global deforestation are major factors of global warming (Sinha, 1991, p.51). The green plant (forest) through the process of photosynthesis (utilizing the sun's energy) works as a 'natural sink' absorbing all the carbon dioxide and help in reducing the warming effect. Green plants give out plenty of oxygen during photosynthesis and also directly absorb the solar heat radiation of the atmosphere to give out water

vapour in the process of transpiration. The combined effects of the two processes make the environment cool and congenial for survival of all life.

2.2.2. THE UPANISHADS (1500 TO 600 B.C.)

The *Upanishads* sages perceived the existence of God in trees and other plants and those they were gifted to man as a companion for mutual survival. The God who exists in the universe, lives in air, water, in fire and also in trees and herbs, men should have reverence for them. *Brhadaranyaka Upanishad* (Ramsukhdas,2014b, p.1649) equates trees with human beings as follows: Just like a tree, the prince of the forest, so the man is, in truth (Trivedi, 2004, p.23). In the *Taittariya Upanishad*, certain norms were prescribed for human beings to keep the environment clean. "*One should not cause urine and stool in water, should not spit in water; and should not take bath without clothes*" (Goyandka, 2013, p.80). The *Upanishad* has revealed the secrets of existence of life on earth and the importance of every organism for mutual survival. The universe along with its creatures belongs to the Lord. No creation is superior to any other.

Human beings should not be above nature. Let no one species encroach into the rights and privileges of other species. These verses from the *Iso-Upanishads* uttered thousands of years ago is true and have become even more relevant today as the modern human civilization armed by the technological weapon, made arrogant of his scientific knowledge and compelled by the ever increasing greed for material achievement is systematically encroaching into the living rights of all other life forms on earth by using, misusing, exploiting and over-exploiting the finite and scarce natural resources of earth. The concept of sustainable development which the

modern environmentalists are harping upon to use the natural resources judiciously for a more stable development and without impairing with the abilities of the future generations to use those resources, and without interfering into their living rights was perhaps inspired by these verses of the *Iso-Upanishad*.

2.2.3. THE PURANAS (4THCENTURY A.D.)

The puranic literature belonging to 4th century A.D. also contains messages related to the conservation of environment. In Narasimhapuram killing of birds for eating was prohibited. "*O, wicked men if you kill a bird then you are bathing in a river, pilgrimage, worship and yagnas are all useless. God Keshava is pleased with a person who does not harm or destroy other creatures or animals*" (Goyandka, 2013, p.148). The puranas also recalls the virtues of plants and trees and stressed on the need to tree plantations. "*The inhabitants of a house which has sacred basil (Ocimum sanctum) are fortunate*" (Goyandka, 2013, p.231). "*The yama (messenger of death) do not enter a house where sacred basil is worshipped every day*" (Goyandka, 2013, p.174). The *Varah Purans* says that "*One who plants a peepal (Ficus religiosa), one neem (Azadirachta indica), one Banyan (Ficus benghalensis), two pomegranates (Punica granatum), two orange (Citrus reticulate),* five mango trees (Mangifera indica) and ten flowering plants or creepers shall never go the hell" (Goyandka, 2013, p.122). The practice of *Vanmahotsava* (Tree Plantation Ceremony) is over 1500 years old in India. The *Matsya Puran* tells about it. *Agnipuran* says that the plantation of trees and creations of gardens leads to eradication of sin (Goyandka, 2013, p.30). In *Padma Puran* the cutting of a green tree is an offence punishable in hell.

Hinduism has always been an environmentally sensitive philosophy. No religion, perhaps, lays as much emphasis on environmental ethics as Hinduism. The *Mahabharata, Ramayana, Vedas, Upanishads, Bhagavad Gita, Puranas* and *Smriti* contain the earliest messages for preservation of environment and ecological balance. Nature, or Earth, has never been considered a hostile element to be conquered or dominated. In fact, man is forbidden from exploiting nature. He is taught to live in harmony with nature and recognize that divinity prevails in all elements, including plants and animals. The rishis of the past have always had a great respect for nature. Theirs was not a superstitious primitive theology. They perceived that all material manifestations are a shadow of the spiritual. The *Bhagavad Gita* advises us not to try to change the environment, improve it, or wrestle with it. Ecology is an inherent part of a spiritual world view in Hinduism. It is perhaps a remarkable feature of the Indian tradition that from its very early beginnings ethical ponderings were never too far off from the overwhelming awareness of nature, in as much as forms of life were derivative of or entailed by a particular outlook on nature of which the human being, as other species or sectors of brotherhood, was seen as a constitutive, at times lost, alienated or anomalous, perhaps even an outrageous or offending, part. In their moral judgements, the early Indian people placed on the side of the good, values such as happiness, survival, courage, health, joy, calmness, friendship, knowledge and truth; and on the side of bad, more or less their opposite or disvalues, notably, misery, suffering, sickness and injury, death, infertility, pain, anger, enmity, ignorance or error, untruth.

2.3. CONCEPT OF ECOLOGICAL UTOPIA 'ECOTOPIA':

Environmental quality is necessary for quality of human life. Humans dramatically rebuild their environments; still, their lives, filled with artefacts, are lived in a natural ecology where resources- soil, air, water, photosynthesis, climate- are matters of life and death. Culture and nature have entwined destinies, similar to (and related to) the way minds are inseparable from bodies. So ethics needs to be applied to the environment (Goyandka,2013,p.42).

Contemporary ethics has been concerned to be inclusive: the poor as well as the rich, women as well as men, future generations as well as the present. Environmental ethics is even more inclusive. Whales slaughtered, wolves extirpated, whooping cranes and their habitats disrupted, ancient forests cut, Earth threatened by global warming-these are ethical questions intrinsically, owing to values destroyed in nature, as well as also instrumentally, owing to human resources jeopardized. Humans need to include nature in their ethics; humans need to include themselves in nature. Ironically, just when humans, with their increasing industry and technology, seemed further and further from nature, having more knowledge about natural processes and more power to manage them, the natural world has emerged as a focus of ethical concern. Human power to affect nature has dramatically escalated, as with species loss or global warming. Exploding populations raise concerns that humans are not in a sustainable relationship with their environment. Nor have they distributed the benefits derived from natural resources equitably. Nor have they been sensitive enough to the welfare of the myriads of other species.

The bio-centric environmentalist agenda of concern lists the following factors- humans, animals, organisms, species, ecosystems, Earth. These are again criss-crossed with over a dozen differing approaches to environmental ethics: humanistic ethics, animal welfare ethics, biocentrism, deep ecology, land ethics, theological environmental ethics, ethics of eco-justice, communitarian ethics with circles of concern, environmental virtue ethics, axiological environmental ethics, political ecology, sustainable development ethics, bioregionalism, eco-feminism, postmodern environmental ethics, and an ethics of place. This is where the concept of ecological utopias arises.

Humans need to be healthy. Health, however, is not simply a matter of biology from the skin-in. Environmental health, from the skin-out, is equally as important. It is hard to have a healthy culture on a sick environment. More than that, humans desire a quality environment, enjoying the amenities of nature- wildlife and wildflowers, scenic views, places of solitude- as well as the commodities- timber, water, soil, natural resources. Supporting environmental health and a quality environment can certainly be counted as duties within a social contract, as described by Plato. All these elements finally form the way to Ecological Utopia, i.e. *Ecotopia*.

2.4 ERNEST CALLENBACH'S 'ECOTOPIA': A UTOPIAN ANALYSIS

2.4.1. Introduction

In 1975, Ernest Callenbach published his book '*Ecotopia-The Notebooks and Reports of William Weston'*. It is a seminal utopian novel and one of the first utopias to have a strict ecological perspective. In the 70's there was a lot of discontent of

how the market and the government were serving the citizens, which resulted in many new counter-cultures and left-thinkers becoming more influential. Callenbach's *Ecotopia* targets this fact and his book came to influence the counterculture and the Green Movement.

The book is set in1999 and consists of the daily reports and columns provided by the reporter William Weston. Weston is sent out by the Times-Post to spend 6 weeks in Ecotopia where he will continuously report back to the U.S. Weston is the first American journalist ever to investigate Ecotopia properly. Prior to his visit most Americans have not even been allowed to visit Ecotopia. In the book Winston's reports are followed by his personal diary notes, which provide the reader with his experience from the trip on a much more personal level.

Callenbach, the author was born on April 3, 1929. He received a bachelor's degree in English in 1949 and a master's degree in English in 1953 from the University of Chicago. Two years later, after studying at the Sorbonne in Paris, he became an assistant editor for the University of California Press. He founded Film Quarterly in 1958 and edited it for 33 years. He also edited books on film for the university. He wrote several books including *Ecotopia, Ecotopia Emerging, and Living Cheaply with Style*. He died of cancer on April 16, 2012 at the age of 83.

2.4.2. History and Philosophy of Ecotopia

The nation Ecotopia was created through secession from the U.S 20 years before the book takes place (in other words in 1979). It consists of the former states of Northern Carolina, Oregon and Washington. Weston reports that this kind of

secession has become a worldwide tendency during the last decades; Belgium had dissolved into three countries, Bangladesh had broken free of Pakistan, Quebec from Canada and so on. The only part of the world that had gone in the opposite direction was the Scandinavian countries which had formed a union (Callenbach, 1975, p.9). The relationship between the U.S and Ecotopia has since the independence been tense, and the contacts between the two countries have been limited to absolute minimum.

The book *Ecotopia* describes a society in which recycling is a way of life, gas-powered cars are replaced by electric cars (although most people walk or commute on high-speed magnetic-levitation trains) and bicycles are placed in public spaces to be borrowed at will. In Ecotopia, solar energy is commonplace, organic food is locally grown and, instead of petrochemical fertilizers, processed sewage is used to cultivate crops. The philosophy of Ecotopia is based upon a strong belief in living in balance with nature. Every action taken has to be in accordance to the notion of the **stable state** which is the first mission of Ecotopia. The concept of stable state is built upon the idea that nothing produced in Ecotopia should have an impact on the well-being of the nature; everything should be recycled and reused. This concept has implication for every aspect of life, from the personal to the most general.

On a less practical level, this belief in nature becomes more like a religion and is highly present in the spirit of the ecotopians. At many places in the book, the ecotopian's relationship to Mother Nature is compared to that of the Indian's. And indeed, many ecotopians take Indian-inspired names and practice a nature religion similar to the Indians, as influenced by the Indian scriptures. Marissa Brightcloud,

Winston's ecotopian friend and lover and also a tree-worshipper, is one example of this.

But the goal of Ecotopia is not to go back to the Stone age. On the opposite, Ecotopia uses the newest technology and science to create an environment as green as possible. The combination of cutting back on some modern features, like mass consumption, and the use of cutting-edge technology to make the modern way of living eco-friendly, is what makes Ecotopia so special (Callenbach 1975,p. 149). They hunt using bow and arrow but have the most high-tech system for solar energy. Throughout the whole book Callenbach let the ecotopian people argue for their belief in a very convincing way and at the end of the book you are in no doubt that this extremist green society is realizable. In Ecotopia, the people actually seem to be happier and more in contact with their inner nature, and at the end Weston ends up leaving the pleasant life of mass-consumption behind and stay in Ecotopia. A novel both timely and prophetic, Ernest Callenbach's Ecotopia is a hopeful antidote to the environmental concerns of today, set in an ecologically sound future society. Callenbach offers a visionary blueprint for the survival of our planet and our future.

Ecotopia is the most plausible utopia because it does not seek the perfection of humans or of nature. "*The system provides the stability*," one Ecotopian explains, "*but we can be erratic within it. I mean we don't try to be perfect, we just try to be okay on the average- which means adding a bunch of ups and downs*" (Callenbach, 1975, p.31). Still, the margin for being erratic is fairly small. Weston says of Ecotopia, "*Individuals don't perhaps stand out as sharply as we do. Nobody is as essential (or as expendable) here as with us*." (Callenbach,1975, p.68). Ecotopia

embraced the radical decentralization of government, allowing each state, city and region to craft its own policies, though as a whole, the nation favoured renewable energy, recycling, communal ownership of farms and forests, and a laissez-faire economic policy that relied on people's intrinsic motivations towards sustainability rather than regulation or coercion. Differences were worked out through debate, political discourse, and if needed, courts. Ecotopia's earth-friendly agenda includes: energy-efficient mini-cities to eliminate urban sprawl, zero-tolerance pollution control, tree worship, ritual war games, and a woman-dominated government that has instituted such peaceful revolutions as the twenty-hour workweek and employee ownership of farms and businesses.

2.4.3. Cities and Infrastructure

Since the independence, the established urban areas have to some extent been broken up into smaller communities. Still, some bigger cities remain and this is somewhat outside of the ideal long-term line of development (Callenbach 1975, p.39). Ecotopia's urban vision is to become a decentralized society where all the people live in so called **minicities**. Some minicities are already established and these are connected to each other through trains that operate by magnetic suspension. (Callenbach 1975,p.15) Within these cities there are no cars, instead people use electrical traction units to transport themselves and goods within the cities and on the countryside. There are electrical minibuses that work as public transportation (all of which is free) but the otherwise the cities are car-free zones. To transport goods and supplies for shops, such as farm produce, there is an underground conveyer belt system that connects all the shops and factories in the minicities.

The downtown areas of the cities are not crowded with business buildings as one might think. In Ecotopia, businesses have been out located from the inner city to leave space for apartments. In the bottom of these apartment buildings there are restaurants, libraries, bakeries, core stores selling groceries and clothes, small shops, even factories and workshops (Callenbach,1975, p.39-40) The apartment buildings are, like almost all the buildings in Ecotopia, built entirely out of wood. Wood has become the predominant building material in Ecotopia due to the successful reforestation program (Callenbach, 1975, p.40).

2.4.4. Economy and Production

The transformation of Ecotopia into an ecological nation at stable state with the nature naturally implied big changes to the economy as well. One of the first steps was to adopt the 20 hour work-week. This brought upon a need to isolate the economy from the competition of harder-working people but it also implied serious dislocations and layoffs for years. This caused, not surprisingly, a crisis to the whole ecotopian economy and there was a drop in the GNP by more than a third (Callenbach,1975, p. 66). But the biggest changes caused by the decreased workweek happened at a more philosophical level. The ecotopians started to assume that mankind was not meant for production. Instead, humans were meant to 'take their modest place in a seamless, stable-state web of living organisms', disturbing that web as little as possible. This would mean a sacrifice of present consumption, but it would ensure future survival -which became an almost religious objective, perhaps akin to earlier doctrines of 'salvation' (Callenbach,1975, p.66-67).

This philosophical change had grave implications for the economy but the ecotopians were convinced that economic disaster wasn't identical with survival disaster. This belief helped Ecotopia through this tough transition period (Callenbach,1975, p. 67). The unemployed were absorbed in the construction of the railways, and of the sewage and other recycling facilities. When the 20 hour workweek was introduced the numbers of jobs were doubled but it virtually halved individual income. Accordingly, there were, for several years, rigid price control on all basic foods and other absolute necessities (Callenbach,1975, p. 69).

There have also been big changes in the production of food and in the use of materials. For example, all agricultural production has been nationalized, not such a tough step since Ecotopia had a stupendous surplus of food production. Also the Ecotopians eat better food than any other nation on earth as they grow all natural food without any herbicides and insecticides. Also packaged food is least on use in Ecotopia. The food preparation practices are sound avoiding the processing that destroys food values and thus Callenbach describes that Ecotopia has attained a 'stable state' (Callenbach, 1975, p.21).The use of metal has been forbidden throughout Ecotopia, unless it is absolutely necessary. The use of iron is only accepted in some cases since it rusts away over time. One might think that the use of plastic would be forbidden as well, but that is not the case. Ecotopians use plastic in a way that does not diverge from our way of using it. The difference is however, that they have developed a type of plastic that is totally biodegradable, that is, susceptible to decay (Callenbach,1975, p. 113). All the energy production in Ecotopia is sourced from the sun and the sea. They use brilliant solutions including thermal-gradient power plants to extract energy from the sea and solar cells formed

as gigantic parabolas to get the most out of the sun as possible. The system of oil- and gas-fired power plants that they inherited from the U.S., they closed within a few years. The stable-state goal might see impossible and extremist at the start but the utopians seem too adept at using moderate and gradual changeovers to reach these extreme goals. And as the Assistant Minister of Food puts it: "*Our system is considerably cheaper than yours, if we add in all the costs*" (Callenbach,1975.p. 31).

Clothing in Ecotopia does not include nylon, orlon, dacron or any other synthetic materials. Only cotton is used for all types of clothing and the fabrics and garments are all domestic products.

2.4.5. Government

Ecotopia's chief of state is named Vera Allwen and is a very powerful woman. She is the head of the Survivalist Party that played a key role in the struggle for independence. One distinctive feature of the Survivalist Party and of the political sphere as a whole is that it is mostly composed of women. This is an indicator of the role of women in Ecotopia. Ecotopian women are perfectly equal to men in every sense and are often described as outspoken and sexually liberated. The women's role as mothers are important, but not in the same way as in our modern societies. The ecotopian family is an extended version of our concept and often consists of around 20 people living together and raising the children together. This is one example of the things that has had effects on the status of the women. In today's ecotopian society she plays a big, if not to say the bigger, part.

When the women-dominated Survivalist Party came into power and the conditions had stabilized, the government structures of the states and counties were reorganized. The Party considered them to be outmoded and unrelated to the organic structures of production and consumption. Moreover, they were considered to be inadaptable for dealing with regional ecological systems. Accordingly, Ecotopia was divided into five metropolitan and four rural regions. These regions also got greatly extended powers of government of the local communities.

The decision-making process within the party is described rather as social discussions than strict meetings with formal agendas. During the discussions, general issues begin to take shape, but there are no votes or organized decision-making. Instead, consensus is achieved after the ventilation of everyone's opinion. Only after this consensus is achieved, a formal ratification of the decision is taken.

The content of the ecotopian law has changed somewhat since the independence. Crimes against the nature, such as deliberate pollution, are the ones that the system looks most seriously upon, and those crimes are punished by severe jail sentences. So called victim-less crimes, such as prostitution, gambling, and drug use (marijuana is very common in Ecotopia), are no longer on the books. Embezzlement, fraud, collusion, and similar are on the other hand called gentlemen's crimes and are dealt with just as severely as crimes like assault and robbery. Crimes related to violent behaviour are rare in Ecotopia, "*perhaps because of the personal nature of their neighbourhoods and the virtual impossibility of anonymity in them*" (Callenbach,1975, p. 125).

2.4.6. CONCLUSION:

Ernest Callenbach's *Ecotopia* is an extremely detailed utopian story, full of both fantasy and interesting technological solutions that actually have a root in reality. Throughout the whole book Callenbach let the ecotopian people argue for their belief in a very convincing way and at the end of the book you are in no doubt that this extremist green society is realizable. In fact it is easy to see the many advantages with it, and not only the obvious ones. In Ecotopia, the people actually seem to be happier and more in contact with their inner nature, and at the end Weston ends up leaving the pleasant life of mass-consumption behind and stay in Ecotopia. In Ecotopia, sustainability is the foremost concern. Consequently, production is small-scale and laws require that goods be durable and easily repairable. What cannot be repaired or reused simply gets recycled or composted, as almost everything is organically produced. In Ecotopia, the steady-state economy has been attained.

Constructing an imaginary society is like designing a game, where the society evolves rules, principles and conventions. Callenbach's politics fiction, based on the assumption that a critical mass of people come under the realisation that their survival and happiness depend upon giving at least as much weight to the biological bottom line or the ecosystem as to the economic one for a holistic development. This kind of development can be termed as '***Bio-economics***'.

2.5 THE UTOPIAN VALUES OF 'ECOTOPIA EMERGING' BY ERNEST CALLENBACH:

Ecotopia Emerging by Ernest Callenbach is a fictionalized history of the events leading up to the secession of Northern California, Oregon, and Washington to form the steady-state, environmentalist nation of Ecotopia along the Pacific Coast of the United States. In 1975, Callenbach had published a utopian novel called Ecotopia about the events; *Ecotopia Emerging* is the prequel, published in 1981. The story seems to take place in the 1990s; Callenbach assumes that the pro-business, anti-environmental Reagan-era policies- already evident at the time of publication- will have persisted in the United States after Reagan's presidency. The book is mainly a history of the Ecotopian independence movement. The main characters are Vera Allwen, the leader of the Survivalist Party, and Lou Swift, a teenage physicist, along with their families and friends. Other characters are shown briefly as each one decides independently to break with the American status quo and begin living in an Ecotopian (low-tech, sustainable) fashion. ***Ecotopia Emerging*** is a prequel to Callenbach's classic ***Ecotopia,*** which is a multi-stranded novel that dramatizes the rise and triumph of a powerful American movement to preserve the earth as a safe, sustainable environment. The story springs from harsh realities: Toxic contamination of air, water, and food has become intolerable. Nuclear meltdowns threaten. Military spending burdens the economy. Politicians squabble over outdated agendas while the country declines. But then dedicated people begin to respond in their own ways to the crisis, and a fresh hope arises. A panorama of history about to happen, Ecotopia Emerging weaves many individual destinies into an absorbing epic: the birthing pains of a new nation.

The book takes the states of Washington, Oregon and Northern California and groups them into their own eco-region. It is a fictionalized account of economic versus ecological battles. One of the key factors is the development of a solar cell on the cheap and easy to reproduce. The book has the invention created by an 18 year-old woman. If such a cell has been designed, it probably rests on a back shelf in some oil company locker. There are some very good reasons to develop such a cell for use today - if all the tinkerers had some energy to spend in that direction. The politics is somewhat radical, but having been through the third party ringer with the Reform Party, Dr. Lenny can relate to the circumstances. The current one party with two faces system is just an old boy's network for fostering corporate bank accounts and feeding the war machine while Callenbach gets very close to the current Middle East status. The main idea of this book is, Callenbach uses a setting like our modern day civilized world, with pollutions, contaminations of streams, rivers, and ground waters by industrial toxic wastes. Doubtfully, after several years of this continuous contaminated way of living, he came up with a powerful and dedicated movement to preserve our future generations. In the book, he used Vera Allwen, a legislator as the organizer and the leader of the movement, assisted by a devoted Marissa D'Amico, her mother Laura, who organizes a group of Cancer victims to fight against plants making Carcinogenic chemicals. Finally, Lou Swift, a bright physics student who invented a unique Solar cell that would end the dependence on polluting fossil energy. Never the less, this movement was also joined by thousands of people, mostly commoners, who shared the same vision and values of their natural and traditional environment.

Bolinas, California, high school student Lou Swift was a bright physics student who loved working on her cell. One day after school, she opened her lab door and discovered that one of her cell had magical ingredients, which was rain and seawater, chlorides, and bromides. She could not find the replica of that exact magical cell, after series of experiments. She became frustrated and kicked the legs of the cell. She opened the cell's hut to look for any damage; one of the switches had fallen closed. Then she remembered that when she discovered the original cell, a switch had also fallen closed also, and one of the cells had salt water in it, it creates electrolytic reaction like chlorine, sodium hydroxide, and other compounds. Finally she did the experiment over, and then came up with the results like the original cell. She rushed the news to her father, Roger, who was proud of her. Since Lou wanted the cell to be do-it-yourself, to the public, it scared the hell out of companies who had been spending money on similar research and could not find the answer. She refuses to publish her results until she understands the science. Because she is determined to make the cell design freely available, she spurns corporate and academic offers to buy the cell design. Meanwhile, spies and burglars try to obtain her notes.

Vera Allwen is a California state senator. Angered by an Eastern food corporation’s announcement it would stop selling fresh produce, she and other politicians, artists, and professionals form a new political party. It is decentralized, environmentalist, and populist. They create a platform and name it the Survivalist Party. As the book proceeds, they spread their ideas, coalition with like-minded people, and become a regional political force. Vera’s speeches are reprinted within the text. Some of their ideas come from a short novel called Ecotopia, and the Party publishes a paper

called ‘The Survivalist Way to Ecotopia’ (Callenbach,1981, p.32.). The Party creates a think tank for environmentalist policies. When the Pacific Northwest states pass a special tax on cars to reduce car use, the U.S. Supreme Court overturns it; public outrage along the Pacific coast helps tip the people of the region toward supporting the Survivalist Party.

When the Quebec government offers to establish diplomatic relations, the Party starts thinking about independence. A nuclear accident gives them the governorship of Washington State, and Northern California's refusal to keep supplying Southern California with water leads to the state splitting into two. An ardent secessionist claims to have planted dirty bombs in New York City and Washington, DC, and threatens they will explode if the U.S. attacks the region. Bolinas declares itself independent of other governments. The Survivalist Party has infiltrated local units of the National Guard, which are now sympathetic to the secessionists. The U.S. is too busy with a war in Brazil to send troops to pacify Bolinas and its supporters. In a lucky coincidence, the U.S. helicopters massing on the Nevada border and preparing to attack the region are suddenly recalled to deal with a crisis in Saudi Arabia, and secession seems likely to proceed.

In the first three chapters of Ecotopia Emerging, the movement came up with a certain set of environmental rules or pacts between the human race and the ecosystem. It deals with extinction of species, nuclear plants, manufacturing of carcinogenic or mutagenic substances, no adulterating in food, no discrimination of sex, race, age, religion or ethnic group, no private cars, and advertiser controllers, no limited liability corporations, no absentee ownership, no growth in population etc..

Some of the rules were thought to be considered controversial in the public eyes, by some of the movement's members, for example, no private cars and growth in population. However, they stick to their rules and went to work by exposing government and private industries' evil deeds to the public for not making the earth a safer place to dwell. Drastically, the movement was popular due to it appearances on major TVs and in newspapers. In fact, they made their own TV channel for the convenience of their members who were in remote places.

Meanwhile, in the future Ecotopia, individuals move the local economy toward a more sustainable model. A collective sets up a solar remodelling business; a young man uses goats to mow lawns. Berkeley creates car-free zones; other cities adopt them. A suburban tract is replanted as an orchard. Rural residents build a lightweight, cheap horse-drawn buggy, and stills to distil alcohol from farm waste. Eventually, a large part of the public is car-free and ready to take the final steps to a sustainable economy.

Lou finally discovers the key chemical that makes her solar cell work. She publishes her paper and people start building their own cells. With this breakthrough, the region will no longer be dependent for energy on the rest of the U.S. for imported fossil fuels or nuclear power. With this energy independence, the future nation of Ecotopia becomes a practical possibility. These events occur against economic and political breakdown in the U.S.,corporate concentration, slashed government budgets, and military adventurism abroad, aided by a compliant corporate media. The automobile habit has essentially bankrupted the U.S. Refusing to develop alternative energy sources; oil-hungry-America lurched toward some unseen

economic catastrophe. At the end, the Saudi oil refineries have been bombed, and the U.S. military is caught up in a war in the Middle East. The Ecotopian storyline ends with the Party making Lou's solar cell technology available to the public, and a constitutional convention where the region decides to secede from the U.S. following the Quebec-Canada model.

In the end, after continuous battle with the government and other organizations, the survivalist party finally separated themselves from the union, but it wasn't easy, the only reason why they won and successfully gained their independent country was the U.S military troops that were camped in Nevada was moved to the Middle East, due to immediate needs for troops over there.

2.6. COMPARATIVE ANALYSIS OF 'ECOTOPIA' AND 'ECOTOPIA EMERGING':

The return of utopian thought and writing during and after the radical questioning of the '60s is one of the most notable phenomena in contemporary American culture. Utopianism from these years puts the dystopian situation into a causal relationship with humanity's responsibilities. In the utopian fictions of Ernest Callenbach, environmental dangers are used as levels to promote social change. The absolute priority of the community over the individual suggests an ideology of humanistic collectivism. The ensuing dilemma of happiness and freedom is made worse by Callenbach's belief that the solution to environmental problems can found only in the total social control of the metabolism between humanity and nature. Callenbach, in Ecotopia, follows the model of classical utopias. Thus the utopian locus is described as an isolated and static entity, which is then identified with the utopian horizon.

There is, however, a dynamic element in *Ecotopia Emerging*, where the emphasis is upon how an ecologically sensible society might come about. Hence, there is a multiplication of plot lines, symbolizing the unpredictable of the historical process. What Callenbach suggests is that Ecotopia comes about through a process of self-organization, which is paralleled in disequilibrium physics by the concept of dissipative structures. As a prequel to *Ecotopia, Ecotopia Emerging* uses some of the same characters as Ecotopia, principally Vera Allwen and Marissa D'Amato (later the girlfriend of Ecotopia's narrator). However, there are important differences between the books. A few differences are as follows:-

1. *Ecotopia* is the account of a trip to Ecotopia by a U.S. reporter, William Weston, and is told entirely from his point of view. *Ecotopia Emerging* alternates a straightforward narrative history of the United States and the Survivalist Party with novelistic snapshots of key events in the lives of some future Ecotopians.

2. *Ecotopia* was written in the middle 1970s, when American writers were trying to imagine how to reconstruct society after the 1960s revolutions. It focuses on the achieved Ecotopian society, not on the problems of the (remaining) United States. *Ecotopia Emerging* was published in 1981 and has a darker tone. It focuses as much on the dysfunctional U.S. political and economic system as it does on the actions of the future Ecotopians. Most of its 'predictions' for the U.S. future have turned out to be prescient, such as "From the eighties onward the business mentality triumphed." (Callenbach, 1975, p. 42)

3. *Ecotopia* describes a steady-state society. Only the narrator changes as the book progresses. *Ecotopia Emerging* is a history; its characters, institutions and society change over time.

4. *Ecotopia* has only represented the life in Northern California whereas *Ecotopia Emerging* has a broader scope, and includes all three states.

Despite the differences in the layout of both the novels, there is a wide similarity in the novels which is to deal with the environmental changes and in providing alternative ways to harness the future.

Since the 1970s, the trend to decentralize forest and farm management that happened in Ecotopia through Callenbach's vision has become reality in many of the world's developing nations as governments have passed more authority to regional and local governments. While governments still own and manage the majority of the world's forests, more than 200 million hectares of forests have come under communal management since the 1980s; today, around 25% of tropical forests are communally managed in some form or fashion. Many nations have embraced decentralized conservation policies, including Bolivia, Peru, Uganda, Rwanda, among others. In Ecotopia, decentralization was so radical that the national government did not regulate much at all, instead relying on scientific knowledge and people's desire for a healthy environment. For example, processed and packaged foods were put on a Bad Practices list, and when Weston asked how they were enforced, the Assistant Minister of Food replied, "*They aren't enforced at all. They're a mechanism of moral persuasion, you might say. They're issued by study groups from consumer co-*

ops. Usually when a product goes on such a list, demand for it drops sharply"(Callenbach,1975, p.21). People living in Ecotopia embraced ideals they believed worked, and made them happen.

2.7. CONCLUSION

The theory and knowledge from Callenbach's books would help release and confirm deeper intuitions within us of the essential Humanity-Nature bond that have been repressed in our cultural development. It is through the balanced combination and cooperation of science and religion that humanity can be allowed to acquire a genuine humility and respect for Nature while applying the appropriate skills and technologies needed to advance civilization. In terms of both our spiritual growth and our common dependence on the ecosphere, we are called to be, fully and consciously, citizens of one Earth home. The overarching vision for the changes in values, institutions, and social forms that are part of developing an ecologically sustainable society is the emergence of a new system of world.

Inevitably, given the history of civilization, the prevailing social order is seen as the symbolic expression of the male ego and its tendencies towards rationality and competitiveness. Qualities of nurturance, intuition, and emotional sensitivity, which are associated in popular thought with the feminine principle, however, are the qualities most needed to heal our relationship to Nature. It is not surprising that the expansion of environmental awareness and the movement for women's equality have been parallel developments, as is the practice in Ecotopia and Ecotopia Emerging. Equality and balance are two main factors followed by Callenbach.

It is now becoming apparent in world affairs that collective order at the planetary level is necessary for not only effectively tackling environmental problems but also redressing the disparities that have relegated masses of humanity to poverty, despair, and tragic displacement caused by war and environmental degradation. The establishment of norms of unity, mutuality, and cooperation for the human family as a whole is necessary to create the climate both for sharing material well-being and also for fostering the development of the full potential of each individual.

It is within the context of this iterative process of social change, allied with the application of scientific knowledge guided by spiritual principles, which truly sustainable models of production and habitation can emerge. In other words, the advancement of a new set of values in relation to nature and the unfolding of a global order that can effectively address environment and development issues both depend on the enhancement of the only infinite resource in the face of depleting material resources the human potential and universal brotherhood for respect for the ecosystem.

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CHAPTER III

MURRAY BOOKCHIN AND THE FREEDOM FROM CAPITALISM

3.1 ENVIRONMENTAL MOVEMENTS AROUND THE WORLD

With the increase in ecological crisis, there has been a corresponding increase in the awareness and concern about it all over the world. This has, in turn, led to widespread protest movements by aggrieved communities and concerned citizens.

Bhopal gas tragedy in 1984, nuclear disaster at Chernobyl (Russia) in 1986, Alaskan oil spill from Exxon Valdez tanker in 1989, and the Gulf War in the early 1990s are some examples of hazardous and undesirable happenings that led to ecological crisis in the human history. Late 20th century (near about the early 1970s) concern about the impact of human activities on the environment has resulted in new social, political and ecological movement and the growing salience of so-called **green issue**. It has given rise to a steady growth of environmental-ecological movement all over the world, including India. These movements have been put under the category of new social movements, because they were not class-based and do not raise any economic issue like earlier agrarian or industrial movements. Such movements were a resurgence of an interest of the people in their natural environment.

In the early decades of the last century, a conservation movement grew up to conserve such rapidly depleting natural resources as forests. More recently efforts to protect various birds and animals in danger of extinction by human predators led to the enactment of concerned laws in many countries. These developments have boosted the formation of many environmental protection and preservation

organizations, such as *Green Network* or the *Greenpeace* or *Friends of the Earth* (1969) throughout the world, including India. Guha and Gadgil (1989) defined the environmental movements as 'organized social activity consciously directed towards promoting sustainable use of natural resources halting environmental degradation or bringing about environmental restoration'(Guha and Gadgil, 1989, p.30). In the West environmental movements focus on consumption, productive use of natural resources and conservation or protection of natural resources. In India, such movements are based on the use of, as well as control over, natural resources.

The first conference on human environment initiated by UNO was held at Stockholm in 1972. It paved the way for the studies on the condition of the environment and its effects on human beings. It expressed serious concern to protect and improve the environment for present and the future generations. As a result of these conference environmental movements under different names such as *Green Polities*, *Eco-greens* or *Green Movement* (Germany and North America) developed in the 1980s. First scien-tific warning of serious depletion of protective ozone layer in upper atmosphere by CFCs was raised during the Stockholm Conference (1972). The 1989 European elections (1989) put green issues firmly on political agenda as Green parties across Europe gave top priority to this in their election campaign. In 1992, the United Nations Earth Summit was held in Rio de Janeiro to discuss the issues of environmental crisis faced by almost all developed and developing nations. In this conference, about 1,000 NGOs and about 50,000 individuals participated from all over the world. The issues of climate change and loss of biodiversity dominated the conference. A list of 27 principles was framed to preserve and improve the environment.

The various programmes of UNO, specially the UNEP, have emphasized the need for sustainable development. It is agreed upon that environment and devel-opment are for the people and not people for environment and development. A parallel informal group assembled at Flamingo Park and formed a global forum on environment under the president ship of Morris Strong in 1972.

3.1.1. ENVIRONMENTALISM

Environmentalism is a political and ethical movement that seeks to improve and protect the quality of the natural environment through changes to environmentally harmful human activities; through the adoption of forms of political, economic, and social organization that are thought to be necessary for, or at least conducive to, the benign treatment of the environment by humans; and through a reassessment of humanity's relationship with nature.

Environmental thought and the various branches of the environmental movement are often classified into two intellectual camps: those that are considered anthropocentric, or human-centred, in orientation and those considered bio-centric, or life-centred. This division has been described in other terminology as **shallow ecology** versus **deep ecology** and as **techno-centrism** versus **eco-centrism.** Anthropocentric approaches focus mainly on the negative effects that environmental degradation has on human beings and their interests, including their interests in health, recreation, and quality of life. It is often characterized by a mechanistic approach to nonhuman nature in which individual creatures and species have only an instrumental value for humans. The defining feature of anthropocentrism is that it considers the moral obligations humans have to the environment to derive from

obligations that humans have to each other and, less crucially, to future generations of humans-rather than from any obligation to other living things or to the environment as a whole. Human obligations to the environment are thus indirect. Critics of anthropocentrism have charged that it amounts to a form of human 'chauvinism' (Singer,1990, p.31). They argue that anthropocentric approaches presuppose the historically Western view of nature as merely a resource to be managed or exploited for human purposes- a view that they claim is responsible for centuries of environmental destruction. In contrast to anthropocentrism, biocentrism claims that nature has an intrinsic moral worth that does not depend on its usefulness to human beings, and it is this intrinsic worth that gives rise directly to obligations to the environment. Humans are therefore morally bound to protect the environment, as well as individual creatures and species, for their own sake. In this sense, biocentrics view human beings and other elements of the natural environment, both living and often nonliving, as members of a single moral and ecological community.

By the 1960s and '70s, as scientific knowledge of the causes and consequences of environmental degradation was becoming more extensive and sophisticated, there was increasing concern among some scientists, intellectuals, and activists about the Earth's ability to absorb the detritus of human economic activity and, indeed, to sustain human life. This concern contributed to the growth of grassroots environmental activism in a number of countries, the establishment of new environmental nongovernmental organizations, and the formation of environmental (green) political parties in a number of Western democracies. As political leaders gradually came to appreciate the seriousness of environmental problems, governments entered into negotiations in the early 1970s that led to the adoption of a

growing number of international environmental agreements. The division between anthropocentric and bio-centric approaches played a central role in the development of environmental thought in the late 20th century. Whereas some earlier schools, such as apocalyptic (survivalist) environmentalism and emancipatory environmentalism- as well as its offshoot, human-welfare ecology- were animated primarily by a concern for human well-being, later movements, including social ecology, deep ecology, the animal-rights and animal-liberation movements, and ecofeminism, were centrally concerned with the moral worth of nonhuman nature.

3.1.2. BIOCENTRIC SCHOOLS OF THOUGHT: SOCIAL ECOLOGY AND DEEP ECOLOGY

An emphasis on small-scale economic structures and the social dimensions of the ecological crisis also is a feature of the school of thought known as social ecology, whose major proponent was the American environmental anarchist Murray Bookchin. Social ecologists trace the causes of environmental degradation to the existence of unjust, hierarchical relationships in human society, which they see as endemic to the large-scale social structures of modern capitalist states. Accordingly, they argue, the most environmentally sympathetic form of political and social organization is one based on decentralized small-scale communities and systems of production.

A more radical doctrine, known as deep ecology, builds on preservationist themes from the early environmental movement. Its main originators, the Norwegian philosopher Arne Naess, the American sociologist Bill Devall, and the American philosopher George Sessions, share with social ecologists a distrust of capitalism

and industrial technology and favour decentralized forms of social organization. Deep ecologists also claim that humans need to regain a spiritual relationship with nonhuman nature. By understanding the interconnectedness of all organisms-including humans-in the ecosphere and empathizing with nonhuman nature, they argue, humans would develop an ecological consciousness and a sense of ecological solidarity.

3.1.3. HISTORY OF THE ENVIRONMENTAL MOVEMENT

The concern for the impact on human life of problems such as air and water pollution dates to at least Roman times. Pollution was associated with the spread of epidemic disease in Europe between the late 14th century and the mid 16th century, and soil conservation was practiced in China, India, and Peru as early as 2,000 years ago. In general, however, such concerns did not give rise to public activism.

The contemporary environmental movement arose primarily from concerns in the late 19th century about the protection of the countryside in Europe and the wilderness in the United States and the health consequences of pollution during the Industrial Revolution. In opposition to the dominant political philosophy of the time, liberalism- which held that all social problems, including environmental ones, could and should be solved through the free market- most early environmentalists believed that government rather than the market should be charged with protecting the environment and ensuring the conservation of resources. An early philosophy of resource conservation was developed by Gifford Pinchot (1865–1946), the first chief of the U.S. Forest Service, for whom conservation represented the wise and efficient use of resources. Also in the United States at about the same time, a more strongly

bio-centric approach arose in the preservationist philosophy of John Muir (1838–1914), founder of the Sierra Club, and Aldo Leopold (1887–1948), a professor of wildlife management who was pivotal in the designation of Gila National Forest in New Mexico in 1924 as America's first national wilderness area. Leopold introduced the concept of a land ethic, arguing that humans should transform themselves from conquerors of nature into citizens of it; his essays, compiled posthumously in A Sand County Almanac (1949), had a significant influence on later bio-centric environmentalists.

Environmental organizations established from the late 19th to the mid 20th century were primarily middle-class lobbying groups concerned with nature conservation, wildlife protection, and the pollution that arose from industrial development and urbanization. There were also scientific organizations concerned with natural history and with biological aspects of conservation efforts.

Beginning in the 1960s the various philosophical strands of environmentalism were given political expression through the establishment of green political movements in the form of activist nongovernmental organizations and environmentalist political parties. Despite the diversity of the environmental movement, four pillars provided a unifying theme to the broad goals of political ecology: protection of the environment, grassroots democracy, social justice, and nonviolence. However, for a small number of environmental groups and individual activists who engaged in eco-terrorism, violence was viewed as a justified response to what they considered the violent treatment of nature by some interests, particularly the logging and mining industries. The political goals of the contemporary green movement in the

industrialized West focused on changing government policy and promoting environmental social values. In the less-industrialized or developing world, environmentalism has been more closely involved in emancipatory politics and grassroots activism on issues such as poverty, democratization, and political and human rights, including the rights of women and indigenous peoples. Examples of such movements include the ***Chipko*** **movement** in India, which linked forest protection with the rights of women, and the Assembly of the Poor in Thailand, a coalition of movements fighting for the right to participate in environmental and development policies.

The early strategies of the contemporary environmental movement were self-consciously activist and unconventional, involving direct-protest actions designed to obstruct and to draw attention to environmentally harmful policies and projects. Other strategies included public-education and media campaigns, community-directed activities, and conventional lobbying of policy makers and political representatives. The movement also attempted to set public examples in order to increase awareness of and sensitivity to environmental issues. Such projects included recycling, green consumerism (also known as buying green), and the establishment of alternative communities, including self-sufficient farms, workers' cooperatives, and cooperative-housing projects.

3.1.4. HISTORY OF ENVIRONMENTALISM

As we look into the history of environmentalism, we can say that the concern for the protection of environment has recurred in different forms, in several parts of the world, long time ago. In the Middle East, writing that mainly concerns with

environmental pollution were found in Arabic medical treatises and were written during the Arab Agricultural Revolution. They were primarily concerned with air, water, soil contamination, solid waste mishandling as well as environmental assessments of certain localities. We can say that this was the beginning of environmentalism.

Looking at the environmentalism history, Edward I, the king of England also banned or prohibited the burning of sea coal in 1272 after its smoke became a main problem. Considering the origin of environmentalism, in Europe, the first large scale, current environmental laws came into being in the form of British Alkali Acts. The laws were passed in the year 1863 in order to regulate harmful air pollution given off by the Leblanc process which was used to produce soda ash. With the growth of industrialization air and water pollution also increase. In the history of environmentalism, the beginning of environmental movement in United States can be dated back to 1739 when Benjamin Franklin as well as other Philadelphia residents cited ‘public rights’ (Gopinath,2008,p.18), requested the Pennsylvania Assembly to stop or restrict waste dumping as well as for removing workplaces from Philadelphia's commercial district. The US movement continues till 1800s with the concerned for the protection of natural resources of the West. John Muir and Henry David Thoreau were the main philosophical contributors to this movement.

In the history of environmentalism, environmental ideas became more popular with the beginning of 20th century. During this century efforts were being made to save wildlife and National Park Service was formed in 1916 by US president Woodrow Wilson. In 1972, the United States Environmental Protection Agency banned the

agricultural use of DDT. People become more concerned with the problems of air pollution and petroleum spills as well as environmental interest grew in larger number. In India *Chipko* movement was formed in the year 1970. In 1979, James Lovelock, the former NASA scientist, published *Gaia: A new look at life on Earth*. Now, environmentalism has also changed to deal with new issues such as global warming and genetic engineering.

3.1.5. CONSERVING NATURAL RESOURCES

Resources are features of environment that are important and value of human in one form or the other. However, the advancement of modern civilization has had a great impact on our planet's natural resources. So, conserving natural resources is very essential today. There are many ways that one can conserve natural resources. All you need to do is to look around and see what natural resources you are using and find out ways to limit your usage. Most of the people use natural gas to heat their water and their home. You can monitor how much you are using this resource to minimize its usage.

For conservation of natural resources like natural gas, one can get tank less water heater as it reduces the usage of natural gas. The other way to save natural gas is the use of another energy source for instance hydro, solar or wind power are all healthy and great alternatives to conserving natural resources. In fact these energy sources are clean and healthy for environment. Moreover, these energy sources do not emit or produce harmful gases or toxin into our environment like that of the burning fossil fuels at the same time they are renewable as well as are not easy to deplete.

Today, most of the people are finding many ways for conserving natural resources. One of the great option before is Hydro-power and solar power. Power can be generated from these sources and these are the best ways for natural resources conservation like fossil fuels. There is also way to conserve natural resource like trees. It can be conserved through recycling process. Many products come from the trees like papers, cups, cardboards and envelopes. By recycling these products you can reduce the number of trees cut down a year. One should make the most use of these paper products without being wasteful and then recycle them. This is one great way for conserving natural resources.

Fossil fuels on Earth will not last forever; we need to conserve these fossil fuels. To conserve fossil fuels one can choose to buy a hybrid car. Some of these cars will run on electricity combined with using small amounts of gas. Some hybrid cars just run on electricity. Either way it is a great way for conserving natural resources when it is concerned with fossil fuels.

3.2 THE REVOLUTIONARY POLITICS OF MURRAY BOOKCHIN

Murray Bookchin (1921-2006) was one of the most insightful and controversial anarchist thinkers of the mid to late twentieth century. His ideas on localized, self-governed communities seem particularly insightful today, as the strains of globalization and resource depletion has made **thinking local** a viable plan for future societal sustainability. A pioneer in the ecology and conservation movements, Murray Bookchin was also a libertarian socialist whose ideas on the social role of anarchism put him at violent (at least verbally) odds with a new generation of anti-capitalists who focused more on personal rebellion than social action. Bookchin

describes that social ecology is based on the conviction that nearly all of our present ecological problems originate in deep-seated social problems. It follows, from this view, that these ecological problems cannot be understood, let alone solved, without a careful understanding of our existing society and the irrationalities that dominate it. To make this point more concrete: economic, ethnic, cultural, and gender conflicts, among many others, lie at the core of the most serious ecological dislocations we face today- apart, to be sure, from those that are produced by natural catastrophes.

Murray Bookchin is a living testament to the triumphs and failures of the American Left of the century. A vital link between the old and the new Left and beyond, Bookchin's work has evolved in response to the turbulent eras in which he lived. Bookchin was a part of the traditional Left in the United States during the 1930s, in which the twin evils of Stalinism and McCarthytism only reinforced his radicalism and pushed him further towards Left. Bookchin, began in 1950s, to develop a creative synthesis of anarchist and ecological theories while participating in numerous social and ecological movements. His linkage of ecology and revolutionary politics came at a time when the Left tended to reject the ecology as a trivial or diversionary bourgeois concern. As a result of his creative rethinking of the European and American radical traditions, Bookchin fused ecology and anarchism into an original theory which he calls eco-anarchism or social ecology, which is an alternative to liberalism, Marxism, postmodern theory and other ecological theories such as ecofeminism and deep ecology.

In the early 1960s new threats to human health appeared to be everywhere. Giant cities were sites of mounting air and water pollution; poisoned air and water too were giving rise to physical illness. Just living in oversized cities was a source of unremitting stress, and stress (it was just coming to be understood) had negative health effects. Huge cities- megalopolis- were causing another, longer-term problem. They were dependent on the use of fossil fuels. But fossil fuels, he wrote in 1964, were producing something called the greenhouse effect: This growing blanket of carbon dioxide, by intercepting heat radiated from the earth into outer space, will lead to rising atmospheric temperatures, to a more violent circulation of air, to more destructive storm patterns, and eventually to a melting of the polar ice caps (possibly in two or three centuries), rising sea levels, and the inundation of vast land areas. Far removed as such a deluge may be, the changing proportion of carbon dioxide to other atmospheric gases is a warning of the impact man is having on the balance of nature. Such a planet was not a place where people could survive. Ordinary people, Bookchin was convinced, would not stand for it. They would not tolerate these widespread and systematic assaults on their health, on the integrity of their bodies. They would not stand for the destruction of the environment by the greenhouse effect. In the interests of sheer survival, they would rise up against the system that was producing all these effects. The limit to capitalism was not, as Marx had argued, the immiseration of the proletariat; it was the erosion of human health. A society without capitalism would be one that was humanly scaled, in which town and country were integrated; in which farming was local and part of everyday life.

Unlike fossil fuels, which are integral to massively scaled conurbations, these alternative sources of energy lend themselves to decentralized generation and

ownership. They can be used at a community scale in solar panels and wind turbines, in small hydro, geothermal plants. Starting in the early 1960s, Murray argued that solar, wind, and tidal energy were suited to small-scale, self-managed, and decentralization of self-managed communities. But social ecology, as he soon called this body of ideas, did not mean a return to benighted medieval-style peasantry. Thanks to modern manufacturing technology- which Bookchin saw as mostly positive- labour and toil could be eliminated. People would not have to work, because machines would do the work. They would be free to be creative.

He was a fervent champion of the Enlightenment's values of reason and humanism. As a humanist, he opposed misanthropy in the ecology movement. It became fashionable to blame human beings as such for destroying nature. Bookchin argued that on the contrary, we depend on human ingenuity and creativity to find solutions to the crisis. In a world that no longer values coherence, Bookchin dared to be coherent. As a result, his ideas have an internal logic. As a developed social outlook with a broad critique of hierarchy, capitalism, and the state, it points to a utopian alternative and reminds us what a good society could look like, and the social generosity of which human beings are capable. The ethical revolt against capitalism speaks to a craving for meaning and appeals to virtuous human agency.

Possessed of the idealism and moral imagination to power change, he kept the long-range end steadily in sight. Combustible and ebullient, he cared more for the big picture, the large goals, than for the details. In a risk-averse society, he cared nothing for risking his reputation. He did not desire to impress or fear the disapproval of others. Despite massive countervailing social forces, he sustained the utopian

temper. He understood that while success could not be immediate, the choices we face are apocalyptic.

Bookchin carried the discussion considerably further, proposing that ecological thought is not merely 'subversive', but fundamentally revolutionary and reconstructive. With the world wars and Great Depression of the 20th century appearing to have only strengthened global capitalism, Bookchin saw the emerging ecological crisis as one challenge that would fundamentally undermine the system's inherent logic. His first book, *Our Synthetic Environment* (1962), was comparable in its influence to Rachel Carson's *Silent Spring* (1962). *Our Synthetic Environment* offered a detailed and accessible analysis of the origins of pollution, urban concentration, and chemical agriculture.

In *The Ecology of Freedom*, Bookchin examined the anthropological literature of the 1970s and 1980s, seeking principles and practices that emerge from our understanding of non-hierarchical **organic** societies. These core principles included interdependence, usufruct, unity-in-diversity, complementarity, and the irreducible minimum: the principle that communities are responsible for meeting their members' most basic needs. Complementarity for Bookchin meant disavowing the oppressive inequality of supposed equals within contemporary societies, instead invoking traditional communities' ability to compensate for differences in ability among members. Technology has never been an end in itself, nor an autonomous principle of human evolution, but rather a reflection of an evolving social matrix. Bookchin's historical and anthropological investigations affirmed his belief that any truly liberatory popular movement must challenge hierarchy in general, not just its

particular manifestations as oppression by race, gender or class. His explorations of the persistent role of social hierarchies in shaping social evolution and our relationships with non-human nature led Bookchin further toward a philosophical inquiry into the evolutionary relationship between human consciousness and natural evolution. He sought to renew the legacy of dialectical philosophy, abandoning popular oversimplifications and reinterpreting dialectics from its origins in the works of philosophers from Aristotle to Hegel. Bookchin's dialectical naturalism emphasizes the potentialities that lie latent within the evolution of natural and social phenomena, and celebrates the uniqueness of human creativity, while emphasizing its emergence from the possibilities inherent in 'first nature' (Bookchin, 1982, p.48). It eschews the common view of nature as merely a realm of necessity, instead viewing nature as striving to actualize its underlying potentiality for consciousness, creativity and freedom.

While continuing to develop and clarify his philosophy of nature, Bookchin also developed a distinct approach to political praxis, one aimed at realizing the ecological reconstruction of society. Bookchin's libertarian municipalism draws on what he viewed as a fundamental underlying conflict between communities and the state as well as on historical examples of emerging direct democracies from the Athenian polis to the New England town meeting. Bookchin sought a redefinition of citizenship and a reinvigoration of the public sphere, with citizen assemblies moving to the centre of public life in towns and neighbourhoods and taking control of essential political and economic decisions. Representatives in city councils and regional assemblies would become mandated delegates, deputized by their local assemblies and empowered only to carry out the wishes of the people. Bookchin

embraced the historical role of cities as potential sites of freedom and universalism and viewed the practice of citizenship in empowered neighbourhood assemblies as a means for educating community members into the values of humanism, cooperation, and public service.

Again in *Remaking Society* (1990), Bookchin faces down some of the eco-fascist tendencies within the environmental movement. Remaking Society arises from a need felt by Bookchin to argue against some frequently expressed sentiments heard from members of the environmental movement. Specifically, Bookchin sought to argue against the environmentalist notion that we, humanity, in general, destroyed the environment. Bookchin believed that sentiments which charge humanity in general as a destructive leviathan are too wide in their focus when, according to Bookchin, it is important to consider the nuances in how class is constructed with regards to environmental devastation. Bookchin argues that humanity as a whole is not responsible for the wearing down of the environment but rather there are particular classes and agencies within the broad human family that manage societies in such a way that is destructive to nature. Bookchin's basic premise in *Remaking Society* is that man's subjection of man precedes man's subjection of nature. Much of his book describes how various cultures have constituted their society, and the concepts of freedom deployed within particular societies and the degrees to which those concepts are applied to the different categories of social subjects. Bookchin describes the history of society and freedom in detail in order to claim that the modes of social construction he identifies are far from natural or necessary and that there are possible alternative social models which may eliminate both man's subjection of man, and man's subjection of nature. Bookchin is a strong advocate of

ecology, in society and in nature, which he describes as a balance through diversity. *Remaking Society* proposes to put a concept of social ecology into practice for the benefit of humanity and the environment. The book is also an argument that the destruction of the environment is not simply a result of consuming products, but is a necessary result of the way our society is managed for the benefit of capitalist producers.

Bookchin argues against the anti-humanist and mystical tendencies in the modern environmental movement, making the claim that 'nearly all ecological problems are social problems' (Bookchin, 1990,p.55), that have arisen out of the hierarchy and domination that humans engage in over each other. He traces the emergence of hierarchy out of primitive tribal society through domination of tribes by elders, through the rise of warrior castes, cities, and finally the modern nation state and capitalism. He traces the parallel development of social structures of freedom that constantly emerged and was submerged as hierarchy took over from the Athenian polis to the city-state of the Middle Ages, millenarian Christian movements, and modern worker's movements up through the New Left of the 1960s. He makes a powerful case for the possibility of a decentralized, directly democratic, and ecologically sustainable social order organized in a federated system of local libertarian municipalities. Unfortunately, his vision of how to get 'From Here to There' (Bookchin, 1990, p.67) is fairly thin gruel- a vague picture of the grassroots takeover of local governments through electoral organizing.

Bookchin's *Post-scarcity Anarchism*(1971) is an economic system based on social ecology, libertarian municipalism, and an abundance of fundamental resources.

Bookchin argues that post-industrial societies have the potential to be developed into post-scarcity societies, and can thus imagine 'spontaneity in social life converges with spontaneity in nature to provide the basis for an ecological society' (Bookchin,1971, p.23.). The self-administration of society is made possible by technological advancement and, when technology is used in an ecologically sensitive manner, the revolutionary potential of society will be much changed. Bookchin claims that the expanded production made possible by the technological advances of the twentieth century were in the pursuit of market profit and at the expense of the needs of humans and of ecological sustainability. The accumulation of capital can no longer be considered a prerequisite for liberation, and the notion that obstructions such as the state, social hierarchy, and vanguard political parties are necessary in the struggle for freedom of the working classes can be dispelled as a myth.

3.3. DIMENSIONS OF SOCIAL ECOLOGY

Bookchin's theory of social ecology emerged from a time in the mid-1960s when ecological thought, and even ecological science, were widely viewed as 'subversive'(Bookchin,1982, p.34). Even relatively conventional environmental scientists were contemplating the broad political implications of an ecological world view, confronting academic censorship, and raising challenging questions about the widely accepted capitalist dogma of perpetual economic growth.

Social ecology claims that the environmental crisis is a result of the hierarchical organization of power and the authoritarian mentality rooted in the structures of our society. The Western ideology of dominating the natural world arises from these

social relationships. What should be could become what must be, if humanity and the biological complexity on which it rests were to survive. Change and reconstruction could emerge from existing problems rather than wishful thinking and misty vagaries (Bookchin,1982, p.3). The alternative is society based on ecological principles; an organic unity in diversity, free of hierarchy & based on mutual respect for the interrelationship of all aspects of life. If we change human society then our relationship with the rest of nature will become transformed.

The core principle of social ecology is that ecological problems arise from deep-seated social problems. Ecological problems cannot be understood, much less resolved, without facing social issues. Social hierarchy and class legitimize our domination of the environment and underpin the consumer system. 'The root causes of environmental problems are such as trade for profit, industrial expansion, and the identification of progress with corporate self-interest.' (Bookchin,1982, p.7).

At its most outward level, social ecology confronts the social and political roots of contemporary ecological problems. It critiques the ways of conventional environmental politics and points activists toward radical, community-centred alternatives. Bookchin always insisted that ecological issues be understood primarily as social issues and was impatient with the narrowly instrumental approaches advanced by conventional environmentalists to address particular problems. The holistic outlook of ecological science, he argued, demands a social ecology that examines the systemic roots of our ecological crisis while challenging the institutions responsible for perpetuating the status quo.

In *The Ecology of Freedom*, Bookchin examined the anthropological literature of the 1970s and 1980s, seeking principles and practices that emerge from our understanding of non-hierarchical 'organic' societies (Bookchin,1971, p.318). These core principles included interdependence, usufruct, unity-in-diversity, complementarity, and the irreducible minimum: the principle that communities are responsible for meeting their members' most basic needs. As human beings evolved they established traditional societies organised around communitarian norms and simple life ways. Bookchin identifies the earliest social form as organic societies, and the task of social ecology is to clarify their nature, to analyze their transformation into hierarchical societies, and to identify what is positive and of enduring import for a non-hierarchical society of the future.

His explorations of the persistent role of social hierarchies in shaping social evolution and our relationships with non-human nature led Bookchin further toward a philosophical inquiry into the evolutionary relationship between human consciousness and natural evolution. He sought to renew the legacy of dialectical philosophy, abandoning popular oversimplifications and reinterpreting dialectics from its origins in the works of philosophers from Aristotle to Hegel. Bookchin's dialectical naturalism emphasizes the potentialities that lie latent within the evolution of natural and social phenomena, and celebrates the uniqueness of human creativity, while emphasizing its emergence from the possibilities inherent in first nature.

Bookchin also developed a distinct approach to political praxis, one aimed at realizing the ecological reconstruction of society. Bookchin's libertarian

municipalism draws on what he viewed as a fundamental underlying conflict between communities and the state as well as on historical examples of emerging direct democracies from the Athenian polis to the New England town meeting. Bookchin sought a redefinition of citizenship and a reinvigoration of the public sphere, with citizen assemblies moving to the centre of public life in towns and neighbourhoods and taking control of essential political and economic decisions. Representatives in city councils and regional assemblies would become mandated delegates, deputized by their local assemblies and empowered only to carry out the wishes of the people. Bookchin embraced the historical role of cities as potential sites of freedom and universalism and viewed the practice of citizenship in empowered neighbourhood assemblies as a means for educating community members into the values of humanism, cooperation, and public service (Bookchin, 1987, p.39).

3.4. SOCIAL ECOLOGY AND SOCIAL MOVEMENTS

The influence of ideas upon popular ecological movements began with the underground distribution of Bookchin's essays during the 1960s. Ideas he first articulated, such as the need for a fundamentally radical ecology in contrast to technocratic environmentalism (Leopold, 1987,p.7, were embraced by the growing ranks of ecologically informed radicals. Bookchin and his colleagues, including Institute for Social Ecology co-founder Daniel Chodorkoff, also participated in some of the earliest efforts to plan for the greening of cities and bring alternative, solar-based technologies into inner city neighbourhoods. By the late 1970s, social ecology was playing a much more visible role in the rapidly growing movement against

nuclear power. Utility and state officials were identifying rural communities across the U.S. as potential sites for new nuclear power plants, and the movement that arose to counter this new colonization of the countryside united rural back-to-the-landers, seasoned urban activists, and a new generation of radicals who only partially experienced the ferment of the 1960s. Following the mass arrest of over 1400 people who sought to non-violently occupy a nuclear construction site in Seabrook, New Hampshire in 1977, decentralized antinuclear alliances began to appear all across the U.S. These alliances were committed to nonviolent direct action, bottom-up forms of internal organization, and a sophisticated understanding of the relationship between technological and social changes. They were captivated by the utopian dimension of the emerging appropriate technology movement for which Bookchin and other social ecologists provided an essential theoretical and historical grounding. Over a hundred students came to the Institute for Social Ecology (ISE) in Vermont every summer to acquire hands-on experience in organic gardening and alternative technology while studying social ecology, ecofeminism, reconstructive anthropology, and other political and theoretical topics.

By the early 1980s, Bookchin and other social ecologists began to closely follow the emergence of a new Green political movement in West Germany and other European countries. Social ecologists became excited about this new 'anti-party' (Bookchin, 1990, p.87) that initially functioned more as an alliance of grassroots 'citizen initiatives' than a conventional parliamentary vehicle. In the early 1980s, European Greens were running for office as delegates from various social movements, decisions were made primarily at the local level, and those elected to public offices or internal positions of responsibility were obliged to rotate their

positions every two years. Greens in Germany and other countries were articulating a sweeping ecological critique in all areas of public policy, from urban design, energy use and transportation to nuclear disarmament and support for emerging democratic movements in Eastern Europe.

3.5. SOCIAL ECOLOGY AND THE FUTURE OF SOCIETY

Today, with a growing awareness of global warming and the profound social and ecological upheavals that may likely be upon us, environmental politics once again appears ascendant. But most often it is the same narrowly instrumental environmentalism that Bookchin critiqued in the 1960s and seventies. 'Green consumerism' (Bookchin, 1987, p.36) which first emerged as a national phenomenon around the 1990 Earth Day anniversary, has returned with a vengeance, incessantly promoted as the key to reducing our personal impact on the climate. It is useful to consider some of the particular ways that social ecology may continue to inform and enlighten today's emerging social and environmental movements.

First, social ecology offers an uncompromising ecological outlook that challenges the supremacy of capitalism and the state. A movement that fails to confront the underlying causes of environmental destruction and climate disruption can, at best, only superficially address those problems. At worst, capitalism offers false solutions such as carbon trading and the worldwide production of so-called biofuels to replace gasoline and diesel fuel that only aggravate problems in the longer term. Ultimately, to fully address the causes of climate change and other compelling environmental problems requires us to raise visionary demands that the dominant economic and political systems will likely prove unable to accommodate.

Second, social ecology's 40-year evolution offers a vehicle to better comprehend the origins and the historical emergence of ecological radicalism, from the nascent movements of the late 1950s and early sixties to the eco-saturated present. Over four decades, the writings of Murray Bookchin and his colleagues reflected upon the most important on-the-ground debates within ecological and social movements with passion and polemic, as well as with humour and long-range vision.

Third, social ecology offers the most comprehensive theoretical treatment of the origins of human social domination and its historical relationship to abuses of the earth's living ecosystems. Social ecology has consistently pointed to the origins of ecological destruction in social relations of domination, in contrast to conventional views that an impulse to dominate non-human nature is a product of mere historical necessity.

Fourth, social ecology presents a framework for comprehending the origins of human consciousness and the emergence of human reason from its natural context. Dialectical naturalism reaches far beyond popular, often solipsistic notions of an ecological self, grounding the embeddedness of consciousness in nature in a coherent theoretical framework with roots in classical nature philosophies. It offers a philosophical challenge to overturn popular acceptance of the world as it is, and to persistently inquire as to how things ought to be.

Fifth, social ecology offers activists an historical and strategic grounding for political and organizational debates about the potential for direct democracy. Social

ecologists have worked to bring the praxis of direct democracy into social movements since the 1970s, and Bookchin's work offers a vital historical and theoretical context for this continuing conversation.

Sixth, social ecology offers a coherent and articulate political alternative to economic reductionism, identity politics, and many other trends that often dominate today's progressive Left. Bookchin polemicized relentlessly against these and other disturbing tendencies, insisting that our era's ecological crises compel a focus on the general interest, with humanity itself as the only viable revolutionary subject. Social ecology has helped connect contemporary revolutionaries with the legacies of the past and offered a theoretical context for sustaining a coherent, emancipatory revolutionary social vision.

Finally, Bookchin insisted for four decades on the inseparability of oppositional political activity from a reconstructive vision of an ecological future. He viewed most popular leftist writing of our era as only half complete, focusing on critique and analysis to the exclusion of a coherent way forward. At the same time, social ecologists have often spoken out against the increasing accommodation of so-called **alternative institutions** including numerous once-radical co-ops and collectives to a stifling capitalist status quo. Opposition without a reconstructive vision leads to exhaustion and burnout. Alternative institutions without a link to vital, counter systemic social movements are cajoled and coerced by market forces into the ranks of non-threatening green businesses, merely serving an elite clientele with socially responsible products. The corrosive simplification of living ecosystems and the retreat into an increasingly unstable and synthetic world that Murray Bookchin

predicted in the 1960s has evolved from a disturbing future projection to a global reality. Our survival now depends on our ability to challenge this system at its core and evolve a broad, counter hegemonic social movement that refuses to compromise on partial measures. Hopefully such a movement will embrace and continue to expand and elaborate the revolutionary and reconstructive social and political vision of social ecology.

3.6. THE FINAL ECOLOGICAL SOCIETY AS PROPOUNDED BY BOOKCHIN

Bookchin authored more than twenty books and countless articles and pamphlets, seeking to offer a coherent theoretical underpinning to the work of a generation of ecological and anti-authoritarian activists. Bookchin also revived and updated the tradition of social anarchism, which had fallen rather dormant by the early 1960s, but later renounced his tie to anarchism and sought to articulate a new libertarian socialist synthesis, which he termed **communalism**. Nonetheless, his sweeping condemnations of Marxism from the late sixties through the eighties drew the antipathy of many traditional leftists.

The explosive implications of an ecological approach arise not only because ecology is intrinsically a critical science critical on a scale that the most radical systems of political economy have failed to attain but also because it is an integrative and reconstructive science. This integrative, reconstructive aspect of ecology, carried through to all its implications, leads directly into anarchic areas of social thought (Bookchin, 1962, p.3). For, in the final analysis, it is impossible to achieve a

harmonization of man and nature without creating a human community that lives in a lasting balance with its natural environment.

Social ecology is an appeal not only for moral regeneration but also, and above all, for social reconstruction along ecological lines. It emphasizes that an ethical appeal to the powers that be (that embody blind market forces and competitive relationships), taken by itself, is likely to be futile. Indeed, taken by itself, it often obscures the real power relationships that prevail today by making the attainment of an ecological society seem merely a matter of attitude, of spiritual change, or of quasi-religious redemption. Although always mindful of the need for spiritual change, social ecology seeks to redress the ecological abuses that society has inflicted on the natural world by going to the structural as well as the subjective sources of notions like the domination of nature' (Bookchin, 1962, p.71). That is, it challenges the entire system of domination itself and seeks to eliminate the hierarchical and class edifice that has imposed itself on humanity and defined the relationship between nonhuman and human nature. It advances an ethics of complementarity in which human beings must play a supportive role in perpetuating the integrity of the biosphere, as potentially, at least, the most conscious products of natural evolution. Indeed humans are seen to have a moral responsibility to function creatively in the unfolding of that evolution. Social ecology thus stresses the need for embodying its ethics of complementarity in palpable social institutions that will give active meaning to its goal of wholeness, and of human involvement as conscious and moral agents in the interplay of species. It meant the cultivation of an affiliation with the interests of the community, one in which the communal interest

was placed above personal interest, or, more properly, in which the personal interest was congruent with and realized through the common.

In an ecological society composed of a 'Commune of communes' (Bookchin, 1971, p.48) property would belong, ultimately, neither to private producers nor to a nation-state. The Soviet Union gave rise to an overbearing bureaucracy; the anarcho-syndicalist vision to competing worker-controlled factories that ultimately had to be knitted together by a labour bureaucracy. From the standpoint of social ecology, property interests would become generalized, not reconstituted in different conflicting or unmanageable forms. They would be municipalized, rather than nationalized or privatized. Workers, farmers, professionals, and the like would thus deal with municipalized property as citizens, not as members of a vocational or social group. Leaving aside any discussion of such visions as the rotation of work, the citizen who engages in both industrial and agricultural activity, and the professional who also does manual labour, the communal ideas advanced by social ecology would give rise to individuals for whom the collective interest is inseparable from the personal, the public interest from the private, the political interest from the social.

The step-by-step reorganization of municipalities, their confederation into ever-larger networks that form a dual power in opposition to the nation-state, the remaking of the constituents of republican representatives into citizens who participate in a direct democracy-all may take a considerable period of time to achieve. But in the end, they alone can potentially eliminate the domination of human by human and thereby deal with those ecological problems whose growing

magnitude threatens the existence of a biosphere than can support advanced forms of life. To ignore the need for these sweeping but eminently practical changes would be to let our ecological problems fester and spread to a point where there would no longer be any opportunity to resolve them. Any attempt to ignore their impact on the biosphere or deal with them singly would be recipe for disaster, a guarantee that the anti-ecological society that prevails in most of the world today would blindly hurtle the biosphere as we know it to certain destruction.

3.7. RADICAL ECOLOGY AS THE FINAL PRODUCT

There is now one dominant global culture, an ever expansionist and predatory industrial capitalism, valuing profit above life. It is a system which reduces the entire natural world- mountains, forests, oceans; plants and animal species (including human beings) -into resources to be ordered and controlled, used and exploited in the pursuit of material growth and economic development- this ever more suffocating technocratic system, is destroying the ecology of life.

Radical ecology points out that solution to a crisis of this scale involve far more than technological fixes or market incentives: How can there be technological solutions while the drive to mastery at the core of technological development remains unchallenged? How can there be market based or consumer driven solutions unless we realise that an economic system that regards the natural world as so many resources to be bought, sold, and commodified is deeply irreconcilable with a truly ecological sensibility? How can we hope that legislation and regulation will be adequate while our political systems continue to support the disempowerment of the majority of humankind, and drift inexorably towards lifeboat authoritarianism?

Embracing both deep ecology and social ecology, radical ecology seeks to champion a sustainable and socially just world through the transformation of the conditioning factors which exist both within our individual consciousness and which are inscribed in our social-economic, political-judicial and technological systems, in a way that highly determines our lives.

The term Deep Ecology was first coined in 1972 by Norwegian philosopher Arne Naess. He used the term to point out a distinction between a shallow anthropocentric and technocratic environmental movement concerned primarily with pollution, resource depletion, and the health and affluence of people in the developed countries, and a **Deep, Long-Range Ecology movement** (Guha and Gadgil,1989, p.22).

In this view, shallow environmentalism is human-centred. It views humans as somehow above our outside of nature, the pinnacle of evolution, as the source of all value, and ascribes only instrumental or use value to nature which humans are variously entitled to dominate, control or (in slightly softer terms) steward. In this way it perpetuates many of the fundamental world views which have fuelled our collision course with ecological disaster.

In contrast deep ecology offers a fundamentally different sensibility. It does not separate humans from the natural environment. Neither does it see the world as a collection of isolated objects (as much of western Cartesian and mechanistic science has assumed) but as a network of phenomena that are fundamentally interconnected and interdependent (as the new systems theory growing out of the life sciences

suggests). Deep ecology recognizes the intrinsic value of all living beings and views humans as just one particular strand in the web of life. Ultimately, deep ecological awareness implies a spiritual or religious awareness. It encourages a shift in consciousness from an alienating sense of separateness to one of belonging, of connectedness, to the natural ecosystems on which we depend and even to cosmos as a whole. The new vision of reality which emerges with a deep ecological awareness is largely consistent with the so-called perennial philosophy of spiritual traditions. It has found affiliation amongst the spirituality inspired by Christian mystics, Buddhists, the pagan and Wicca inspired practices of the Reclaiming tradition, and is found to be consonant with the philosophy and cosmology underlying the worldviews of many indigenous peoples.

Deep ecology asks ever deeper questions about the very foundations of our modern, scientific, industrial, growth-oriented, materialistic worldview and way of life. It challenges this paradigm from an ecological perspective: from the perspective of our profound interconnectedness with one another, with future generations, and to the web of life. Although deep ecology has provided a valuable philosophical and spiritual basis for the emergence of an ecological consciousness, and a revealing critique of the anthropocentric paradigms of our current civilisation, it has sometimes failed to offer much by way of political critique. At times proponents of deep ecology have tended to indiscriminately lump humanity together into an undifferentiated anti-ecological entity (Taylor,1986,p.13), sometimes even falling into misanthropy. Deep ecologists have often failed to recognise how, what Raine Eisler has called, the 'dominator system' (Bookchin, 1990, p.48) of social organisation has been at core of the ecologically destructive socio-economic systems

of our time. The apparent lack of a political critique and understanding of the role of socio-economic systems in ecological destruction led to a variety of criticisms from social ecologists. Many of those criticisms have been welcomed and have contributed to a deeper understanding of the systems at play amongst deep ecologists.

Social ecology augments deep ecology with its analysis of the way in which patterns of social organisation such as patriarchy, capitalism and imperialism are central to the current ecological crisis. Social ecologists and ecofeminists have pointed out how the exploitation of nature has gone hand in hand with the exploitation of other humans in various hierarchical, militaristic, capitalist and industrialist forms (Schweitzer, 1987, p.347). They point out that social transformation does not simply lead from a change of consciousness, but also requires radical restructuring of the socio-economic system. The work of many social ecologists like Murray Bookchin, Francis Moore Lappe, J. Baird Callicott, along with contributions from George Bradford, Ariel Kay Salleh, Janet Biehl, and Carolyn Merchant have offered a valuable critique and corrective to deep ecology's limitations in this respect.

Deep ecologists have in turn made counter arguments. And an ongoing debate continues between deep and social ecologists which has created a fertile and valuable range of analysis from which many radical ecologists draw insights and inspiration. Marrying a political critique with recognition of the psychological and spiritual dimensions of our condition, radical ecology has grown into a diverse and creative movement.

Radical ecology is not a monolithic movement, nor does it suggest a fixed ideological position. Radical ecology is a critical encounter, a working out through thought and praxis, of how we can really envision, embody and realise both methods to resist the destructive march of the industrial growth socio-economic system and effect the changes necessary for a new way of living in full partnership with the rest of the natural world. It includes work and experiments in non-hierarchical social forms, new economics, process oriented science, and a revitalised spirituality. Its visionary nature inspires many people forming the anti-globalisation movement and practitioners of direct action, as well as many working in mainstream political fields, ecological conservation, the organic agriculture and permaculture movements and many fighting for the rights of indigenous people.

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CHAPTER IV

CONCEPTS OF ARCHITECTURAL ECOLOGY BY EBENEZER HOWARD AND WILLIAM MORRIS

4.1. ARTS AND CRAFT THEORY

4.1.1. THE ARTS AND CRAFTS MOVEMENT

The Arts and Crafts Movement began in Britain around 1880 and quickly spread to America, Europe and Japan. Inspired by the ideas of John Ruskin and William Morris, it advocated a revival of traditional handicrafts, a return to a simpler way of life and an improvement in the design of ordinary domestic objects. Across Europe, the Arts and Crafts Movement saw a revival of traditional techniques and materials and the creation of new forms that were both ageless and innovative.

The Arts and Crafts Movement (1850-1900) was a reaction against the Industrial Revolution. The development of the steam engine by James Watt in 1765 led to the mechanization of industry, agriculture and transportation and changed the life of the working man in Britain. The cities and towns grew to accommodate the expanding industries and the influx of workers from the countryside looking for employment. However, living standards gradually deteriorated and industrialization left people with a sense that their life had changed for the worst. Many had sacrificed a rural lifestyle in England's green and pleasant land for the sake of a job in the dark Satanic mills of the Industrial Revolution. As a result, they lost that feeling of security and belonging which comes from living in smaller communities.

The members of the Arts and Crafts Movement included artists, architects, designers, craftsmen and writers. They feared that industrialization was destroying the environment in which traditional skills and crafts could prosper, as machine production had taken the pride, skill and design out of the quality of goods being manufactured. They believed that hand crafted objects were superior to those made by machine and that the rural craftsman had a superior lifestyle to those who slaved in the urban mills and factories. They were convinced that the general decline of artistic standards brought on by industrialization was linked to the nation's social and moral decline.

The Arts and Crafts Movement formed into various crafts guilds to try to recreate the dignified working environment that existed in the medieval crafts guilds. They gave themselves names such as the Century Guild, the Guild of Saint George, the Art Workers Guild and the Guild of Handicraft. The Century Guild was the first of the craft guilds to form. It was founded in 1882, under the influence of William Morris, by the architect and designer A.H. Mackmurdo. In 1884 the guild published a quarterly journal called *Hobby Horse* to promote their aims and ideals. In particular, they championed the craft of printing as an art form which inspired Morris to found the Kelmscott Press.

Arts and Crafts architecture was, like the movement itself, defined more by a set of ideals and principles than a particular architectural style. Many of its leading figures were architects, rather than designers, and they came to view buildings and their interiors as a whole. They worked in a variety of media, often with other artists, and hoped to bring a greater unity to the arts. As a result, Arts and Crafts buildings often

included sculpture and carved or tiled decoration, sometimes with highly symbolic imagery. Another defining feature of Arts and Crafts architecture was an interest in the vernacular. Architects used local materials and traditional styles to create something that would not jar with its surroundings, but at the same time distinctive and modern. Many hoped to revive traditional building and craft skills, or to design buildings that looked as if they had grown over many years. The Arts and Crafts movement emerged during the late Victorian period in England, the most industrialized country in the world at that time. Anxieties about industrial life fueled a positive revaluation of handcraftsmanship and pre-capitalist forms of culture and society. Arts and Crafts designers sought to improve standards of decorative design, believed to have been debased by mechanization, and to create environments in which beautiful and fine workmanship governed. The Arts and Crafts movement did not promote a particular style, but it did advocate reform as part of its philosophy and instigated a critique of industrial labor; as modern machines replaced workers, Arts and Crafts proponents called for an end to the division of labor and advanced the designer as craftsman. Morris encouraged artists to look to the past for their inspiration believing that the art of his own age was inferior. Morris' solution was for a return to the values of the Gothic art of the middle Ages, where artists and craftsmen had worked together with a common purpose: to glorify God through the practice of their skills. The model for this solution was the medieval crafts guilds which he saw as a type of socialist brotherhood where everybody fulfilled themselves according to their level of ability. Morris felt that this would enhance the quality of life for all, and that artistic activity itself would be seen as a force for good in society.

The greatest legacy of the Arts and Crafts movement was their understanding of the relationship between design and our quality of life. This set the example for others who would later attempt to use the power of industrial mass production in the service of good design.

4.1.2. WILLIAM MORRIS' '*NEWS FROM NOWHERE'* AND ECOLOGY

Morris strove to unite all the arts within the decoration of the home, emphasizing nature and simplicity of form. The origins of what we now call William Morris's *Arts and Crafts* philosophy of production can be traced to the **expressive theory** of labour that he inherited from John Ruskin: the idea of labour as a form of artistic expression vital to human dignity, which leaves a trace of individual workmanship in all created goods (Ruskin, 1849, p.38). Through Ruskin's conceptual marriage of art and work, Morris voiced an early disgust for industrial capitalism and its eradication of creativity in labour, and an early, related rejection of the artistic and literary conventions that had flourished under capitalism. These convictions persisted from the initial years of Morris's career in the 1850s and 1860s- which focused on the launch of the firm Morris, Marshall, Faulkner & Co., the revival of handcraft methods, and the writing of Pre-Raphaelite poetry- to the latter part of his career, which focused on the socialist campaign and the writing of political novels and communist poetry. If Ruskin was the leading light in Morris's thinking from his student days at Oxford, Karl Marx was perhaps an equal influence after Morris's conversion to socialism in the early 1880s, and yet his politics and aesthetics remained closely knit together throughout his career: 'seamless', as Peter Stansky has put it (Koolhas, 2000, p.7), within his evolving beliefs. The Arts and Crafts ideal as expressed by Morris, however, offered a critique of capitalist consumption as well

as capitalist production, which has received less consideration, but is especially apparent in Morris's attention to the problem of waste.

In *News from Nowhere*, William Morris imagines a utopian future in which money, 'wage slavery' and 'marriage' have been abolished (Morris,1890, p.74). William Morris's News from Nowhere (1890) takes its hero, William Guest, on a journey into the future. After returning home from an acrimonious socialist meeting, Guest goes to bed in an unsettled state, his mood worsened by the vapour-bath of his commute on the underground railway. On waking, he notices that the industrial din of the Hammersmith riverside has subsided. A walk outside convinces him that he has been transplanted into a beautified city of the future. Guest gradually learns that money has been abolished, that craftwork has pushed aside wage slavery, which contracts of marriage have been replaced by flexible bonds of affection, and that Parliamentary democracy has given way to informal patterns of co-operation. Later in the narrative, Guest is enrolled on a secondary journey. This time, he travels up-river, between Hammersmith and a place that strongly resembles Kelmscott Manor, the summer residence that Morris owned in the Cotswolds. By now, he is feeling ecstatically happy. But just as the prospect of lasting contentment dawns, he loses his footing in the future, and he finds himself back in the 19th century. Devastated at first, Guest gradually accepts that turning his personal dream into a collective vision will require work and organization, and that these efforts have to take place in the old world. Morris's utopia resists the compensation of a quick solution, in other words. Happiness is glimpsed, but there are definite strings attached.

As a kind of culmination of Morris's vision of a social and ecological harmony, the future painted in *News from Nowhere* is almost universally bright. Nevertheless, the work was clearly inspired by an earlier, darker vision of future ecologies and their effects on human society. Part I of the novel, *The Relapse into Barbarism*, depicts in meticulous detail the transformation and evolution of the English landscape following a largely unexplained change. The absence of human impact allows plants and animals to develop unchecked, the wheat welds to be eaten by birds 'feasting at their pleasure' and 'trodden upon by herds of animals'(Morris,1890,p.21), and the great watercourses of England changed or destroyed by plant growth and the destruction of dams by water rats. The houses were built of red brick in some areas and more of timber and plaster, which were by the necessity of their construction, which explains that the people in Nowhere preferred only on the requirement and the eco-balance, which is their first priority (Morris, 1890, p.42). After nature takes its revenge, humans are brought to a feudal state of existence, divided by petty conflicts and mired in ignorance and superstition, as depicted through the romantic quest narrative of Sir Felix, which makes up the novel's second part, *Wild England*. The discovery of hope in a portrayal of ecological catastrophe helped to make more vivid for Morris the limits of anthropocentrism, and offered greater possibilities for advancing a mode of environmental criticism which would regard humans as only one strand of a diverse web of organic life. Morris presented his idea of a future in which humanity had relinquished its dominance, forming a society united by a common wish to keep life simple, to forgo some of the power over nature won by past ages in order to be more human and less mechanical, and willing to sacrifice something to this end.

The novel explores a number of aspects of the society, including its organization and the relationships which it engenders between people. Morris fuses Marxism and the romance tradition when he presents himself as an enchanted figure in a time and place different from Victorian England. Morris tackles one of the most common criticisms of socialism; the supposed lack of incentive to work in a communistic society. Morris' response is that all work should be creative and pleasurable. This differs from the majority of Socialist thinkers, who tend to assume that while work is a necessary evil, a well-planned equal society can reduce the amount of work needed to be done by each worker. *News from Nowhere* was written as a Libertarian socialist response to an earlier book called *Looking Backward*, a book that epitomizes a kind of state socialism that Morris abhorred. It was also meant to directly influence various currents of thought at the time regarding the tactics to bring about socialism. Morris's basic antipathy with Bellamy arose chiefly from his disagreement with Bellamy's social values and aesthetic convictions. While Bellamy favoured the urban, Morris favoured the pastoral; while Bellamy lauded the Industrial Revolution and the power of the machine, Morris yearned for the restoration of an organic way of life which utilized machines only to alleviate the burdens which humans might find irksome; while Bellamy sought salvation through an omnipotent state, Morris wished for a time when it would have withered away. The major elements explained in the book are as follows:

1. Gender:

In *News From Nowhere* Morris describes women in the society as respected as a child bearer and rearer of children desired as a woman, loved as a companion, un-anxious for the future of her children and hence possessed of an enhanced instinct

for maternity. The sexual division of labour remains intact. Women are not exclusively confined to domestic labour, although the range of work they undertake is narrower than that of man; but domestic labour is seen as something for which women are particularly fitted. Moreover, the men there had no longer any opportunity of tyrannising over the women, or the women over the men; both of those took place in old times. The women do what they can do best and what they like best and the men are neither jealous nor injured by it. The practice of women waiting on men at meals is justified on the grounds that, 'It is a great pleasure to a clever woman to manage a house skilfully, and to do so that all house-mates about her look pleased and are grateful to her' (Morris, 1890, p.67). . Morris presents us with a society in which women are free from the oppression of men; yet domestic work, though it is respected, remains gender-specific. Equality is another central utopian idea and Morris' description of an egalitarian society encompasses this value at the social and economic level. Socially, equality is obvious in gender relations and in the absence of class divides.

2. Marriage:

Morris offers a Marxian view of marriage and divorce. In Nowhere people live in groups of various sizes, as they please, and the nuclear family is not necessary. Concerning marriage, the people of Nowhere practice monogamy but are free to pursue romantic love because they are not bound by a contractual marriage.

3. Education:

Though the people of Nowhere are learned there is no formal schooling for children. As for educating children, children in Nowhere often make up parties, and come to

play in the woods for weeks together in the summer time, living in tents, as you see. We rather encourage them to do it; they learn to do things for themselves, and get to know the wild creatures; and you see the less they stew inside houses the better for them. Here Morris breaks away from the traditional institutions of 19th century England. Learning through nature is the best suited lifestyle for this agrarian society.

4. Society:

News from Nowhere is a utopian representation of Morris' vision of an ideal society. This Utopia, an imagined society a literal Nowhere is idyllic because the people in it are free from the burdens of industrialization and therefore they find harmony in a lifestyle that coexists with the natural world. The absence of class divides is linked to economic equality and the abolition of private property. Private property laws satisfied only a privileged few and had the effect of perpetuating crimes of violence. Thus, with the abolition of private property, a criminal law is no longer necessary. The craftspeople from Arts and Crafts Movement worked in various media, including woodwork, pottery, textiles, and metalwork, which ensured that the local labour and tradition flourished in the society. This also made possible the use of local resources for different types of works like production, consumption, decoration, house building etc.

4.1.3. THE SEVEN LAMPS OF ARCHITECTURE AS A PRE-ARTS AND CRAFTS MOVEMENT

John Ruskin, an English art and architecture critic who wrote large volumes of criticism during the Victorian period, published in 1849, his book-length essay *The Seven Lamps of Architecture*. It details the seven lamps, or principles, of

architecture, which are tied to seven moral attributes Ruskin believed to be inseparable from design. These seven principles of architecture are beauty, truth, sacrifice, power, life, obedience, and memory.

In the **beauty** section of the essay, Ruskin relies heavily on the designs seen in nature and points out that architecture should stem from the natural environment. Nature is the model for beauty. Lines and shapes should be derived from the natural world. Ruskin's **lamp of truth** is straightforward and he argued that buildings should be honest. An honest building is defined as a building that doesn't hide its flaws under decorative notions. According to Ruskin, the architect must sacrifice certain design desires in order to please God. Buildings and architecture must be completed so all men can have a holy place to pray to God, and the buildings must adhere to the principles set down by Him. Before ornateness is allowed, rightful and just structures need to be built for the everyday life. This describes the **lamp of sacrifice**. View, setting, and line are discussed in Ruskin's **lamp of power** principle. Ruskin argues that a building possesses shape, and it is the architect's duty to present that shape in the best possible fashion. For example, an open field would be more suitable as a backdrop for a large mansion as opposed to expansive mountain ranges. Ruskin felt that buildings deserved to be viewed from all angles, and certain settings and lines of view disrupt the natural power of a building. Architects must consider all vantage points, building position, and the horizon when considering the design of a building. Moreover, Ruskin goes into depth about the bounding line and avoiding the disruption of continuity. Ruskin insists that great buildings are made by the hands of skilled architects and craftsmen, which is the basis for the **lamp of life.** Masons and carpenters must pour their lives into a building project. Furthermore,

Ruskin takes a strong stance against large-scale building plans, and advocates for a local, unique approach to the design of every building. The lamp of Life is all but forgotten. John Ruskin valued the contribution of the individual artist and craftsmen. There is little in the way of current building activity, whether modern or traditional, that can be said to draw value from the contribution of its craftsmen. This accounts for the initial base for the Arts and Crafts Movement by William Morris. The Lamp of Memory articulates the scrupulous respect for the original fabric of old buildings which inspired William Morris and, through him, the conservation movement of the 20th century. Buildings (and houses) should reflect the culture and what went on before. They in turn will inform the culture that follows. John Ruskin was not a big fan of innovative disruption. Even gradual change is something to be distrusted. In some ways he was the ultimate cultural conservative, which explains the **lamp of memory**. Lastly, the **lamp of obedience** says that no originality for its own sake, but conforming to the finest among existing values of the society.

It was John Ruskin who laid the foundation for the craftsman style values and use of traditional elements in design and construction as well as in all other spheres of livelihood. His writings predicted and commented on social issues such as environmentalism, sustainability, craftsmanship, and fulfilling labor. Most importantly for the Arts and Crafts Movement to come, Ruskin called for a revival of traditional craftsmanship and a return to the spiritual values of handcrafting from natural materials. Two of his most influential works, *The Seven Lamps of Architecture* (1849) and *The Stones of Venice* (1851-53, a trilogy), addressed the subjects of nature, art, society, and skilled craftsmanship, and attacked division of labor (industrialized workforce specialization) and industrial capitalism. Such topics

are truly close to the heart of the Arts and Crafts Movement. His purpose was to combine pre-industrial, medieval values with a practical means of forwarding social progress and betterment against the wave of industrial capitalism. It supported small enterprises concentrating on the preservation of local crafts and craftsmanship. Its operations adhered to principles of sustainability and clean energy such as wind and water power. Ruskin, as founder, provided vision and leadership, and also donated money and land. The guild is still active today. John Ruskin was ahead of his time, as evidenced by the contents of his books, lectures, essays, and correspondence letters. He wrote about issues such as minimum wage, health services, pension, and education of women, pollution, erosion, and even global warming, at a time in history when these were not common issues.

4.1.4. MORRIS' INFLUENCE ON THE 21ST CENTURY ARCHITECTURE AND PLANNING

Its 150 years since William Morris first set up shop. His ideas changed the face of architecture, the decorative arts, and they transformed cities. His vision was for a revival of living and working together in a beautiful community. William Morris' residence **The Red House**, built in 1859-60 in Bexley Heath, is considered to be the first Arts and Crafts house, and it changed the world. The architect was Philip Webb and it was his first commission. Morris wanted beautiful hand crafted products to be for everyone, but the high cost of his materials meant that only the wealthy could afford to be his clients, which inspired him to produce local crafts to be used by everyone while also promoting the local craftsman. In the 1880s William Morris and Philip Webb set up the Society for Protection of Ancient Buildings (SPAB), which launched the conservation movement.

Morris' theory encouraged equity in society through proper distribution and utilization of resources which requires efficient resource management and thus environmental accountability comes into consideration. Environmental accountability places a global responsibility to maintain the environment's equity position (Pramanik, 2008,p.59). The underlying policy here is sustainable development. Environmental accountability is similar to what Morris mentioned as affordability of products as well as resources in his concept of Arts and Crafts. National environmental regulation here thus receives its base from Morris, which places responsibility on business and the market place for reporting consumption of resources and environmental degradation. Environmental accounting have different roles like provides quantitative information about environmental aspects, identifying cost saving opportunities; better decisions with regard to resources and their pricing; avoiding future costs through better resource preservation; and financial justification for environmental management, facilitates to carry out environmental conservative activities, business organizations can accurately identify and measure investments and costs related to environmental conservation activities. Environmental accounting also plays a very important role in supporting rational decision-making regarding environmental aspects. It also facilitates protection of stakeholder interest by way of disclosure of environmental accounting information.

William Morris also inspired Ebenezer Howard and Raymond Unwill in the creation of the world's first Garden City, at Letchworth, Hertforshire, in 1903. This was a privately funded development. Howard's plan for garden cities was a response to the need for improvement in the quality of urban life, which had become marred by

overcrowding and congestion due to uncontrolled growth since the Industrial Revolution. Howard's concept of interrelating country and city in a planned city of predetermined size has enjoyed wide popularity in the planning of subsequent new towns. His emphasis on greenbelt areas and controlled population densities has become an integral part of suburban and city planning as well.

4.2. GARDEN CITY CONCEPT BY EBENEZER HOWARD

The fusion of diverse technological, economic and social conditions at the end of the eighteenth century contributed largely to speeding up industrialization in Western Europe, particularly in Great Britain, which, by the middle of the nineteenth century, became the leading industrial country in the world. In the big cities of the United Kingdom, the Industrial Revolution simultaneously brought about the concentration of both the power and the misery, which was most obvious in the places where the weakest participants in the production chain lived- the labourers' suburbs of a metropolis. Throughout the nineteenth century, these suburbs managed to survive among constantly expanding centres, huge traffic junctions, as well as, within already defined, urban industrial zones. The situation was similar at the beginning of the twentieth century: the lack of space, overpopulation and general dehumanization of the living conditions of the majority of people- those still remained the main problems of the big cities. These phenomena and the complementary opposites that coexisted in the big cities were also noticed by Ebenezer Howard (1850-1928), who tried to eliminate or at least reduce them by creating the theoretical concept of Garden Cities of Tomorrow. Ebenezer Howard's idea of urban decentralisation, zoning for different uses, the integration of nature into cities, green-belting and the development of **self-contained new town** communities outside crowded central

cities laid the groundwork for the entire tradition of modern city planning. Ebenezer Howard's book ***To-morrow: A Peaceful Path to Reform*** (1898) which was republished as ***Garden Cities of Tomorrow***(1902), put forth designs for a 'social city'(Howard,1902,p.16) that attempted to bridge between the individualist (capitalist) system of the time and the ideals of socialism that were gaining political impetus. The book was visualised during a time when countries were beginning to urbanize (15% of the world's population were urban, a rapidly growing figure), there were squalid living and working environments and the working class were unable to afford a decent home. Howard's response was just one of numerous utopian visions that spoke of a better future, with the key difference being that he aimed to produce a scheme that was both realistic and achievable.

It is important to understand the context to which Howard's work was a reaction. London (and other cities) in the 19th century were in the throw of industrialization, and the cities were exerting massive forces on the labour markets of the time. Massive immigration from the countryside to the cities was taking place with London compared to 'a tumor, an elephantiasis sucking into a gorged system half the life and blood and the bone of the rural districts'(Howard, 1902, p.15) .This situation was unsustainable and political commentators of all parties sought how best to provide the proper antidote against the greatest danger of modern existence and the realization that the health of the English fighting man had greatly deteriorated and cannot be forgotten either. To Howard the cure was to reintegrate people with the countryside. In trying to understand and represent the attraction of the city he compared each city to a magnet, with individuals represented as needles drawn to the city. He set about comparing the **town and country magnets** but decided that

neither were suitable attractors for his utopian vision. Instead he believed that human society and the beauty of nature are meant to be enjoyed together and his solution the two magnets must be made one (Howard, 1902,p.21).

Howard's plan for garden cities was a response to the need for improvement in the quality of urban life, which had become marred by overcrowding and congestion due to uncontrolled growth since the Industrial Revolution. Howard's solution to the related problems of rural depopulation and the runaway growth of great towns and cities was the creation of a series of small, planned cities that would combine the amenities of urban life with the ready access to nature typical of rural environments. The garden city was defined as 'town designed for healthy living and industry, of a size that makes possible the full measure of social life but no larger, surrounded by a rural belt, all of the land being in public ownership or held in trust for the community' (Howard, 1902,p.45).

The main features of Howard's scheme were:

i. the purchase of a large area of agricultural land within a ring fence;
ii. the planning of a compact town surrounded by a wide rural belt;
iii. the accommodation of residents, industry, and agriculture within the town;
iv. the limitation of the extent of the town and prevention of encroachment upon the rural belt;
v. the natural rise in land values to be used for the town's own general welfare

A Garden City is a city of which the freehold belongs to the community; the rents paid for the land being a fund out of which rates are chiefly paid. It is planned with a

view to its being a healthy, beautiful and pleasant place in which to work, to play, and rest and to bring up families, with a belt of open fields around it, so as to secure for all time the combined advantages of town and country life. The houses in such a city must have good gardens, be not built too closely together, nor must there be overcrowding in the houses themselves. Its population will be friendly and tolerant, expressing their hatred of all forms of injustice, but this chiefly by their love of every form of right-doing.

Howard's ideal garden city would be located on a 6,000-acre tract of land currently used for agriculture purposes only (Howard, 1902, p.19). It would be privately owned by a small group of individuals; this company, in retaining ownership, would retain control of land use. Revenue, to pay off the mortgage and to fund city services, would be raised solely by rents. Private industry would be encouraged to rent and to use space in the town. Only a fraction of the tract's land would be built upon by the town's 30,000 inhabitants; the rest would be used for agricultural and recreational purposes. At the centre of the city would lay a garden ringed with the civic and cultural complex including the city hall, a concert hall, museum, theatre, library, and hospital. Six broad main avenues would radiate from this centre. Concentric to this urban core would be a park, a combination shopping centre and conservatory, a residential area, and then, at the outer edge, industry. Traffic would move along avenues extending along the radii and concentric boulevards.

Howard stressed that the actual placement and planning of such a town would be governed by its site. In 1903 he had the pleasure of seeing his plan realized. A garden city called Letchworth was developed about 30 miles north of London in

Hertfordshire, Eng. It succeeded according to the guidelines that he had laid down, and in 1920 a second, Welwyn Garden City, was established nearby. Howard's concept of interrelating country and city in a planned city of predetermined size has enjoyed wide popularity in the planning of subsequent new towns. His emphasis on greenbelt areas and controlled population densities has become an integral part of suburban and city planning as well. Howard's Garden city ideas stimulated many architects and planners all over the world. After the death of Howard in 1928, the Garden City Association, which was renamed Town and Country Planning Association, continued to influence British tow planning and regional planning.

4.2.1. INDUSTRIALIZATION AND THE NEED FOR REVITALIZATION

In both Europe and the United States, the surge of industry during the mid- and late 19th century was accompanied by rapid population growth, unfettered business enterprise, great speculative profits, and public failures in managing the unwanted physical consequences of development. Giant sprawling cities developed during this era, exhibiting the luxuries of wealth and the meanness of poverty in sharp juxtaposition. Eventually the corruption and exploitation of the era gave rise to the Progressive movement, of which city planning formed a part. The slums, congestion, disorder, ugliness, and threat of disease provoked a reaction in which sanitation improvement was the first demand. Significant betterment of public health resulted from engineering improvements in water supply and sewerage, which were essential to the further growth of urban populations. Later in the century the first housing reform measures were enacted. The early regulatory laws (such as Great Britain's Public Health Act of 1848 and the New York State Tenement House Act of 1879) set minimal standards for housing construction. Implementation, however, occurred

only slowly, as governments did not provide funding for upgrading existing dwellings, nor did the minimal rent-paying ability of slum dwellers offer incentives for landlords to improve their buildings. Nevertheless, housing improvement occurred as new structures were erected, and new legislation continued to raise standards, often in response to the exposes of investigators and activists such as Jacob Riis in the United States and Charles Booth in England. Also during the Progressive era, which extended through the early 20th century, efforts to improve the urban environment emerged from recognition of the need for recreation. Parks were developed to provide visual relief and places for healthful play or relaxation. Later, playgrounds were carved out in congested areas, and facilities for games and sports were established not only for children but also for adults, whose workdays gradually shortened. Supporters of the parks movement believed that the opportunity for outdoor recreation would have a civilizing effect on the working classes, who were otherwise consigned to overcrowded housing and unhealthful workplaces. New York's Central Park, envisioned in the 1850s and designed by architects Calvert Vaux and Frederick Law Olmsted, became a widely imitated model. Among its contributions were the separation of pedestrian and vehicular traffic, the creation of a romantic landscape within the heart of the city, and a demonstration that the creation of parks could greatly enhance real-estate values in their surroundings.

4.2.2. THE TOWN-COUNTRY MAGNET

Garden Cities of To-morrow begin by describing the **Three Magnets:** Town, Country, and Town-Country. Howard explains why we are attracted to the best of both Town and Country aspects. Town-Country benefits have cooperation, beauty, nature, green fields, green parks, good utilities, good commerce, social opportunity,

high wages, low rents, low price rates, and low pollution. Howard describes inter-connected urban nodes. Central City is shown in the figure below with a constellation of satellite micro-cities (garden cities, towns, villages, developments). Garden Cities at their heart have a central garden, with rings of dwellings, shops, roads, industry, fields, and farms. The ordered layout is meant to improve biological, social, economic, and personal life for everyone. Howard believed that Socialism and Individualism must come together in the future to realize a true, vital organic society and state. Building on the principles of the Three Magnets, Howard begins to establish a hypothetical scenario for the testing of his proposals for social reform.

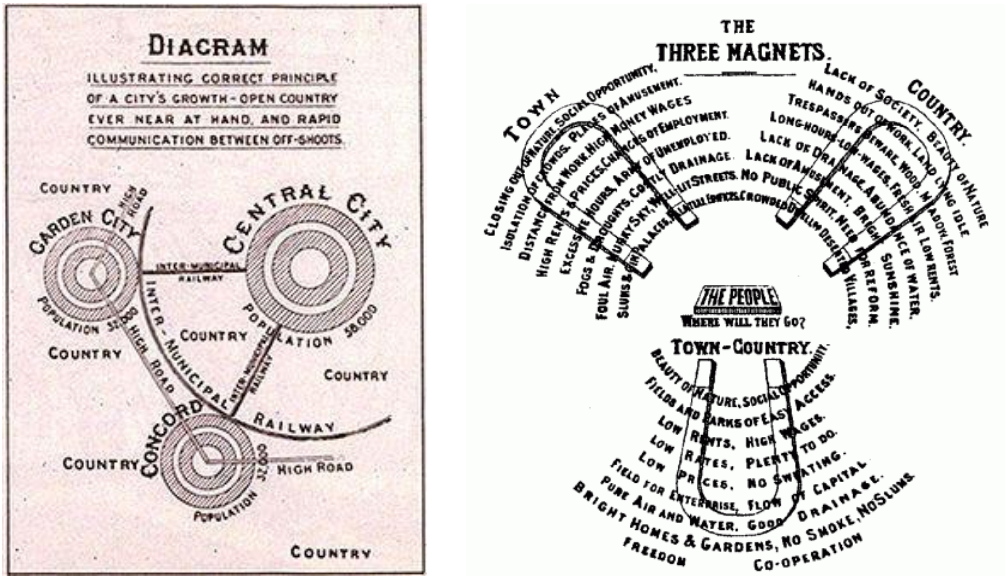

Figure 1: The Three Magnets by Ebenezer Howard (Howard, 1902,p.19)

The three magnetic ideas tried to fuse the individualist system of the time together with socialism ideals because the ideas were gaining political drive as well as attention from trade unions and co-operatives. In addition, they were also gaining communal land protection.

Despite being incredibly descriptive in his proposal Howard repeats on a number of occasions that the design and ideas on planning he puts forth should not be taken verbatim, instead any design should be entirely dependent on the context. The principles, which Howard wanted to emphasize, were not morphological- with the exception of an agricultural belt to limit city growth and concentrate social life within the city- but sociological. The principles of the garden city are as follows:

1. **Revenue and Expenditure:**

Central to Howard's argument was that the Garden City could operate economically and allow the community to have ownership of the land. He goes to great lengths to demonstrate how the revenue derived simply from rents could be used to pay the interest with which the estate was purchased (providing a 4% return for the initial investors, provide a sinking fund for the purpose of paying off the principal, construct and maintain all the works typically undertaken by municipalities (including a detailed breakdown of associated costs) and provide a large surplus for other purposes including old age pensions, medical services and insurance.

2. **Administration**

In dealing with the administration of the Garden City the first question to be dealt with is the extent to which municipal enterprise is carried out and to what extent it should supersede private enterprise. Howard does not advocate the complete municipalisation of industry or the elimination of private enterprise, instead he proposes a cautious and limited municipality that does not attempt 'too much'(Howard,1902, p.25). The activities are to be closely related to the rate-rent of the tenants and would 'grow in proportion as municipal work is done efficiently and

honestly'(Howard,1902,p.27) . With this in mind the structure of the municipality and its administration is proposed with a Board of Management composed of The Central Council and The Departments (Public Control, Engineering, Social and Education).

3. A Welfare Municipality:

The Garden City proposal could be read as being in a state of tension between individual and social ideals. This is particularly evident in the explanation of how to create local choice, in terms of goods and services available to citizens, is made by heavily regulated private enterprise. Instead of 'an absurd multiplication of shops' (Howard, 1902, p.32) providing the same service- a single shop is allowed with the threat of competition (if the community feels the shop keeper is keeping prices to high, paying insufficient wages to his employees, etc) designed to keep prices low and service high. These local tradesmen are in essence municipal servants in all but title; not being bound in what Howard calls the 'red tape of officialism'(Howard,1902, p.34). Howard hopes that, as opposed to other socialist (including communist) reform experiments of the day, that his proposal would appeal to not only individuals but to co-operators, manufacturers, philanthropic societies, and others experienced in organization.

4. City Growth:

Assuming the Garden City model was implemented and found to be successful Howard begins to describe how the City could grow and become part of an integrated network of Garden Cities. The principle of 'always preserving a belt of country'(Howard,1902, p.61) around cities should always be maintained, argues

Howard, so once a city has reached capacity a new one must be founded outside the agricultural belt (the influence of colonial-models prominent). The off-shoot city would grow organically, a ward at a time. Eventually there a central city (of perhaps 58,000 inhabitants) would be surrounded by a number of smaller off-shoot cities, connected by railroad and canal infrastructure.

4.2.3. LEGACY OF THE GARDEN CITY PRINCIPLE

When *Tomorrow* was first published the world was very different to the media-rich urban environment we currently inhabit. Despite this Ebenezer Howard is still regarded as one of the most important figures in the international development of urban planning. His simple diagrams of the model city have been taken up and reinterpreted a hundred times over across the globe but Howard's most cherished ideas of social reform had very little impact- his social reformist message was lost. He set in motion new ideas about hierarchy of services within the city, the essential components of community, being planned with clear zoning principles. Whilst the ideas about hierarchy and zoning were not original in themselves, it was the holistic approach that Howard adopted that helped lend them legitimacy. The idea of the agricultural belt, the 'bounded' city, is directly responsible for policies of **Green Belt** in the UK (and other parts of the world) that has since evolved and changed but essentially remains about constricting and controlling urban growth. Additionally, the debate about the future of American Cities in the 1950s, with the infamous arguments between Jacobs and Mumford, can be traced back to the Garden City Movement. It will forever be associated with the ideas of suburbia and, increasingly, new urbanism. If there was one enduring legacy though, beyond the physical make-up of the city, it is the importance Howard gave to creating a sense of community

and harboring relationships between human beings, enhancing them through good planning and design that promoted sociability.

4.2.4. THE CITY BEAUTIFUL MOVEMENT AS A DERIVATION FROM THE GARDEN CITY PRINCIPLE

Concern for the appearance of the city had long been manifest in Europe, in the imperial tradition of court and palace and in the central plazas and great buildings of church and state. In Paris during the Second Empire (1852–70), Georges-Eugene, Baron Haussmann, became the greatest of the planners on a grand scale, advocating straight arterial boulevards, advantageous vistas, and a symmetry of squares and radiating roads. The resulting urban form was widely emulated throughout the rest of continental Europe. Haussmann's efforts went well beyond beautification, however; essentially they broke down the barriers to commerce presented by medieval Paris, modernizing the city so as to enable the efficient transportation of goods as well as the rapid mobilization of military troops. His designs involved the demolition of antiquated tenement structures and their replacement by new apartment houses intended for a wealthier clientele, the construction of transportation corridors and commercial space that broke up residential neighborhoods, and the displacement of poor people from centrally located areas. Haussmann's methods provided a template by which urban redevelopment programs would operate in Europe and the United States until nearly the end of the 20th century, and they would extend their influence in much of the developing world after that.

As the grandeur of the European vision took root in the United States through the City Beautiful movement, its showpiece became the World's Columbian Exposition of 1893, developed in Chicago according to principles set out by American architect Daniel Burnham. The architectural style of the exposition established an ideal that many cities imitated. Thus, the archetype of the City Beautiful- characterized by grand malls and majestically sited civic buildings in Greco-Roman architecture- was replicated in civic centers and boulevards throughout the country, contrasting with and in protest against the surrounding disorder and ugliness. However, diffusion of the model in the United States was limited by the much more restricted power of the state (in contrast to European counterparts) and by the City Beautiful model's weak potential for enhancing businesses' profitability.

Whereas Haussmann's approach was especially influential on the European continent and in the design of American civic centers, it was the utopian concept of the garden city, first described by British social reformer Ebenezer Howard in his book, which shaped the appearance of residential areas in the United States and Great Britain. Essentially a suburban form, Howard's garden city incorporated low-rise homes on winding streets and cul-de-sac, the separation of commerce from residences, and plentiful open space lush with greenery. Howard called for a 'cooperative commonwealth' (Howard,1902,p.19) in which rises in property values would be shared by the community, open land would be communally held, and manufacturing and retail establishments would be clustered within a short distance of residences. Successors abandoned Howard's socialist ideals but held on to the residential design form established in the two new towns built during Howard's lifetime (Letchworth and Welwyn Garden City), ultimately imitating the garden city

model of winding roads and ample greenery in the forming of the modern suburban subdivision.

4.2.5. INFLUENCE OF THE GARDEN CITY CONCEPT:

The values that underpinned Ebenezer Howard's Garden City model are still as relevant to our community as they were over 100 years ago. Access to light and fresh air, to land for growing plants, keeping animals and for recreation are still significant. Similarly, it is still important in our contemporary society, that individuals can enjoy a level of prosperity, have access to healthy, safe housing, to services and employment and have a variety of opportunities for socializing and participating in the community. Because these values are fundamental to an egalitarian society, they have remained at the core of planning policy and strategies and have continued to influence the structure and layout of the urban environment. What have changed over time are people's aspirations and the exponential development of new technologies. The result is that as our lifestyles, tastes and use of new building designs and materials have changed so has the visual character of the suburbs.

Contemporary planning policies and strategies now have to deal with challenges resulting from an ageing but active population, a highly mobile workforce that also demands flexibility in the working regimes, greater personal liquidity and of course the environmental costs that accrue with climate change- high energy costs, prolonged drought, bushfires and floods. The Garden City values and the emphasis they place on social and environmental well being will still underpin how any new development recognizes the essential layout and quality of urban and suburban

areas. The Garden City values can be encapsulated in objectives and expressed in design principles to guide redevelopment. As it is the layout and spatial structure of the urban and suburb that is critical to achieving social and environmental amenity, the garden city objectives and principles identify the spatial relationships between street, block and dwelling. New development can offer contemporary living choices as well as being complementary and sympathetic to the character of the early Garden City suburbs by recognizing and incorporating the original values that sought to promote human well-being in a visually pleasing landscape.

The garden city and greenbelt idea had spread to several European countries. The concept brought latest thoughts about city building and still the idea is going through further refinement and adjustments according to situations in different countries. It stimulated planners, architects, citizens and politicians to think further and more intensely for **eco-societies**.

In 1923 Ernst Gloeden, a German, proposed decentralized regional pattern in his nuclear towns concept with interrelated urban cells. Le Corbusier also preferred his own concept of **'vertical garden cities'** (Corbusier,1927,p.22) with high rise buildings and lots of open spaces around to maximize air, space and greenery. Clarence Perry advocated self-contained neighborhoods of 5000 people with a community centre, schools, shopping, and other institutions in the centre. This concept of neighborhood became an acceptable standard in planning.

Christopher Alexander also proposed one pattern in his book 'Pattern Language' named as 'Country Towns'. He explains:

> ‘Preserve country tows where they exist; and encourage the growth of new self-contained towns, with populations between 500 and 10,000 entirely surrounded by open countryside and at least 10 miles from neighboring towns. Make it the region’s collective concern to give each town the wherewithal it needs to build a base of local industry, so that these towns are not dormitories for people who work in other places, but real towns- able to sustain the whole of life.’ (Alexander,1977,p.34).

4.3. SUSTAINABILITY AND THE TANGIBLE SOCIETY

The theoretical basis for evolution, the most unifying theory in biology, was proposed over a century ago by Charles Darwin. He emphasized the process of natural selection which explains that those species that were most fit or best adapted to their environment would survive environmental stresses. Those better adapted would reproduce and leave more progeny, and thus would render sustainability as the ecosystem is balanced. (Swarup, Mishra and Jauhari,1992, p.32).

Ecosystems depend upon the uninterrupted cycling of biologically as well as environmentally important materials and require the continuous input of energy. The same concept is forwarded by both Morris and Howard through their theories. Morris’ theory concentrated on use of local crafts for building handicrafts as well as settlements while also engaging the local labor such that the people get employment at their own places and thus do not think of migrating to other cities. This also helps in promoting the culture and crafts of the region, which in a way explains sustainability in terms of the environment, society and their culture.

Similarly, Howard's Garden city concept also in based on local availability of resources by local production of goods, food products by local rearing of cattle herds, education and other amenities within the residential range, which renders the people self-sufficient in their definite places. This cut down unnecessary travel cost and thus also cuts down levels of pollution. The great green belt surrounding the settlement also ensures proper spaces for cattle-rearing, playing, cultivation etc. thus bringing back the culture of agrarian communities, as Howard feels that agrarian communities were far better than the present human-centric communities as they do not affect the ecosystem. Thus both Morris and Howard establish sustainability in terms of environment, economic, society and culture which can lead the way forward to self-sustaining communities.

Environmental sustainability – A state in which the demands placed on the environment can be met without reducing its capacity to allow all people to live well, both now and in the future. Issues of importance include: water management and pollution, air pollution, food waste, energy production and consumption, global warming

Social sustainability – The ability of a community to develop processes and structures which not only meet the needs of its current members but also support the ability of future generations to maintain healthy communities. Issues of importance include: community health, safety and security, labor and working conditions, cultural heritage, social equity, human rights

Economic sustainability – The use of various strategies for employing existing resources optimally is such that a responsible and beneficial balance can be achieved over the longer term. Issues of importance include: equitable resource allocation, minimal waste, steady economic growth, long term inclusive economic development plan, sustainable corporate business models.

Traditional architecture develops its individuality by tapping nearby resources and exploiting them to confront problems by a local environment. Each building material displays different physical characteristics. If the environment decides the range of suitable materials, together they dictate form which generally depicts the culture of the society. The ancient Harappan civilization was built on the technology the preparation of sun-dried mud bricks which was prevalent in the region. Harappan towns were characterized by ramparts of burnt bricks, raised for protection against monsoon inundation as well as from hostile armies. Permanent settlements built with this material allowed the inhabitants to utilize the surrounding floodplain's agricultural potential, generating sufficient wealth to finance the civilization's great monuments like the palaces, granaries, water tanks and even the great dock. This depicts the culture of the people as well as provides for sustainable habitat with sufficient open spaces and local production, establishing the theory of Ebenezer Howard. In Harappan domestic architecture, terracotta provided floor tiling, drainage channels and brickwork for toilets, along with sun-dried bricks. This again supports the concept of the Arts and Crafts Movement by William Morris.

Similarly, the people of the northeastern hills of India are undoubtedly the local promoters of bamboo architecture, since it is locally available as well as local labor

in involved. As far back as the 11th century, Chinese Buddhist pilgrims entering India by this hazardous route mention bamboo suspension bridges in their accounts. Several Nagaland and Arunachal tribes, confronted with impassable torrents, solved the problem by building such bridges, which do not harm the environment in any way. The *Adi Gallong* folk of Siang district build houses on slopes, facing a hilltop so that the back of the house projects over the slope (Kolkman and Blackburn,2014,p.58). At the rear, on a raised platform, is the ablution area or the toilet. Waste falls through a hole in the floor down to wild pigs in a sty below who happily recycle it. This formalizes a disposal system flourishing wherever man and pigs co-exist. Again, a Naga house has an elongated plan facing towards the east. Broad wooden subjects generally drawn from wildlife, and hornbills and the horns or a bison were used for decorating the habitats instead of concrete cornices, which proves the eco-sensitivity of the societies.

4.4. MORRIS AND HOWARD: A COMPARISON

The world of modern civilization in its haste to gain a very inequitably divided material prosperity has entirely suppressed popular Art: or in other words that the greater part of the people have no share in Art- which as things now are must be kept in the hands of a few rich or well-to-do people, who we may fairly say need it less and not more than the laborious workers, and thus the ecosystem is exploited. Thus, Morris' Socialism was a new attempt by various utopian thinkers to resolve, or at least to provide a framework which would permit the eventual resolution, of the enormous disparities, disparities which Morris found he could no longer ignore, which he had always perceived as existing between things as they were and as they should be. Though socialism, Morris transformed the ugliness of cities that was, into

the beauty that could be. Morris worked towards a Socialist Revolution (Morris, 1890, p.23) in England, which would, he believed, eventually transform a Victorian Britain which had been physically ravaged and spiritually drained by the Industrial Revolution, into a communal mediaeval agrarian society filled with happy, healthy people who would enjoy their work.

Again, the garden city concept was developed at the turn of the 20th century by stenographer and utopian visionary Ebenezer Howard. At a time when the social ills of the Victorian Era were becoming increasingly stark, Howard envisaged a new magnet of population settlement. Combining the previously separate poles of town and country, the garden city would restore people to the land. Howard's prescribed mix of city and nature extended outward from a central park, which would house civic institutions and shops. The city would be surrounded by a publicly owned green belt to prevent its expansion. Industrial development within its perimeter would make the city self-sufficient. Howard envisioned both an anarchist and socialist state. As part of the late 19th century movement of social reformers, Howard was influenced by socialist thinkers such as Edward Bellamy and William Morris. But Howard did not wholly subscribe to socialism himself. The garden city was designed as a 'social city' (Howard, 1902,p.67), meant to bridge the divide between socialism and individualism. Land was to be collectively purchased by the community, with land rents re-invested into community development. As a self-governing and self-funded entity, the garden city was to be free from central government control. Comprising a mixed-income population of no more than 30,000 people, the garden city idea was underpinned by a spirit of strong community cohesion. Neighborhoods, evoking medieval cooperative living, would be organized

around quadrangles of 30 households, with communal dining rooms, child crèches and laundries. It is therefore no coincidence that Soviet planners enthusiastically took up the garden city idea. And it wasn't just the Soviets. In the US, Howard's concept was influential in the development of neighborhoods as the primary building blocks of cities, and urban planners in countries from France to Japan were inspired by his vision. Back at home, the garden city brand soon caught on. Letchworth and Welwyn, founded in 1903 and 1920, respectively, were perhaps the closest the UK came to proper 'Garden Cities'. But within the first two years of its formal opening Letchworth attracted only 1,000 residents. At Letchworth's residential college, residents slept on hammocks and grew wheat, each grain getting individual attention; the result was mainly weeds and thistles. But even Letchworth and Welwyn came to cast off the principles of communalism and self-sufficiency that Howard imagined. Fearing collapse and loss of investment (and noting, perhaps, the first residents' ill-fated attempts at agriculture), the directors of the first garden city company never transferred authority to the citizens of these communities. Today these garden cities are largely middle class commuter towns.

At the present context, the principles of collective land ownership, long-term stewardship and land value capture for the benefit of the community could not be more relevant now. But it requires strong political leadership. Development in this country is led by short-term local politics and dominated by volume house-builders, whereas garden cities do not begin to pay back until twenty or thirty years later. Hence the Fabian society can be the ultimate result combining crafts society and garden cities.

4.5. THE FABIAN SOCIETY: THE CONCLUSION

The Fabian Society is a British socialist organisation whose purpose is to advance the principles of democratic socialism via gradualist and reformist effort in democracies, rather than by revolutionary overthrow. It aims to promote greater equality of power, wealth and opportunity; the value of collective action and public service; an accountable, tolerant and active democracy; citizenship, liberty and human rights; sustainable development; and multilateral international cooperation. The theory of Morris and Howard, both reflects the ideas of the Fabian society. Thus their utopias can be termed as '***Fabiopia***'.

Morris's literary insights into the social and aesthetic implications of human living arrangements, in turn, anticipated and influenced Ebenezer Howard's more gradualist views in *To-morrow: A Peaceful Path to Real Reform* (1898, revised as *Garden Cities of To-morrow*, 1902), and through Howard's work, many subsequent attempts to put cognate ideas into practice.

The pairing of community and sustainable development has dominated the international policy agenda for at least three decades with its assertion that the imperatives of capital accumulation can be balanced for the needs of social reproduction (Raco,2005,p .12). As a framework of state strategy, the concept of sustainable communities has come to define a particular mode of governance in which responsibility for ameliorating the impact of unfettered growth is devolved to place-based voluntary and community associations (Mayer, 2000,p.72).

The sustainable community has a noble pedigree in place-based projects of visionary design and the fusion of nature and nurture. Its antecedents are rooted in a renunciation of capitalism, in the collectivist communities of Ebenezer Howard (1902) and in William Morris' (1890) anarchist naturalism.

Neighborhood planning has unfurled a starkly unequal landscape in which a plurality of sustainable communities has appeared. This is a patchwork politics of place, structured by the demands of capital accumulation into winners and losers. Under neighborhood planning, the task of communities is to attract development while seeking to mitigate its negative effects and render it sustainable. The community is imagined as a market place in which sustainability can be bought and development rights sold. The disputed concept of the sustainable community now inspires a plethora of projects attempting to regulate an unrestrained development market or fill a vacuum in state investment planning. Neighborhoods may seek to acquire public goods through otherwise undesirable development, utilize their resource of social capital to stimulate enterprise, or rely on unpaid labour to meet their collective needs. The future of sustainability will be etched in these precarious attempts to piece together a new umbrella of environmental and social protection.

Since the rise of the modern industrial cities, landscapes and the incorporation of landscapes have served the dual-purpose of alleviating the negative effects of rampant urbanization as well as serving as tangible emblems of progress and development. These landscapes are not solely beautification schemes, but are latent with ideological agendas. Worldwide, landscape has been used as a powerful ideological medium, more popular, more versatile, easier to implement than

architecture or technical progress. These landscapes are capable of conveying the same signifiers as other more tangible emblems of modern progress. (Koolhaas, 1998,p.18). Howard's garden city concepts were filled with utilitarianism ideas about the social equalizer of landscape. Le Corbusier's incorporation of greenery was filled with ideas of rational and scientific progress of greenery as well as methods to decontextualize the city from its surrounding environs.

In Singapore, landscape and the garden city have been employed on a multiple levels. On one level, the garden city concept has been used with the strategic intent to justify urban renewal and the cleansing and sanitizing of habits and lifestyle choices of urban inhabitants. On the other level, landscape has been a way to maximize tourism potential and rebrand a city based not on emblems of the past as a chaotic and dirty city but as a global city that can compete and function more efficiently with the likes of London, Tokyo, and New York. Malaysia has used landscape to display and proclaim its national prominence in the form of a new capital city, Putrajaya, as well as juxtaposing it with architectural symbols of technological superiority such as the airport and the Petronas Tower. Increasingly sustainability and green architecture are becoming the new ideological medium for which global cities, especially in the developing world, are showcasing their rise in national prominence. Masdir City in Abu Dhabi is a supposedly sustainable city of 50,000 with zero waste and zero energy. While the actual sustainability of such a city is questionable, there is no denying that Abu Dhabi is using this city to counteract its image as an energy-intensive oil-fueled wealthy enclave. As cities in the developing world continue to compete and outdo each other with green efforts, it is increasingly becoming apparent that the motivation for these initiatives is less

about reducing tangible impacts on carbon footprints and global warming. Instead, new forms of green urbanism are more about projecting a manufactured image of sleek, modern, global and clean cities.

The notion of sustainable urban form has its roots in the Garden City movement at the turn of the century. Just as cities provide a place for humans to live, so they destroy ecosystems and become unfit habitats for the human spirit. The city must be made more vital, humane, efficient, beautiful, self-sufficient and natural through a return to a more compact form; its impact on the environment must be decreased. Howard gives precise prescriptions for the new city down to the acre-age and expenses, where 6000 acres of cheap rural land are to be purchased, 1000 of which are reserved for the city of 32000 person population capacity, exceeding which a new city have to be colonized. This provides a limit to the population density as well as provides stability to the natural resources. Again the wide roads, the grand avenue, public and private lawns provides a scope for large amount of open spaces all around the town. Garden Cities as were proposed to use local materials for construction, which helps in sustainability of the towns as well as the natural resources.

Howard identified real social inequities arising from industrialization as many of his peers had, and he believed these could best be addressed at the local level, what he notes as a pro-municipal scope. His advocacy for rational planning over the chaotic growth of piecemeal evolution has some merit in a rapidly modernizing context. Howard envisioned everything and all the commutation within the town itself and everything was supposed to be fairly self-sufficient with labour, but at the same

time, the railway services were put outside the town because it mainly served the industry and he understandably wanted to keep this away from the garden centre.

Critical analysis of garden city shows, two diametrically opposed, dramatically contrasting, inevitable types of beauty are being displaced by one drab, revolting neutrality. Rural influences neutralize the town and urban influences neutralize the country. In a few years all will be neutrality. The strong, masculine vitality of the town; the softer beauty, the richness, the fruitfulness of the countryside will be debased into **one sterile hermaphroditic beastliness**.

Garden city idea can be effectively re-invented in the form of green-belted suburban 'pedestrian pockets' linked to central cities by a network of light-rail transportation systems. Howard set in motion new ideas about hierarchy of services within the city, the essential components of community, being planned with clear zoning principles. Whilst the ideas about hierarchy and zoning were not original in themselves, it was the holistic approach that Howard adopted that helped lend the towns legitimacy. The idea of the agricultural belt, the bounded city, is directly responsible for policies of **Green Belt** that has since evolved and changed but essentially remains about constricting and controlling urban growth. The most enduring legacy beyond the physical make-up of the city is the importance Howard gave to creating a sense of community and harboring relationships between human beings, enhancing them through good planning and design that promoted sociability.

For sustainable development and sociability, the development of the human capital is of utmost necessity to check urbanization, resource management, food production

and consumption, control encroachments and mobilization etc. Scientists, technology developers, managing authorities must recognize their contextual value and shift from reductionist, linear, incremental thinking to a holistic cyclical, revolutionary outlook, which strives for renewable resources and eco-centric development. Community development must include rights to a healthy life which is ensured through nature, right to access resources, that is proper mobilization and utilization of local resources, right to political voice, which overall moves forth towards civic environmentalism (Bhargava, 2003,p.27). When the civic sense of the human capital is considered and improved with reference to the nature for a holistic development, an ecological utopia is formed.

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CHAPTER V

THE ECO-ETHICAL MODES IN INDIAN *VASTU* LITERATURE

5.1. INTRODUCTION TO INDIAN *VASTU SHASTRA*

Vastu Shastras are canons dealing with the subject of *vastu* which means the environment. Put differently, one may regard them as codification of good practices of design of buildings and settlements or towns, which will provide settings for the conduct of human life in harmony with physical as well as metaphysical forces. These *Vastu Shastra* canons provide guidelines for design of buildings and planning of cities such that they will bring health, wealth and peace to the inhabitants.

Vaastu literally means 'house' or 'dwelling place' of human beings and is derived from the root 'vas' which means 'to live' or 'to reside'. *Vaastu* is a broad term that also includes the following:

Bhoomi – which means the site/plot or extent of land where the building is proposed.

Prasada – which includes the compound wall and buildings which are built within the Bhoomi (Site).

Yaana – which means all the vehicles parked within the Bhoomi (Site).

Shayana – which includes all the furniture and utensils in the building (Prasada).

Vastu is also derived from the sanskrit word '*vasathi*' which means 'comfort' (Padam, 1998,p.5). Comfort is related to the right proportion and positioning of the five elements *Agni* (Fire), *Vaayu* (Air), *Vaari* (Water), *Prithvi* (Earth) and *Akash* (Sky) in our surroundings. The complex interplay of the above elements along with

the eight directions (E, W, N, S, NE, SE, SW, NW) can profoundly influence the lives of the people living or working in the premises either positively or negatively.

Shastra is the sanskrit word for 'science' and stands for the principles and guidelines laid down for the construction of a building. Therefore, *Vaastu shastra* is the science of arranging the above-mentioned elements in their respective places so that they are in harmony which in turn will make the lives of the inmates happy and peaceful.

The fundamental principle of *Vastu Shastra* is to add 'Value to the Life of the man' (Padam, 1998, p.13) staying in a building by bringing about harmony between the inmate, nature and the built environment. *Vastu Shastra* has evolved over centuries and from experience it has been documented that the improper positioning of rooms with respect to the elements causes an imbalance. When the harmonics between elements gets disturbed, our energies get dissipated in different directions leading to stress, tension and ill-health.

However, the right application of *Vastu Shastra* principles can create a balance between the building structure, the five elements and the cosmos. This equilibrium between the internal and external energies, ensures a healthy body and happy mind which leads to health, wealth, happiness and success. So, it is wise and probably necessary to follow *Vastu Shastra* guidelines in the design of a building. But it is not always possible to, rigidly follow all the guidelines because of limitations in the sites. So, that is where the understanding of the science behind these principles is beneficial, as it allows us to apply it to buildings to create well-lit, bright, well-ventilated, spacious and well-designed spaces (rooms).

5.2. FACTORS OF *VASTU SHASTRA*

The factors affecting human habitation are nothing but the factors influencing *vastu* science. These factors are called elements governing the *vastu* science, as they are unique and individual in properties and effect.

1.Five elements(Panchabhutas):

Vastu rests on the assumption that the Earth is a living organism out of which other living creatures and organic forms emerge, and so every particle on Earth possesses 'live energy'. The life on Earth is possible because of the five basic and essential elements known as the *Panchabhutaas*. They are *Aakaasha* (Space), *Vaayu* (Air), *Agni* (Fire), *Jala* (Water) and *Bhoomi* (Earth). All creatures on the Earth including buildings are physically made up of these elements.

Space (*Aakaasha*) – is the unending region beyond Earth in which not only our Solar System but the entire Galaxy exists. It provides shelter to the other four elements. The effective forces of Space are light, heat, gravity, magnetic field and waves.

Air (*Vaayu*) – the atmosphere above the Earth consists of Oxygen (21%), Nitrogen (78%) Carbon Dioxide, water vapor, Dust etc which are all essential for living things and even fire to flourish. Human physical comfort values are directly and sensitively dependent on correct humidity, air flow, temperature of air, air pressure, air composition and its content.

Fire (*Agni*) – It represents light and heat without which life will be extinct. It also represents days and nights, seasons, energy, lightning, volcanic heat and all other aspects of the Sun and the solar system. The enthusiasm, passion, vigour in living things is because of light and heat only.

Water (*Jala*) – Represented by rain, river, sea and is in the form of liquid (water), solid (ice) and gas (steam, cloud). It is a combination of Hydrogen and Oxygen in the ratio of 2:1 and is perfectly neutral. Every plant and animal is composed of water in different proportions.

Earth (*Bhumi*) – Earth, the third planet in order from the Sun, is a big magnet with North and South poles as centers of attractions. Its magnetic field and gravitational force has considerable effect on everything on the Earth, living and non-living. The Earth rotates about its axis from West to East, resulting in day and night. It revolves round the Sun once every year (365.25 days) and is tilted at an angle of 23.5 degrees, because of which seasons are formed. Because of the Earth's tilt, a year is divided into 2 periods – *Uttaraayana* from Jan 14 – July 15, when the Northern Hemisphere (India) is tilted towards the Sun and *Dakshinaayana* from July 16 – Jan 14, when the Southern Hemisphere (Australia) is tilted towards the Sun. In *Uttarayaana*, the days are longer than the nights and vice-versa during *Dakshinaayana*.

All these five elements sustain life on the planet and are neutral, unbiased and impartial to us- yet we cannot control them. There is an invisible and constant interaction between these elements. In an open field these elements operate freely

and are in equilibrium. However, when a structure is placed in this field, the equilibrium is affected because these elements act for or against each other to create either harmony or disharmony. If there is disharmony, then the equilibrium needs to be restored so that the cosmic energy flows harmoniously. Animals, Birds, Insects, Plants have natural defenses against a wide variety of unfavorable climates. They adapt their body size, shape or temperature to adjust with the hostile climate. But some creatures like termites, birds, ants not only adapt to nature, they seek to create a comfortable living environment by building a suitable home.

Similarly, for centuries, man has manipulated the five elements to build comfortable houses even in the most hostile environments. For example, in the Desert, where the heat of the Sun (Fire) can make it impossible to live, man has built houses with internal courtyards (Space), thick walls (Earth), slit windows (Air) and water bodies and fountains (Water) to cool the house by ensuring good ventilation and flow of air, just like the termites mentioned above. But unfortunately today, man gives precedence to the appearance and size of his house as his social position and personal ego are more important. In the process he has forgotten to manipulate the elements to create a naturally comfortable, airy house. To create comfort he is forced to use gadgets like Fans, Air Conditioners, and Heaters etc which consume so much of energy and are believed to be unhealthy too.

2. The Sun and its effects:

Sunlight has two spectra – the visible spectrum and the invisible spectrum.

VISIBLE SPECTRUM – The visible spectrum consists of white light which is a combination of seven main colours called 'VIBGYOR' which stands for the colours, Violet, Indigo, Blue, Green, Yellow, Orange and Red. These Colours, depending on the colour and intensity have deep psychological effects on a person's moods and hence have to be used sensibly for creating a good, positive environment. The effect of colours has been explained under *Vastu* Colours of a House.

INVISIBLE SPECTRUM – The invisible spectrum flanks the visible spectrum on either side and consists of the Ultra Violet (Chemical) Spectrum and the Infra Red (Thermal Heat) Spectrum. The Ultra-Violet (UV) rays have a shorter wavelength than the visible light rays and are invisible. They kill bacteria and aid in the synthesis of Vitamin D in our bodies. The Infra Red rays have a longer wavelength than the visible light rays and are also invisible. They are the cause for the heat of the sunlight. The Sun illuminates the Earth and it sustains life. It is for these reasons that Indians, from time immemorial, worship the Sun God also known as Surya.

Sustain life – Plants make glucose (energy rich food) from Carbon dioxide of the air and water in the presence of sunlight and release oxygen as a by-product into the air. This process called Photosynthesis is absolutely necessary to sustain life on Earth, because all living things get a continuous supply of oxygen and animals get food (Carbohydrates) from the plants.

Illuminates the Earth – The white bright light of the Sun illuminates the Earth and is the reason we are able to see. Even the colours we see all around is because of the Sunlight since it contains all the possible colour variations. When sunlight falls on a

coloured object, it reflects the light of the object's color into our eyes while all the other colours of the light are absorbed into that object, giving us the perception of colour. Thus, an apple appears red because it reflects red light.

The main aim of *Vastu Shastra* in designing a house, is to ensure that the inmates of a house are inadvertently exposed to the useful rays of sunlight while performing their activities, even if they are inside the house the whole day. But during a day, people perform different activities in different rooms at different times and the Sun's position keeps changing from sunrise to sunset. So to ensure that the inmates get exposed to sunlight constantly, each room is positioned so that it faces the Sun at the time of the day when it is most likely to be used by them. This has been prescribed in an ideal plan called the *Vastu Purusha Mandala*.

The *Vastu Mandala* is a square, metaphysical plan of a house which shows the position of the rooms of a house. In the *Vastu Mandala*, the rooms have been positioned in specific directions, keeping the beneficial effects of the Sun in mind. They are explained here:

Water source, wells: The water source, wells are preferred on the East and North sides of the house so that the UV rays of the morning sunlight can kill the germs and purify the water before you start using it.

Kitchen: It is advisable to have the kitchen platform on the Eastern side so that the morning sunrays will destroy the germs on the kitchen counter and prevent the food from spoiling. Moreover, the person who is cooking is inadvertently exposed to the

useful, morning sunlight. (In the olden days, women stayed at home and never stepped out, and so this was a way for them to get exposed to the beneficial sun rays).

Windows: There should be fewer windows on the South and West side, and the walls should be thicker to reduce the heat. However there should be more windows in the North and East to allow constant sunlight into the House.

Toilets, Store rooms: Lesser used rooms like the toilets, store rooms etc should preferably be on the West side as they tend to get hotter. Moreover they serve as buffers and prevent the rest of the house from getting heated up. And the heat keeps these rooms dry and free from moisture, germs, fungus etc.

Balconies, Terraces, open spaces: More Balconies, terraces and open spaces are desirable in the East and North sides again for the same reason as above.

Trees: It is advisable to have tall trees on the South and West sides, to protect the house from the direct sunlight and also to give pure oxygenated air to the inmates (since trees and plants produce oxygen during the process of photosynthesis).

3. The Earth's Magnetic Field:

The Earth's magnetic field is similar to that of a bar magnet with one pole near the geographic North pole and the other near the geographic South pole. The Earth's magnetic field is mostly caused by convection of molten iron within the outer liquid

core, along with a **Coriolis effect** caused by the overall planetary rotation, which organizes these electric currents in rolls aligned along the North-South polar axis.

It is scientifically known that the Earth's magnetic field affects humans and animals in different ways because every cell within them not only reacts to electromagnetic currents but also produces them. For example the Earth's magnetic field could generate electric fields and currents around the heart and slightly impede the flow of blood.

Humans: Psychiatrists have noticed a correlation between increased geomagnetic activity and increased suicide rates and clinical depression. This has been explained by Kelly Posner, a psychiatrist at Columbia University in the US: 'The most plausible explanation for the association between geomagnetic activity and depression and suicide is that geomagnetic storms can desynchronize circadian rhythms and melatonin production. The circadian regulatory system depends upon repeated environmental cues to synchronize internal clocks, and magnetic fields may be one of these environmental cues. Geomagnetic storms could disrupt body clocks, precipitating Seasonal Affective Disorder (SAD) and therefore increased suicide risk' (National Mission on Sustainable Habitat,2010).

Herd animals: It has been observed that cattle and other herd animals, such as red and roe deer apparently don't just stand around randomly chewing the cud – they in fact behave like huge compasses, aligning themselves with magnetic north-south axis, as if involuntarily directed by the earth's magnetic field lines to the poles.

Lobsters: have been shown to exhibit magnetic sensitivity, relying upon the earth's magnetic lines to navigate.

Birds: Though it's not conclusively proven, there is compelling evidence that birds can actually see the Earth's magnetic field. Their eyes contain specialized light receptor molecules that communicate with the visual center in the brain, just as a compass relies on a tiny magnet to tune in to the earth's magnet.

Baby sea Turtles: rely on the earth's magnetism to make their way to and fro in the Atlantic Ocean (that's 8,000 miles round trip). Their bodies tell them when they've strayed off course- it's just like having an internal GPS.

Though geomagnetic storms have a negative effect on humans, on the positive side, it has been observed that the stronger magnetic North pole (Earth's geographic South) has a positive effect on the body while the magnetic South pole (Earth's geographic North) has a negative effect. The reason for this has not been scientifically explained. But this effect has been likened to a shower. The shower head is symbolic of the magnetic North pole's energy. It is fresh, clean and powerful in its delivery whereas the magnetic South Pole is similar to the drain. The grungy, spent water flows more slowly down a bigger opening. It is astonishing that the ancient Indian pundits, so many thousands of years ago, knew of the adverse and positive effects of the Earth's magnetic field on humans. Thus the Earth's magnetic field became an important *Vastu Shastra* factor and was taken into account in the designing of buildings. One of the goals of *Vastu* in designing buildings, is to ensure that humans are constantly aligned in the right magnetic axis while they are inside

the house, so that the Earth's magnetic field has a positive effect on them rather than the opposite.

4.Cardinal Directions:

According to *Vastu Shastra*, the entire universe exists in endless space and has no direction whatsoever. However, on Earth our directions are defined with respect to the Sun and there are eight cardinal directions. They are:

East (*Poorva*): It is common knowledge that the Sun rises in the East.

West (*Paschima*): The Sun sets in the West.

North (*Uttara*): When one faces the East, the direction to the left is the North.

South (*Dakshina*): When one faces the East, the direction to the right is called the South.

The corner where two Cardinal directions meet, is also significant since it combines the forces emanating from both the directions.

North-East (*Eeshanya*): This is where the North and East meet.

North-West (*Vaayavya*): This is where the North and the West meet.

South-West (*Nairuthya*): This is where the South and the West meet.

South-East (*Aagneya*): This is where the South and the East meet.

The Sun sustains life and is very important to living things. Since the directions are defined with respect to the Sun, the cardinal directions are also an important *Vastu* factor. In *Vastu Shastra* it is believed that the right disposition of the rooms of the house with respect to the eight cardinal directions has a direct positive influence on the residents.

Since the *Vastu pundits* knew of the importance of sunlight to humans, along with the Sun, the eight cardinal directions were taken into account in the design of buildings. The main aim of *Vastu Shastra* is to ensure that the inmates of a house are inadvertently exposed to the useful rays of sunlight, even if they are inside the house the whole day. But during a day, people perform different activities in different rooms at different times and the Sun's position keeps changing with respect to the cardinal directions. So to ensure that the inmates get exposed to sunlight constantly, each room should be positioned in a specific cardinal direction so that it faces the Sun at the time of the day when it is most likely to be used by them.

Vastu Shastra prescribes a plan called the *Vastu Purusha Mandala*, in which each room (depending on its function) is located in a specific cardinal direction and to make it easy to remember, *Vastu* assigns symbolic gods (who have certain inherent qualities) to each of the eight cardinal directions. For example, the Kitchen (where cooking is the main activity) is positioned in the South-East direction and Agni, the god of fire is assigned to this direction.

5.Earth's Energy:

Vastu Shastra takes into account the various natural energies which are available free of cost on the Earth and in the atmosphere like: Solar Energy from Sun, Lunar Energy from Moon, Earth Energy, Sky Energy, Electric Energy, Magnetic Energy, Thermal Energy, Wind Energy, Light Energy, Cosmic Energy.

Prana is the Sanskrit for vital life. It is the notion of a vital, life-sustaining force of living beings, comparable to the Chinese notion of *Chi*. It is an auto-energizing force

which creates a magnetic field and permeates each individual as well as the Cosmos at all levels. This self-energizing force is the bond between the galaxies, the planets, humans and molecules which keeps the whole Cosmos in order. All beings are born through it and live by it. When they die, their individual breath dissolves into the cosmic breath.

The Cosmic Energy exists everywhere in the Cosmos and is essential to maintain the order of human life and to expand the Consciousness. Humans use cosmic energy in their day to day activities. In order not to feel exhausted and tired they need to get Cosmic energy through the day.

According to *Vastu Shastra,* there are invisible energy lines that run like a large grid across the Earth from North to South and from East to West. The electromagnetic field thus generated affects the human body at the cellular level and controls the organs of the human body. It is believed that when a structure is placed on Earth, the equilibrium is affected because the physical structure causes a break in the electromagnetic field. Hence this equilibrium needs to be restored so that the cosmic energy or *Prana* (read electromagnetic energy) flows harmoniously through the building as well as around it.

It is surprising that the *Vastu pundits* of ancient times knew of this life-force and so, *Prana* or the cosmic energy was considered an important *Vastu* factor and taken into account while designing buildings. One of the goals of *Vastu* in designing, is to restore balance between the building structure and the cosmos because when buildings echo the underlying cosmic principles, they vibrate in harmony with the

universe and these vibrations affect the inmates in a positive way creating peace, prosperity and contentment in their lives.

In *Vastu*, the movement of cosmic energy also called *prana* through a 4-sided building is believed to be similar to the flow of energy across the Earth. It flows in a definite direction- from the North-East direction towards the South-East and North-West corners before heading to the South-West. Keeping this flow in mind, *Vastu Shastra* prescribes an ideal plan called the *Vastu Purusha Mandala* to ensure that the *prana* or cosmic energy moves smoothly through a building and around it.

Every creature on Earth starts its activities at sunrise and goes to sleep after sunset and therefore the Sun, assumes a lot of importance to living things. Because of the importance of sunlight to humans, the main aim of *Vastu Shastra* is to ensure that the inmates of a house are inadvertently exposed to the useful rays of sunlight while performing their activities, even if they are inside the house the whole day. But during a day, people perform different activities in different rooms at different times and the Sun's position keeps changing from sunrise to sunset. So to ensure that the inmates get exposed to sunlight constantly, each room in the *Vastu Mandala* is positioned so that it faces the Sun at the time of the day when it is most likely to be used by them.

At the crack of dawn, the Sun is positioned in the North-East direction. Then it moves to the East, South-East, South, West and North-West in India. In the *Vastu Mandala*, the main entrance door is positioned in the North-East corner to ensure that the early morning sunlight floods the house. This explains why the *prana* or

life-giving energy is symbolically believed to enter from the North-East, early in the morning.

5.3. PRINCIPLES OF *VAASTU SHASTRA*

Vastu Shastra, an ancient mystic science for designing and building, unifies science, art, astronomy and astrology. The goal of *Vastu Shastra* is to restore the balance between buildings and the universe so as to make the lives of the inmates better. *Vastu* lays down some principles which are set, rigid rules and were originally carefully guarded and meant for only temples, palaces and for the elite.

This is because the *Vastu* factors namely the elements of Nature, Sun's effects, Earth's magnetic field, cardinal directions and Earth's energy fields have not changed over the centuries and *Vastu Shastra* is essentially the science of manipulating the above-mentioned *Vastu* factors in a building, so that they are in harmony which in turn will make the lives of the inmates happy and peaceful.

There are five fundamental principles on which *Vastu Shastra* stands and they are:

i. Site orientation – also called *Diknirnaya*.
ii. Site planning – also known as *Vastu Purusha Mandala*.
iii. Proportions of the building – also known as *Maana*.
iv. Dimensions of the building– also called *Aayadi*
v. Aesthetics of the building – also known as *Chanda*.

A look into these principles will help to dispel the ignorance about *Vastu Shastra*: that it is only a spiritual science meant for the construction of beautiful temples and

is not useful for the design of Houses and other secular buildings. These principles are a guide for designing and planning a proportionate, aesthetic and beautiful building with the right measurements.

Vastu is a logical explanation of scientific truths and facts. These *Vastu* Rules are basically derived from few properties of our Mother Earth. By strictly following these *Vastu* Rules, human race can gain quite a lot of benefits and live peacefully. In other words *Vastu* rules instruct the ways to create buildings in harmony with the Nature.

Vastu Shastra is based upon two important scientific facts:-

i. Magnetic Property of the earth and the gravitational and magnetic forces created by the materials inside the earth.
ii. Rotation of the Earth on its axis, and the centrifugal and other forces created by its movements.

Magnetic Property of the earth:

Our Mother Earth was created from the minerals and dust from the lava of Sun millions of years ago. Due to the large content of iron particles present in the form of solid and molten state in our Earth, it has a magnificent magnetic property. The North Pole emits the positive magnetic energy and the South Pole performs the Negative part receiving this energy. Hence our Earth is surrounded by a magnetic field all over its mass.

If we break a small magnet in to pieces, each part will get its own North and South poles and start acting as an individual magnet. Similarly, when the earth is divided into small parts as an individual property, every division will attain a magnetic field having its own North and South Pole. As the buildings are constructed with the materials containing iron particles this magnetic effect is further magnified. *Vastu Shastra* applies certain principles to gain from this magnetic force.

Rotation of the Earth:

The main logic behind almost all the rules of *Vastu Shastra* depends on these principles: We are traveling along with the Earth with all our belongings towards North East direction constantly at a speed of 1670 kilometers per hour. The forward direction is North East due to the inclination of the earth. The division of the earth, constructions buildings and utilization of the buildings shall not be against this motion.

Our Earth is rotating inclined about 23.5 degrees towards North East direction and rotates on its own axis without any rest since more than 400 crore years and also rotates the sun without any axles, bearings or motors. The weight we keep in our place should not hinder its movement.

A good example is loading a bullock cart, which runs on only two wheels and without any ball bearings. The cart man balances the cart by distributing the weight, so that pulling it is comfortable for the bullocks. Imagine how your car would strain to accelerate if you load heavy weight in its front side. The earth is rotating and

rolling towards the North-East direction, hence keeping heavy weight at that direction would strain its moment.

Vastu Shastra divides a place mainly into nine parts aligning with the directions: – North, East, South, West, North East Corner, South East Corner, South West Corner, North West Corner and Center.

5.4. IMPORTANCE OF *VASTU SHASTRA*

There are different Vastushastras for different regions on the earth and a few of them are:

i. *Maya's Vastushastra*, suitable to the region in between Vindhya range and Tungabhadra river in South India.
ii. *Vishwakarma's Vastushastra*, suitable to some parts in North India.
iii. *Bhrugu Samhita Vastu*, suitable to Dravida region in South India
iv. *Kashyapa Vastu*, suitable to some parts in North India
v. *Vastushastra* suitable to China and many regions on the earth

Development of these various types of *Vastushastra* on regional basis shows that, implementation of *vastu* differs depending on the region to which the building construction belongs. But the science behind all these *shastras* remains unaltered.

The elements and principles of *Vastushastra* give a meaning to life ad its existence. The ancient means of knowing direction were the direction of sunrise, sunset and the position of polar star etc. A detail analysis of the eight directions as per the *vastushastra* explains the importance of orientation as follows:

1. East (Indra):

It is known that the earth is a planet of the sun. The earth is originated by the sun and so the sun becomes the cause for every element on the earth namely air, water and fire. Like this the sun becomes the kind of all elements. Such a king according to the direction is towards East. So Indra the king of Gods is attributed towards East.

2. South East(Agni):

The fire is the cause to the heat and vice versa. The heat energy is the conversion of the light energy, received by the sun. With respect to India, sun's apparent displacement between North 23.5 degree latitude and South 23.5 degree latitude is more towards the south. Since sunrise till noon, there is an increase in temperature and afterwards there is a decrease in temperature. Till noon, the sun is called as a rising sun and afterwards a setting sun. The rising sun, with respect to India, is effective more at South-East corner of a site. So the South-East corner is called as Agni Corner. So the name Agni is attributed to this corner.

3. South (Yama):

Yama means the religious king or the son of the sun which has the authority to keep the accounts of deeds of all the souls. The Earth is attributed to the south. Earth is called the son of the sun as it keeps the accounts of all deeds of the souls. It is only the earth which is the witness to all deeds of every animal, between their every birth and death.

4. South West (Nirutya):

Niru means ‘dust’, ‘powder’. This is the direction at which, south west monsoon enters India. These winds carry dust and powder at their first appearance every year. So the name *Niruti* is attributed to south west direction.

5. West (Varuna):

Varuna means ‘king of ocean’ or ‘God of water’ or rain. The first rain every year is received from west in India. Also the rain is one of the major source of drinking water and the major source for cultivation. The region receives major part of its rain from the west. So the name *Varuna* is attributed to the western direction.

6. North West(Vayu):

Vayu means the wind. This angle is considered to be the place of *vayu*. This angle provides us long life, health and power. If this angle is faulty,then friends turn into enemies and also it causes the warm loos to power and thus to destroy.

7. North (Kubera):

Kubera means ‘the lord of money’, Vishnu. Vishnu means the savior. The prime quality of a savior is the patience. Physical representation of patience is coolness and stillness. The north side of any building in the said region is cooler compared to any other corner. So *Kubera* is attributed to the north direction.

8. North East (Lord Shiva, Ishwara):

Ishwara means ‘owner’. This name is attributed owing to the snow-clad lofty Himalayas standing like a gigantic wall all along the North East boundary of India.

The Himalayas stretch over a length of about 2400 km. The Himalayas have all the qualities of an owner. They protect India from the cold winds blowing from the north. They have given rise to many big rivers like the Ganges, the Brahmaputra, the Jamuna, and the Indus etc. These rivers have greatly contributed to the fertility of the North Indian plains. The area covered by north Indian plains is about 18.5% of the total area of the nation. Himalayas also feed the rivers with the snow water in summer, so the rivers are perennial. These rivers provide irrigation and hydel power. Himalayas cause rainfall in the northern parts of India by obstructing the monsoon winds. They are a great source of forest and mineral wealth to India. Hence the North East corner is attributed to Ishwara, the owner.

5.5. *VASTU PURUSH MANDALA*

Vastu purusha mandala is the metaphysical diagrammatic design of cosmos on which the whole concept of *Vastu Shastra* is based. According to Hindu mythology, in the beginning, Brahma, the creator of the Universe, experimented with the creation of a new creature (Ananth,1998,p.32). He created a large cosmic man, who grew rapidly as he began to devour everything in his path to satisfy his insatiable hunger. When he became so big that his shadow fell on the Earth creating a permanent eclipse, the gods Shiva and Vishnu begged Brahma to do something before everything was destroyed by this Creature. Brahma realised his mistake and called the *Astha Dikapalakas*, the Gods of the eight cardinal directions. Together, they overpowered the monster and held it flat against the earth. Then Brahma jumped in the middle and held the monster down.Then the Monster cried asking why Brahma created him if he had to punish him, Brahma offered him a compromise and

made the Monster immortal with the boon that he would be worshiped by any mortal that builds a structure on earth. He was named *Vastu Purusha*.

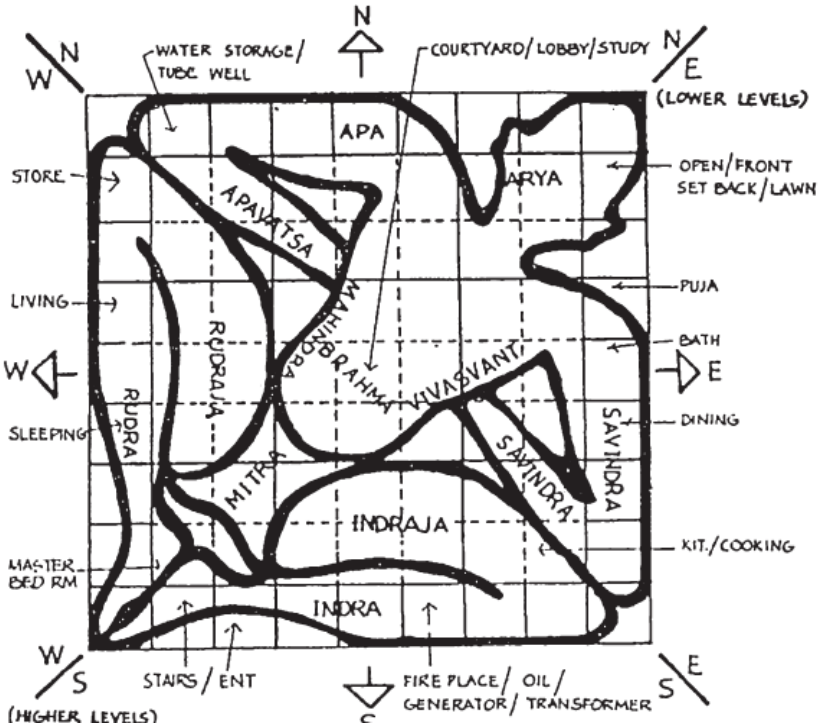

Figure.2: The Vastu Purush Mandala and the significance of directions

It is believed that *Vastu purusha* is lied down on the cosmos which constitutes energies in a way that his head is resting in North-east direction which represents balanced thinking; lower body facing South-west which represents strength and firmness; his navel is in center of the earth signifying cosmic awareness and holiness; his hand face North-west and South-east which signifies energy.

Vastu purusha is the presiding deity while other eight directions have their own specific God that governs their direction. The mandala is basically enclosed area in which *Vastu purusha* is lied down signifies his birth from nature. On the basis of this

structure and prescribed directions construction is recommended and all the physical features are decided in terms of ventilation, doors, windows, location etc.

The *Vastu Purush* can be explained in two categories:

1) *Vastu Purush* of the site
2) *Vastu Purush* of the year

***Vastu Purush* of the site:**

In this concept, *Vastu Purush* is represented by a figure resembling the human body. The head of the body is drawn towards North-East, and the legs towards South-West. The whole body is fitted into a square. This square is divided both longitudinally and laterally into nine divisions. According to this concept, while constructing a building for human habitation, the *Vastu Purush* figure should be imagine as if it is laid over the site of the building construction according to the directions. After the process of imagination, the actual positioning of different rooms of specific functions is found out. Then it is necessary to know how the different organs of the *Vastu Purush* are assigned representing the different elements of the corporeal world.

i. **The element Sun is assigned to the eyes:**

Vastu Purush with his head towards North-east has turned to his left,which means his sight is on the south east corner of the site. So (Agni) Sun corner is found and this southeast corner is meant for such purposes like kitchens, kilns etc in a house.

ii. The element Wind is assigned to his vital breath:

The direction of respiration is from South-west to North-east and vice versa. In India, the wind direction is from South-west to North-east and vice-versa. The importance of the element Wind in positioning the rooms of a building cannot be ignored because it effects the ventilation of the building.

iii. The element Sky is assigned to his Navel:

It is known scientifically that the navel point of the building is the meeting point of all energies owing to the five elements. So the central point is attributed to the element Sky. This point is also the centre point of the building where all energies meet. Thus the central part of the building, during building construction is left open to the sky to facilitate the natural movement of the air and light.

iv. The element earth is assigned to his feet:

Feet are the first organs to hold the body weight, when it stands on its legs. The strength in feet decides the stability of the body. So also the strength of the earth above which the building stands decides the first stability of the building. So the element earth is assigned to his feet.

Vastu Purush of the site is thus used as a tool to find out the locations of the elements in the site proposed for building construction.

***Vastu Purush* of the year:**

Just s a year is divided into months and further into days, the concept *Vastu Purush* of the year is divided into cycles and a cycle into duties of *vastu purush*. The *Vastu*

Purush rotates and completes one full circle in a year. It goes through eight positions during its traverse. In this process, there are four cycles and each such cycle is divided into six periods which can be termed as duties of the *vastu purush*.

The science behind the concept of *vastu purush* of a year is the apparent displacement of the sun. Sun's to and fro traverse is owing to the revolution and rotation of the earth. The duties of the *vastu purush* and their time of occurrence do not remain same in the whole world. They change owing to the geographical conditions of a region. So *vastu purush* of the year is used as a tool to find out the duties or functions of the *vastu purush*.

5.6. CLIMATE-RESPONSIVENESS OF THE *VASTU SHASTRA*

Cosmic force is one of the main influence on which *Vastu Shastra* is based. Cosmic influence: heavenly bodies in the celestial space influence the activities on the surface of the earth, the Sun being the main source of energy is regarded as the major influencing factor. Sun, one of the most important heavenly bodies associated with divineness is considered as the purifier of soul and space. Besides defining the orientation of a room, building, temple and the city, the Sun also determines the arrangement of spaces and objects in a space based on the sequence of activities carried through a day.

Similarly, design strategies for passive heating and passive cooling of buildings also are based on their climatic context and the orientation with respect to the sun. The dimensions of architecture which are a derivation of the ancient theories and which relates *vastu shastra* to climate responsive architecture can be explained as follows:

i. Time, which has been called the fourth dimension of architectural space, is of importance because every object cannot exist but in time. The notion of time gives life to an object and relates to seasonal and diurnal patterns and thus to climate and the way that a building behaves or should be designed to couple with and not antagonize nature. It further relates to the dynamic nature of a building in contrast to the static image that we have created for it.

ii. Air is the second invisible but important element. We create space and pretend that it is empty, oblivious of the fact that it is both surrounded by and filled with air. Air,in its turn, is very much there and alive due to its movement which is generated by either temperature or pressure differences. And related to the movement of air should be buildings shapes, sections, heights, orientations and the size and positioning of openings.

iii.Light, in particular daylight, is the third important element. Architecture cannot exist without light and from the time we have been able to substitute natural light with artificial lighting, many a building and a lot of architecture has become poorer. It is not an exaggeration that the real form giver to architecture is not the architect but the light, and these explain the *vastu* elements of '*Panchbhutas*' (Padam,1998, p.45).

5.7. VASTU PURUSH, VITRUVIAN MAN AND MODULOR: AN ANALYSIS

Vastu Purush Mandala is a pattern in which ***Purush*** represents the cosmic man and ***Mandala***, the mathematical representation of the cosmos. Together they represent

proportional system for the building keeping in mind maximum wellbeing of the residents.

The Greeks developed classical orders based on the human proportions. Vitruvius, the famous architect of the 1st century, studied classical proportions and defined the **Vitruvian man** later sketched by Leonardo Da Vinci. In recent times swiss architect Le Corbusier developed a proportion system called **Le Modulo**r.

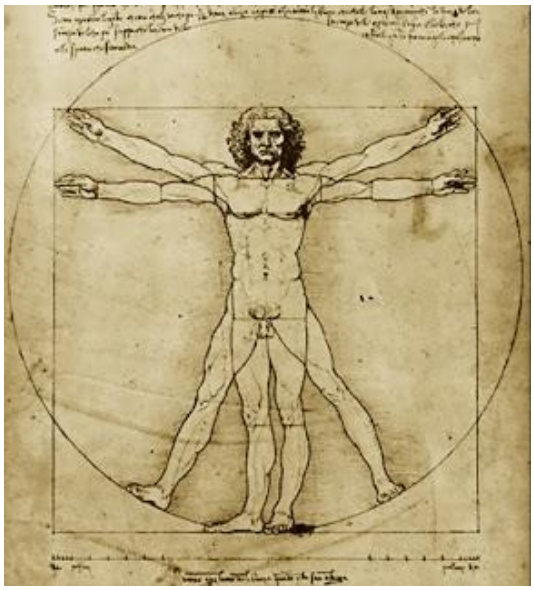

Figure.3. Vitruvian Man

(Source: Morgan,1914, p.30)

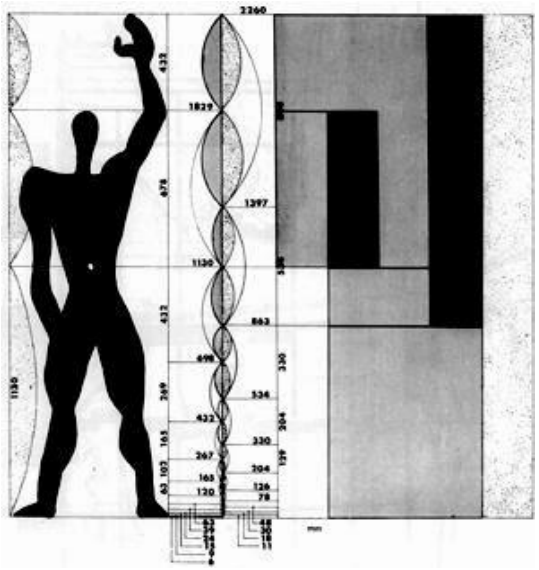

Figure.4. Le Modulor

(Source: Corbusier,1968, p.30)

Proportional systems were made, accepted, discarded, and modified. They were mathematical, spiritual or followed patterns in nature. Squares, triangles, circles and pentagons became hot favorites and were called sacred geometry for their perfect shapes and spiritual significance, but the essence remains the same.

Leonardo Da Vinci created the famous Vitruvian Man drawing around 1487. Based on the work of the Roman architect and engineer Vitruvius in the 1st century BC, this pen and ink drawing on paper with accompanying notes depicts a naked male figure in two superimposed positions with his arms and legs apart and simultaneously inscribed in a circle and square. Leonardo da Vinci's Vitruvian Man depicts the balance between man and nature, is static in structure, but dynamic in its vision, reveals the balance between man and his environment, and thus represents man's relationship to the universe. Though the Vitruvian Man marks an important turning point in the description of the secular age of the Eco technic era and the recognition of humankind as the centre of civilization, it still considers the cosmic relationship with the whole universe. It describes the two aspects: the material existence symbolized by square, and spiritual quality by the circle. Vitruvian Man is thus a representation of human design through structural and environmental relationships implicit in proportional form. Neither fully hiding nor disclosing it leaves traces of a bio-centrism which transcends the micro-scale development but which also conveys an agentic responsibility to the macro-scale or the whole ecosystem.

Nearly 500 years after the Renaissance, an architect, namely Le Corbusier, produced immutable human archetypes to derive architectural space. For him the **Modulor** was a universal instrument, easy to employ, which can be used all over the world to obtain beauty and rationality in proportions of everything produced by man. He described its proportions as a range of harmonious measurements to suit the human scale, universally applicable to architecture and to mechanical things. The outstretched arms and legs of a man form a square and a circle: the square

symbolizes the solid physical world and the circle the spiritual and eternal. Man bridges the gap between these two worlds.

Le Modulor is a mathematical derivation of the forms of nature in the ratio of **1:1.618**. Mathematics is the majestic structure conceived by man to grant him comprehension of the universe. It holds the absolute and the infinite, the understandable and the forever elusive. It has walls beyond which one may pace up and down without result; sometimes there is a door: one opens it enters- one is in another realm, the realm of the gods, the room which holds the key to the great systems. These doors are the doors of the miracles. Having gone through one, man is no longer the operative force, but rather it is his contact with the universe. In front of him unfolds and spreads out the fabulous fabric of numbers without end. He is in the country of numbers. Thus irrespective of different theories, it can be seen that nature has influence over every theory whether it is *Vastu* or Religion or Architecture.

5.8. VASTU SHASTRA: WAY TOWARDS SUSTAINABLE DEVELOPMENT

In this fast developing world, unless we have a firm commitment to sustainability, earthly resources will become extinct and thus making life chaotic. The sheer force of economic developments, especially in India and China, with their two-thirds of the world's population, could have a drastic impact on this already exploited planet. If we are to check and turn around the world from its path of inevitable self-destruction, an integrated, practical approach to sustainable development must be identified. Inappropriate human settlement, planning and indiscriminate material-use have depleted the earth's resources. Rationalizing an approach to land choice and use, water, sewage disposal, materials and community self-management will yield a

solution. Traditional knowledge plays an important role in controlling human aspirations and ensuring interdependence and sustainability. The resultant built form of Indian cities today is complex, amorphous and chaotic. It no longer reflects a coherent response and ambience to its environmental context. The situation is reaching a crisis stage and a sustainable ecological relationship with built form is missing in new settlements. Today, humans are more than ever before aware of a loss of totality, wholeness and harmony. There is fragmentation and alienation of humans at all levels: individual, societal, psychical and cosmic. This is the consequence of adopting borrowed notions of planning and development.

To understand the rationale for human settlement design as contained in the *Vastu Shastra*, one has to understand to devise a system that controls human settlement as an interest of sustainability, respecting the social fabric of the citizens, and their settlement. Sustainability is thus all about understanding the situation and developing methods that are equitable and that make sense ecologically, economically and socially.

The concept of sustainable development is close to what we learn from the Indian traditional knowledge, such as culture and heritage. Today, *Vastu Shastra* (an ancient science of architecture, planning and designing) has become more relevant for modern humans because the environment has gained importance due to air, water and land pollution, and dynamic changes in climate, population pressures and congested and overcrowded cities. The situation is reaching a crisis stage and a sustainable ecological relationship with built form is missing from new settlements. Consequently, it has become necessary to acquire the traditional knowledge of *Vastu*

for developing human settlements- such as Indian mega-cities, which can be transformed with the help of fundamental principles of *Vastu Shastra* (Rangwala,2011, 6).

Vastu Shastra shall be discussed through its culture, heritage and orientation towards forest sustainability, which shall further lead the way towards sustainability. Culture is the way a society lives, how its people behave and its religious expressions. These alter with time and place. In particular, the way humanity sees itself in relation to its surroundings is the fundamental reflection of human culture. Today, we are destroying nature in such a way that whenever nature stands in the way of what we want she is pushed aside. In the Indian perception, a human (*manav*) is a being that respects nature and a demon (*danav*) one that misuses nature. History has shown that the cultures which are not respectful to nature do not last long- they bring about their own downfall. Heritage springs from human culture. This is part of human life, from which we learn who we are and how we live, and pass our values to the next generation. Though we have received so much from previous generations and civilizations, yet we act irresponsibly and neglect our heritage. People have become estranged from their natural surroundings and forgotten the time-honored ecological values of their culture. A warning is needed to human beings that environmental destruction cannot be continued if there is to be any hope for the future. All over India, there are local environmental projects and grass-root groups struggling against the tide of pollution and environmental destruction. The origin of the term 'forest sustainability' (Sinha,1991, p.12) at the transition of the 17th–18th century was concern about a threatening and existing wood emergency as a consequence of

excessive use leading to forest destruction. This was due to the rising standard of living and caused by the initiation of the industrial age.

Traditional views are very important for a calculated modern scientific development, for they remind us the negative side of certain achievements and give useful insight to create a balance between humans and nature. The main concept of *Vastu Shastra* is to explain how the human body is related to the building and to the universe, i.e. it establishes a relationship between humans and nature. Here, humans are the subject, object and the cause of *Vastu*. They perceive and conceive *Vastu* in relation to their experiences with the surrounding world. As tool-making animals, they design and control their environment. The sequence of the five natural elements is used as the mediums or the materials of the *Vastu*, known as earth, water, air, sun and space. *Vastu* goes beyond designing and architecture. At a higher level, it deals with the subtle effect of the design on the environment. The Vedic traditions of ancient India always held that the microcosm is a reflection of the macrocosm. A dwelling is an ecological unit, a microcosm that reflects the macrocosm. The modern mind identifies ecology with nature. For *Vastu Shastra*, the five primordial elements are the starting points for a design. The guidelines and rules of *Vastu Shastra* have been laid down clearly in several ancient texts, but the principles upon which they have been formulated are steeped deep in the Indian philosophy of Vedas. The importance of *Vastu Shastra* lies in understanding the basic principles as it analyses the blueprint which provides for a design system.

The term sustainable development and *Vastu Shastra* brings together two strands of thought about the management of human activities- one concentrating on

development goals, the other on controlling the harmful impacts of human activities on the environment (United Nations Centre For Human Settlements Habitat,1991). The fundamental nature of ecological planning is that the buildings and open space should adapt minimum disruption to the land-forms. The main concept of *Vastu Shastra* is to facilitate a harmonious relationship between human beings and the environment, which leads to sustainable development. The principles of *Vastu* should be brought together and coordinated through the process of management, if sustainability is to be achieved in all aspects of development. Management is the means for reconciling goals, priorities, resource allocations and the implementing methods, which should be contained in a comprehensive sustainable development programme. The role of *Vastu Shastra* in promoting sustainable development would include the following:

i. devising settlement systems and settlement plans that lead to resource-efficient and affordable transport patterns, e.g., by promoting short-distance and long-distance mobility;
ii. developing programmes for economizing on the use of non-renewable energy sources and for adapting settlements to the use of renewable energy systems;
iii. providing water-supply, sanitation and waste-processing and recycling systems, that meet basic needs in a resource-conserving manner;
iv. Promoting the use of indigenous building materials and appropriate construction technologies, inter alia, by revising building and planning codes supporting small-scale production processes.

In order to bring balance between human settlement and nature, *Vastu Shastra* contributes two central development goals – productive, innovative economies and

high-quality living environments, also providing an important mechanism for sustainably managing natural-resource use. It also includes support schemes to (a) conserve, recycle, re-use or reclaim materials or energy currently discarded or wasted, (b) identify and put into use unused or underutilized resources, (c) implement pollution-control measures and adjustments to pricing structures, so that these contribute to sustainability and to development goals, and (d) forge partnerships with low-income groups and their community organizations to address housing and environmental health problems. The role of *Vastu* in programming for promoting sustainability in natural-resource use must be based on a lifecycle approach to long-term productivity. Such an approach needs an appropriate legislative, regulatory and fiscal framework within which to encourage individuals, communities and businesses to contribute to meeting sustainable development goals.

Greatly improving the quality of life for the rapidly growing populations of developing countries cannot be achieved by following the same energy-consumption and resource-use patterns as those followed by developed countries. Each society must develop its own response to its ecological problems, and it is in this context that the role of democratic and participatory local governments and community organizations appears not only as a goal of sustainable development, but also as a critical means of attaining it. Sustainable development needs the contribution of local people, citizen groups, businesses and governments that can make realistic development plans, and the mobilization and the use of local resources, but it also needs managers and professionals trained to work within such a framework (United Nations Centre for Human Settlements Habitat,1991,p.43).

Changing work patterns, advancing telecommunication technologies and a dawning sense of ecological awareness offer the promise of a transformed habitat and the potential to humanize our relations in space. New management, communication and new patterns of *Vastu* living are converging to promote the productive home, where workshop and garden, community and production areas may be components in the design and grouping of homes. As such, *Vastu* -city-planning - should be to conserve transportation and avoid physical movement by communication, wherever possible. Decentralization of work centers, mixed land use and linear morphology of work centers with *chowks* and squares enhance socio-cultural richness and provide an even pattern of transportation (Padam, 1998,p.56).

Planning and development should be concentric and should provide a holistic perspective and engage attention on cross-cutting issues within the context of local communities and eco-systems. The fundamental premise of sustainable development in the Indian tradition is based on the process of self-help, public participation and arousing consciousness among the masses by spiritual, ritual and religious connotations. This facilitates a harmonious relationship between human beings and environment. Today, unless everyone is concerned about the environment, the government, centralized efforts and finance and legislation cannot be successful.

Vastu Shastra, or the Indian knowledge of architecture, is as old as the Vedas, which belong to the period 1500–1000 B.C. The study of *Vastu Shastra* in this paper has been concerned to reveal it not as an assembly of fragmentary pieces of knowledge, but as a coherent and complete program for architectural design. It is a corpus of knowledge that forms the blueprint, which has adapted itself to the regional, social

and political variations it has encountered in the past, and is the very basis of its continuation and contemporary use. This ancient knowledge (*Vastu Shastra*) has not been presented in terms and concepts familiar to the modern world. In order to evaluate the relevance of *Vastu Shastra* to the complicated problems of urbanization and overcrowded cities of the present world, we need to find out how the traditional knowledge of *Shastras* can be fruitfully used in our modern world. The main concern of this paper is to facilitate a harmonious relationship between humans, building and the environment, which leads to sustainable development. *Vastu Shastra* has become more relevant for modern humans because of the surrounding environment, which has gained importance due to pollution, climatic change, population pressures and overcrowded cities. In the 21st century, urban growth is one of the biggest challenges for humankind, so there is much discussion about the estimates of land consumption, the manageable size of mega-cities, and simple ways to structure, if not to control, this vast spread of urbanization. The essence of ecological planning is that the buildings and open space should adapt to the land-forms with minimum disruption. When looking at the damage that our cities and development have inflicted upon the environment, one of the prime points in the agenda is to explore the prospect of a living environment that is ecologically balanced and culturally stimulating. In view of the changing patterns of lifestyle and advanced technology, the issue is whether we can evolve a new set of rituals to preserve the urban environment. Sustainable development is mainly a concern of planning and designing with the environment. It means development and human intervention in the natural system to the extent of the carrying capacity of an area. The carrying capacity of a land/water area is the population or level of activity that can be sustained for a given length of time without depletion of resources or

breakdown of the biological/natural systems (Trivedi,2004, p.111). Therefore, *Vastu Shastra* as an applied knowledge is an important approach in establishing a balance between human-settlement development and natural-resource use, while ensuring that the use of natural resources and systems does not deplete the land's carrying capacity for the future generations. As a result, a society must not deplete natural resources or pollute the environment so as to irreparably harm future generation. It requires a livable built environment, which relates to the quality and nature of the built environment, including housing, roads, urban infrastructure and land use. *Vastu Shastra*, in the form of the planning of human settlements, has numerous important ancient Indian texts, which give a lot of information on principles governing building activity and on the use of rational materials. The appropriate knowledge of *Vastu* practice of architectural design and methodology has been sustained through thousands of years and is still applied in India explicitly and intentionally by architects, planners, NGOs and citizens. This validates the importance of *Vastu Shastra* in the present context of sustainability.

Vastu Shastra has evolved as a compilation of planning principles for a healthy living based on the knowledge base of the time (similar to Western treatises such as Vitruvius) and was not meant to be absolute. *Vastu* was earlier used in the design of homes, but became less prominent in the industrialization period during the colonial British time. However, it is used extensively in temple design, and so survived in the clans of temple designers and architects. In recent years, it has again gained mainstream popularity, and there are several *Vastu* consultants in India. The importance of five basic principles of *Vastu Shastra* has also been discussed. They are the doctrine of orientation, site planning (*Vastu Purusha Mandala*), the

proportionate measurement of building, the six canons of Vedic architecture and the aesthetics of the building. These principles were formulated thousands of years (approximately 5000 years) back by sages, and are still applicable because of their technical practice and ecological dimensions. It can be easily tuned, extended and modernized accordingly to meet the basic needs of human beings. In order to establish the relevance of *Vastu Shastra* as a science and to sustain parameters of judgment where in the ultimate analysis a thing that fits in with its functions is beautiful, whether it is a human being or a house, there arises the concept of the *Vastu-Purusha-Mandala* as ground plans and site plans. This provides templates that have the dual potential of interpretation of old monuments and conceptualization of new buildings. This epithet of ground plan blurs the difference in planning from one house to another, based on *Vastu Shastra* (which in reality may not be geometrically a perfect square grid), conjectured as based on *Vastu Shastra* because of its geometric similarity with the textual ground plan. The principles of the Mandala coexist with the other principles- of orientation, system of measurement, forms and so on – constituting the *Vastu Shastra* programme for architecture. *Vastu-Purusha-Mandala* as a central idea of a plan evolves to meet natural elements – such as light, water, wind, fire, biodiversity etc. While the terms light, air, ground, water and so on were intrinsic to the traditional programme of architecture, as they would be to any other programme concerning architecture, the perception and the architectural consequence of these terms was newly imported to echo the modern movement in the West (Ghadlali,1959, p.122). For example, the design of Chandigarh by Le Corbusier (a French architect) was welcomed by Jawaharlal Nehru as a creative approach in new terms of light, air, ground, water and human beings. The role of the architect continued by using the new perception to ‘study and understand the

tradition of the people within the region, to consider the local conditions and in some cases, to force certain changes in the life of the people by his knowledge of a healthy and refined life' (Curtis and Doshi, 1988, p.21).

The fundamentals of *Vastu Shastra* are based on low-cost architecture at a reduced environmental cost, with lowrise, high-density urban areas – for example in the state of Rajasthan – as a best way of using natural and local resources. Similarly, in the state of Kerala, everything is re-used and recycled. Leaves that fall from palm trees are used again for the roofs. This traditional knowledge is a magnificent approach to the modern world that shows us how to work with the environment, climate and materials that had long been available but unfortunately modern architects had forgotten and forsaken them. Hence, an old script of *Vastu Shastra* that we have today is the most wonderful traditional knowledge existing in the world, and with some modification it could exemplify all the concerns of humans today.

5.9. CONCLUSION

According to the Brundtland Commission 1987, Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The Commission's report also states that 'in essence, sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development; and institutional changes are all in harmony and enhance both current and future potential to meet human needs and aspirations'(Rangwala, 2011,p.181). The two main characteristics that define sustainable development are efficiency and equity: Efficiency, in functioning and equity, when distributed within the generation

and between generations. Applied to the context of urban planning and development, the most fundamental elements of sustainability are the utilization of natural resources in a city region most efficiently, most equitably across sections of society and in such a manner that the resources are conserved and renewed for future generations to meet their needs and aspirations.

The important dimensions of development are a steady improvement in the material as well as infrastructural circumstances of all citizens, towards greater health, comfort and leisure, with better economic, educational and vocational opportunities; a city that moves towards greater self-reliance and provides opportunities for its citizens to enhance their capability in securing development of themselves and their human settlements. Thus the parameters for sustainable development are fully in continuance to the principles of the traditional Indian *Vastu Shastra*.

In similar context the Ministry of Urban Development of India has launched the National Mission on Sustainable Habitat, in 2010, for the cause of sustainable settlement design and for the preservation of natural resources and also to promote energy efficient techniques. The parameters that constitutes sustainability, under this mission are divided into five core principles, namely, Development, Efficiency, Equity, Safety, Harmony; which directly utilizes the *Vastu Shastra* principles.

For the development of a city and its region to be sustainable, the resources available for development have to be utilized with the utmost efficiency to meet, first the needs and then the aspirations of those who live in the city region and depend on it for their livelihood. Land is the most finite resource available for development and

therefore its efficient use is fundamental to the efficiency of the human habitats at large. Efficient use of land has dimensions of putting land to the most suitable use based on its location, physical and ecological characteristics, conserving ecologically sensitive areas. It includes managing the nature and intensity of use keeping in mind aspects such as compactness, reducing travel demands, etc. The water balance in the city region is required to be understood and efficiently managed. Though the larger water cycle is primarily a natural process, human intervention cannot just minimize negative impacts on the water system; it can also have positive effects and even reverse the steady deterioration of water systems, which is the current status of most city regions. Efficient use of water resources involves optimizing the use of water and minimizing external energy inputs into the water management system. Cities are engines of growth and one of the consequences is that they are energy guzzlers. The planning, development and management of cities and their regions offers innumerable opportunities for reducing the consumption of energy as well as resorting to changing the source of energy that is consumed. Efficient use of energy in a city involves reducing the overall energy demand through increasing efficiency, promoting low energy options, etc and above all promoting the use of alternative sources of energy in both the public and private domain. The definition of sustainability requires that the distribution of resources to be equitable across sections of society at a given point in time as well as across the current and future generations. The latter case can be assured only through the efficient use of resources and limitation of aspirations of the current generation. The focus here, therefore, is on ensuring equity across sections of society today. Equitable development manifests primarily as inclusive development. The planning, development and management of cities and regions should be such as to include all

sections of society. Ensuring equitable development would focus on issues such as access to housing, health, transport and education facilities for all, especially the poor.

Urban development, by virtue of its very nature of concentrating human population and activity, creates risks for itself and the environment. These risks, when unmitigated, result in disasters involving significant loss to life and property, not to mention the environment. It is important therefore to integrate risk mitigation into all urban development practices. Ensuring safety in an urban area involves planning for urban development in low risk areas, developing norms to integrate measures to reduce vulnerability, creating mechanisms to absorb the impacts of disasters (financial), management of the law and order situation in a city, etc. Harmony is an element of sustainability that has not yet received its full due recognition. This includes harmony between manmade developments and the natural elements and more importantly harmony within the development fabric. Creating harmony in urban development ranges from issues pertaining to land use planning, development control regulations and building byelaws to create a coherent urban form, reducing pollution, etc.

Urban planning involves creating live able places in a city by managing competing interests for location and balancing social, economic and environmental changes. Urban planning practice operates at various levels of city activity, affecting almost everyone, involving policy-making and influencing decision-makers on matters ranging from physical and social infrastructure, employment, development, natural

resource management, maintaining the best of the past, while encouraging innovation in design and development of future spaces to meet future needs.

Architecture is a human act. It requires carving out a segment of that omnipotent, universal space of the *brahmanda*, the cosmic space, for the use of the human beings. It is not often that architecture truly rises to the challenges of capturing the divine character of the *brahmanda* in its folds. In the name of modernization, many a times we are inviting problems for our new generations like new diseases which reduce our body resistance power and increase tension, stress, fatigue etc. Thus *Vastu Shastra* may act as a bridge between man and the nature through certain logical and ethical principles, so that the basic elements are the environment are in harmony and thus in turn the ecological balance is retained.

The human race in the twenty-first century is encountering changes with tremendous speed. A number of opportunities as well as challenges are lying in the lap of the future and unless we gear up to face those challenges, in order to grab those opportunities and resources within a proper time frame, we are in for a massive adaptation breakdown. The social stresses which will be generated by the developmental forces might lead to the total collapse of human civilization and we will be doomed if don't prepare for them accordingly. Thus proper channelization of these forces and suitable adjustment in our values through the principles of *vastu shastra*, will make life much simpler, much more comfortable, and in turn thus leading a balanced ecosystem and a sustainable community.

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CHAPTER VI

THE CONCLUSION

6.1 ENVIRONMENTALISM: THE CAUSES AND ITS EFFECTS

Environmentalism is a broad philosophy, ideology and social movement regarding concerns for environmental protection and improvement of the health of the environment. The goal of environmentalism in simple terms is to keep pollution under control and protect plant and animal biodiversity. The origin of the environmental movement started from the response people had during the beginning of the industrial revolution to the levels of smoke pollution in industrial centres due to the burning of coal. People were noticing an immediate effect on their health, so making laws to clean the air quality was fairly easy.

Systematic movements to help the environmental only began late in the 19th century from the anemity movement, which was a reaction to industrialization, the growth of cities and worsening air and water pollution. The voices of John Ruskin, William Morris, George Bernard Shaw and Edward Carpenter were very influential in raising public awareness.

For most of the time 1850 to 1950, environmental issues were focused on cleaning up the air pollution in the heavy industrialized cities to make it safe for humans. But even that was not enough till the Great Smog of 1952 in London, where the city was brought to a standstill and thousands died due to the heavy smog, that a law was finally passed to prevent such heavy pollution from happening again.

In the United States, the most influential voices were those of Henry David Thoreau and John Muir in the late 19th century, both made philosophical contributions, but John Muir was the giant in the environmental and conservation front in the late 1800s and early 1900s. Books such as *Walden* by Henry David and *A Sand Country Almanac* by Aldo Leopold were benchmark works that awakened in many about what they were losing living in the big cities. During this time, a new technology called photography was becoming more widespread and so using photography to show pollution and destruction of land was critical in helping people understand how bad the conditions were.

The landmark book of the post World War-II era was *Silent Spring* by biologist Rachael Carson. The book exposed the agrichemical companies and showed how bad DDT was that was being used. The concern that was raised over what was brought up in the book eventually led to the formation of the Environmental Protection Agency. *Silent Spring* was the landmark book that raised mass awareness about DDT and the dangers of agrichemicals (Carson,1962, p.17). It was the forerunner to what current environmentalists understand and fight for and against.

The term ***Tree hugger*** is commonly used to refer to environmentalists, but the origin of the term came from the *Chipko* Movement (which was long before environmentalism), where they would literally hug trees and use their bodies as barriers to prevent the trees from being cut down. The women and men who formed the *Chipko* Movement, and began non-violent direct action to save forests, inspired modern day direct actions from various environmental groups. Mainstream

environmentalism led to signing of the *Endangered Species Act in 1973* which has been critical for figuring out how bad the ecological crisis is.

James Lovelock, with his GAIA hypothesis and Arne Naess with his coining of the term **Deep Ecology** created a division within the environmental movement. Later in 2001, *Deep Ecology: Living as if Nature Mattered* was published and it is the latest major work building on the Gaia theory and Deep Ecology.

In Mainstream environmental groups, they use only legal environmental and approved of methods to save the environment, such as petitioning and lobbying politicians, doing protests and so on. These methods have had varying levels of success. Recycling, using hybrid cars and more energy efficient products were being encouraged. They stress on the reduction of the carbon footprint as much as possible.

In **Radical environmentalism**, the groups do not stop at writing petitions and holding protests. They engage in direct action, beginning with tree sitting, blocking roads with their bodies, spiking trees and at the most radical, destroying buildings, dams and equipments. Basically it is active resistance against the system to protect the land-base and its animals. Some radical environmentalist, who of course are above ground and are writers, philosophers and scientist, except Paul Watson, are Derrick Jensen, Lierre Keith, John Zerzan, Guy McPherson, Daniel Quinn, and Capt.Paul Watson. Above ground radical environmental groups are Sea Shepherd, and Earth First. They all engage in and support direct action as well approved methods. Earth Liberation Front and Animal Liberation Front are below ground ad

often acting alone without coordinated plans. They have never killed anyone but are still labelled as eco-terrorists by FBI because they destroy buildings and man-made objects. We need both mainstream and radical environmentalism to be working together towards a common goal. Either one by itself alone is not effective.

6.2. THE NEED FOR ECO-SENSITIVE DEVELOPMENT

Suburb and edge-city developments all over the world and in India especially continues to erode forest and farms, disrupts hydrological patterns and weaken the overall ecological integrity of the region. Fragmented landscapes and equally fragmented communities isolate citizens from nature as well as from one another. Alternative approaches and models for creating sustainable communities are urgently required. Hence an attempt has been made to identify the evolving strategies and guidelines for development of such sustainable 'biotic' (Bookchin,1982,p.17) environments. A model sustainable edge community is analysed and it is being concluded with the assertion that sustainable development is attainable and improves community's civic sense and quality of life tremendously.

The biggest challenge facing humankind at the start of the 21st century is to reconcile the impact of humans with the ability of our planet earth to provide resources and absorb waste. Recognition of the vision for Sustainable communities is an important step towards the imperative of a sustainable country. This shall require macro and micro initiatives in partnership across all levels of the community from the highest levels of government to grassroots levels of the society. The imperatives will require some radical and some obvious paradigm shift demanding courage in politicians and legislators and understanding in society to assure the true

concept of sustainability, intergenerational responsibility which implies the provision for generations of today with a guarantee of resources and a healthy environment for generations of tomorrow. This would involve identifying tangible issues and ascertaining how sustainable developments would function. Some of the key issues are:

1. **Population:**

Stabilizing the population at a level that is aligned to the holding capacity of the space and natural resources available is required. The Utopian visions of **Garden City** and **Ecotopia** hold physical manifestations of a modern city that will enrich the human soul. As such, the developments of new paradigms for urban living need to embrace the processes of community participation that will engage people and establish ownership and commitment to sustainable lifestyles.

2. **Biodiversity:**

The natural environment is the source and the sink that sustains human settlements. Maintenance of biodiversity around and within the urban footprint of our cities is as important as maintaining a healthy natural environment in food producing regions, in catchments in forests and in wilderness areas. Pressures for development threaten to decimate vegetation and habitats to facilitate provision of access and services. These must be realistically balanced against the contribution healthy natural systems make to air and water quality, to mitigate the heat island effect of unrelenting urban hard surfaces and maintain the delight of trees, vegetation and wildlife in urban and suburban environments.

3. Public and Private Transport:

Underpinning almost every model of a modern sustainable city is an efficient and affordable transport system. Ina radical vision of sustainable edge city, public transport should be frequent, clean, efficient, safe, green and affordable. More dense suburban development should facilitate greater use of bicycles and encourage pedestrian walking.

4. Energy consumption:

Progression towards the vision of sustainable cities requires more radical commitment in this regard that will pursue solar, wind and other natural energy sources, and will also foster the concept of onsite energy harvesting and production thus reducing infrastructure required for distribution. A radical vision of a sustainable city may see photovoltaic arrays mounted on every roof.

5. Healthy buildings:

Buildings should be environmentally successful. Attention to good building envelope design and service systems that ensure good air replenishment. Environmental control need to be matched with attention to choice of materials sourced from healthy materials that avoid adverse off-gassing of harmful chemical substances, and thus to be humanistic communities (Norton, 1991,p.21).

Here, building materials play an important role in affecting the environment and consumption of energy. Hence the different types of building materials used since the ancient period shall be analysed in detail.

6. Wastewater:

Re-use of water, which is a common practice in many countries, will be an essential element in future for strategy for creating sustainable environment. In a context of national and regional water shortages and associated pressures on water infrastructure, it is irresponsible that often perfectly potable water is dumped into the municipal drains and arrives at overload effluent treatment facilities. Separation of grey-water from showers, hand basins and laundries, from black-toilet water is a priority that needs to be introduced in all settlements. Tanks for local treatment of grey-water can be accommodated in sub-floor areas. In contexts where water supply is a problem, composting toilets should be permitted. Composting toilet is the twin-pit pour flush system.

7. Security:

There is an absolute and direct link between security and sustainability. An insecure city is an unsustainable city. A secure city is not one with the surveillance camera only. At local level, crime is directly related to deprivation, poverty and inequity. At a global level, terrorism is related to anger and resentment related to inequity of lifestyles, intrusion into other people's resources and cultures and excessive plundering of the world's natural capital. The commitment to the quest for sustainable cities is fundamental and crucial to achieving both local and global security. It has also been recently demonstrated by a number of spectacular utility systems failures in large cities, that large centralized systems are much more vulnerable than local decentralized self-reliant systems.

6.3. AREA LEVEL STUDY FOR DEVELOPING SELF-SUSTAINING COMMUNITIES:

6.3.1. THE AREA:

Deepor Beel (*Beel* means wetland or large aquatic body in Assamese) located about 10 km southwest of Guwahati city is considered as one of the large and important riverine wetlands in the Brahmaputra valley of lower Assam, India. Deepor beel is spread over an area of 40.14 sq km during the monsoon (encroached/reclaimed/developed area of 30.8km), (Deka & Goswami,1992, p.12). The Beel is currently estimated to be 9.27 sq km. However the actual water body is 4.1 Sq Km. Depth of the Beel ranges about 6 m to 1.5 m depending on the monsoon or dry season. It is considered as one of the staging sites for migratory birds in India; and some of the large congregations of aquatic birds in Assam during winter. Because of the richness of avian fauna it enjoyed, Deepor Beel has been selected as one of the Important Bird Area (IBA) sites by Birdlife International. Deepor beel has also been designated as a Ramsar Site in November 2002.

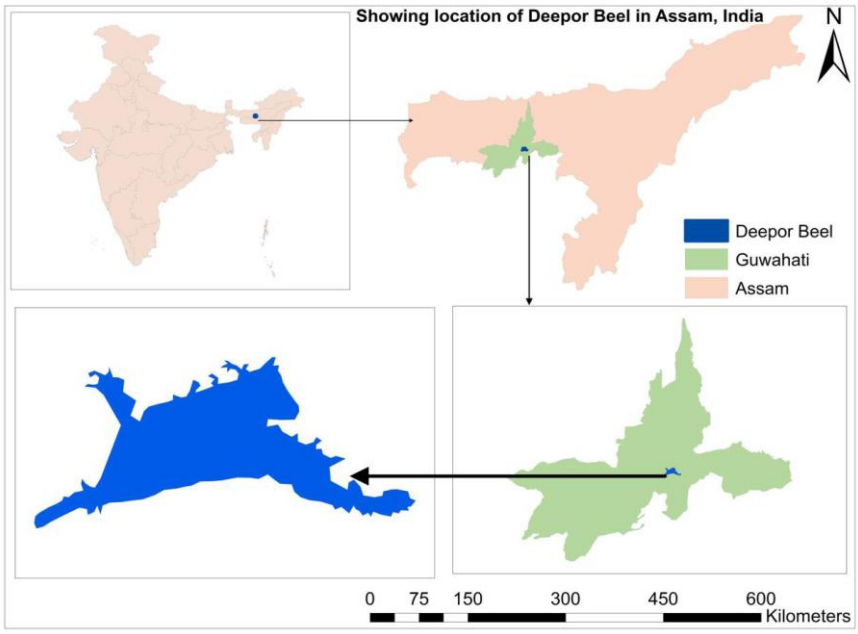


Figure-5: Location of Deepor Beel (Source: Prepared by the Author)

The Basistha and Kalmani rivers and local monsoon run-off are the main sources of water to the lake, between May and September. Khonajan channel drains the beel into the Brahmaputra River, 5 km to the north. It acts as a natural storm water reservoir during the monsoon season for the Guwahati city The beel has a perennial water spread area of about 10.1 km2, which extends up to 40.1 km2 during floods However, an area of 414 ha has been declared as **Deepor Beel Sanctuary** by the Government of Assam. As per a Remote Sensing Study the wetland area is reported to have reduced to 14.1% (405 ha) from 1990 to 2002.

6.3.2. ORIGIN AND TRANSFORMATION OF THE WETLAND DUE TO URBAN DEVELOPMENTS:

With urban development at its forefront, Deepor Beel has been facing threats for the water body and its biodiversity. Originally the Deepor beel had its natural linkage with the river Brahmaputra through the Borsola beel and the swampy areas of Pandu, lying to the Northeast. But with the construction of the NH-37, and other urban infrastructure works in the surrounding, this link has been shallowed down and cut off in some parts.

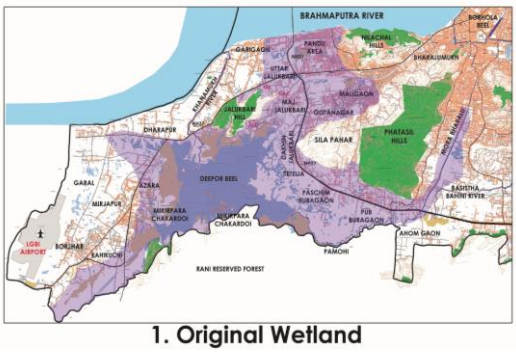
The major blunder in the development process of the city which affected the wetland the most, is the construction of the NF railway track across the Deepor Beel in 2001. The railway track divided the wetland into two parts, which further led to the dying up of one part of the Beel. As the part dried up, settlements gradually started to develop in the area. The settlements grew in size and other commercial activities also started to support the settlements. In the meanwhile, many factories and industries too developed their base in the surroundings and disposed their garbage

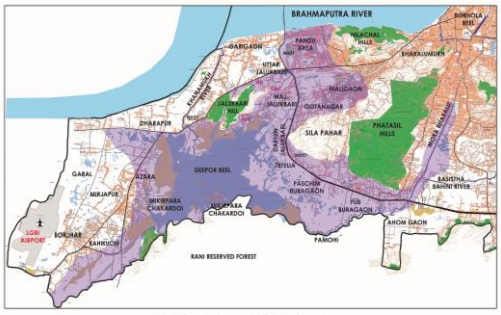
and wastes into the Beel. These activities began to pollute the wetland and threatened it biodiversity. Recent establishment of the City garbage center at the heart of eastern boundary at the Boragoan area is leading to heavy pollution of the deepor beel water and spreading water borne contagious diseases and disease vectors.

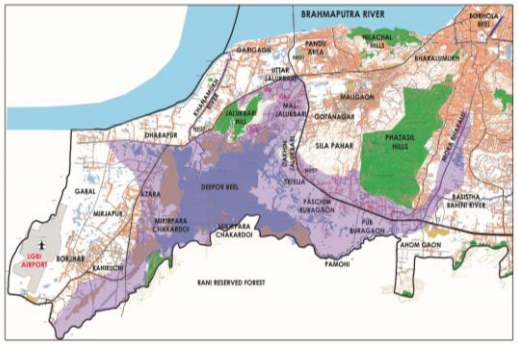
The NF railway also was constructed hampering the natural Elephant corridor which was existent near the Rani-Garbhanga Reserve forest. The first consequence of this action was that many Elephants (*Elephas maximus*), which is an endangered species, had died in the railway crossing while reducing the elephant population.

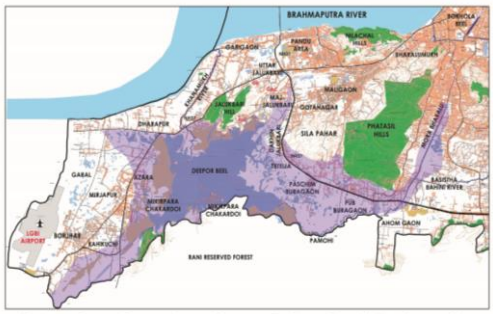
The second consequence is that the wild elephants come out from the forest to the surrounding villages which were once their house, and destroy the agricultural fields and any type of cultivation along with the settlements. Thus the surrounding settlements could never think of any type of cultivation and hence the surrounding fertile lands lay barren. These cultivable fields lay barren since more than 10 years and thus the land use is getting transformed from agricultural land to institutional land. Taking the advantage of this transformation, many other agencies are also filling up parts of the wetland for different types of construction such as residential, commercial, and institutional as well as some government buildings.

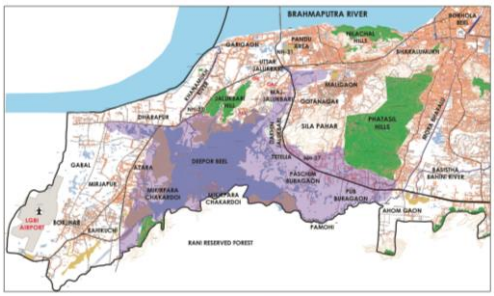
The following images explain the transformation in size and pattern of the wetland in different stages:

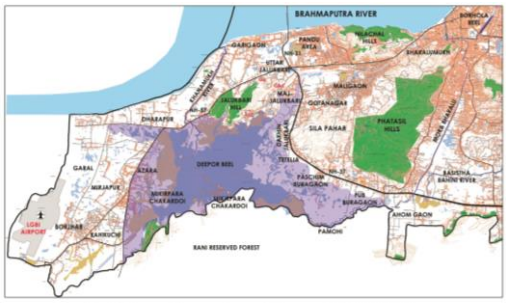


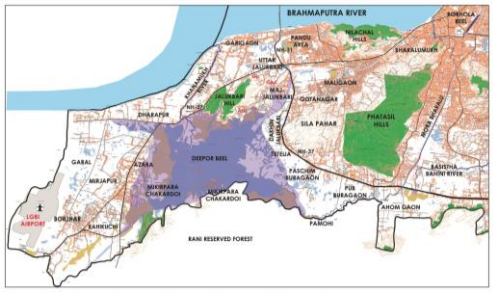












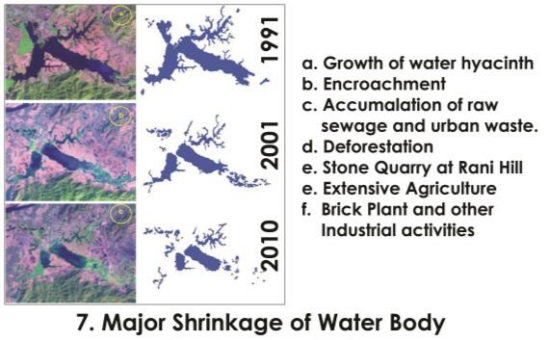


Figure-6: Transformation of the Deepor Beel and shrinkage of the area of the wetland (Source: GMDA Master Plan Report, 2015)

6.3.3 . ZONAL ANALYSIS SHOWING THE MOST AFFECTED AREAS:

With urban development at its forefront, Deepor Beel has been facing threats for the natural waterbody and its biodiversity which in turn affects the whole city.

In this paper, the areas in and around the Ramsar site which are most affected due to different types of urban development shall be analysed in detail. The areas which have been highly transformed are as follows:

i. Zone-A: Kalmani creek beside the National Highway
ii. Zone-B: Dharapur
iii. Zone-C: Maligaon-Azara Railway track

The details of the zones are discussed below.

6.3.3.1. Zone-A: Kalmani creek beside the National Highway

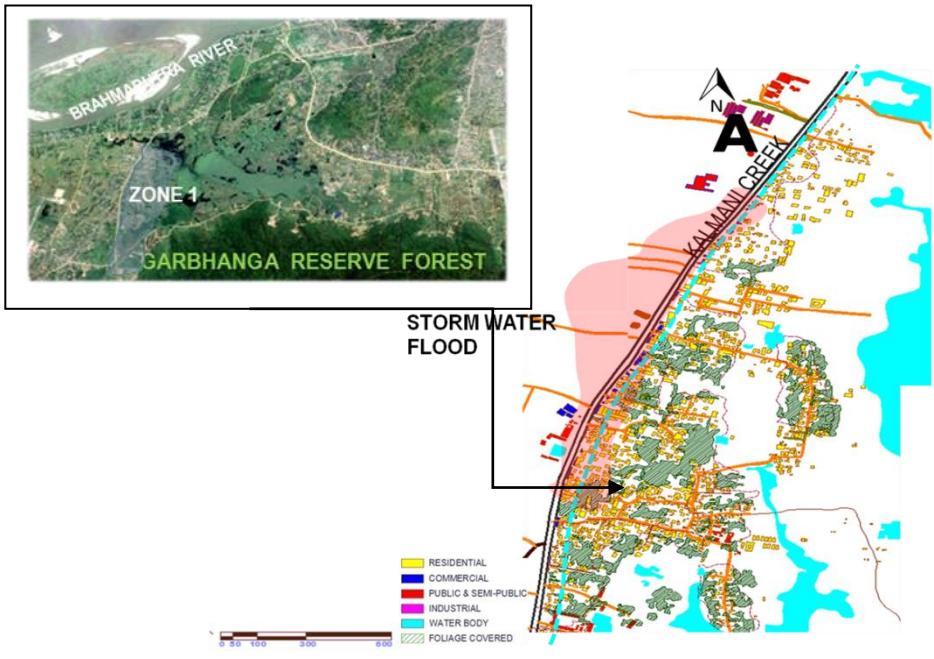


Figure 7: The plan showing the location and flow of the Kalmani creek which was there earlier before the construction of the Highway. (Source: Prepared by the Author)

As depicted n plan in dotted lines, the Kalmani creek existed in the location where the NH-37 now has been constructed. The Kalmani creek acted as a storm water channel connecting the city to the Deepor Beel. But with the expansion of the movement networks which further helped in the growth of settlements almost filled up the creek making the river-bed very shallow and thus leading it into a dead river gradually. The links to the catchment areas has been filled up and the creek remain just as dumping yard or has been converted into service lanes in some other parts. Due to this the storm water could not flow to the Beel, for which there has been problems of artificial water-logging in different parts of the city.

6.3.3.2. Zone-B: Dharapur

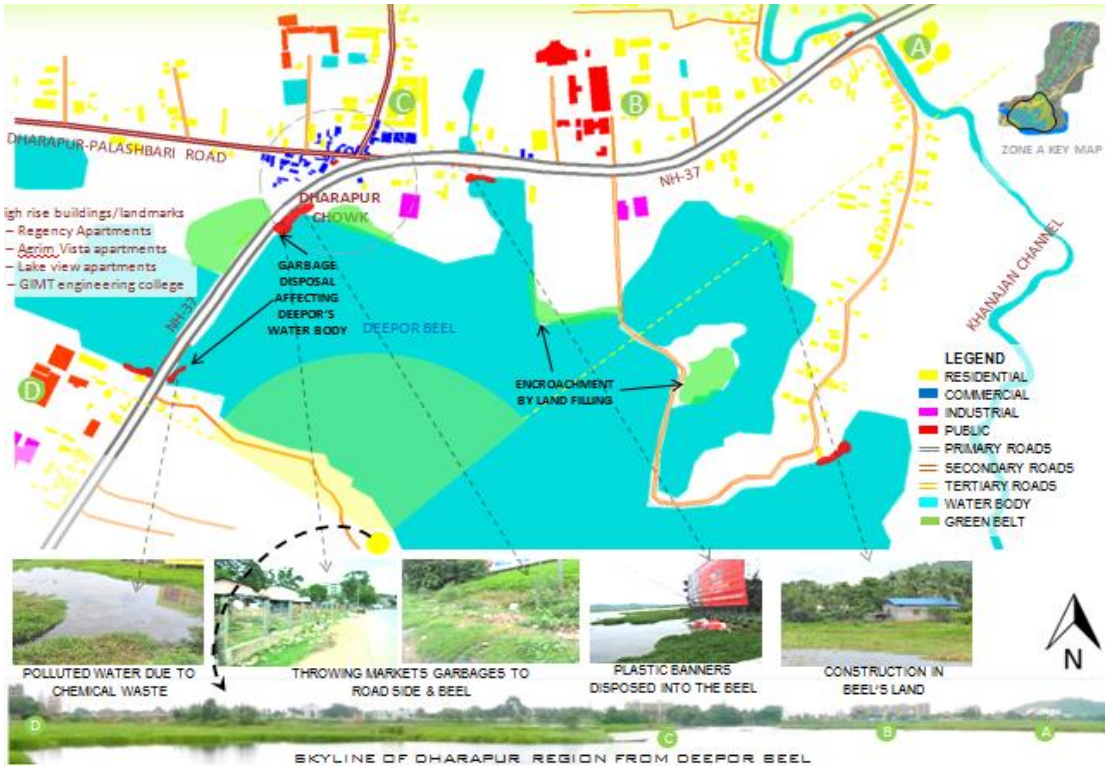


Figure 8: The Dharapur market area along the movement network which has converted part of the Beel into dumping yard. (Source: Prepared by the Author)

Large-scale encroachment of the government and as well as private owned low lying area of the deepor beel Ramsar site for settlements, institutions, and business shops, causes tremendous threats to the wetland ecosystem in immediate future.

Recent establishment of the City garbage center at the heart of eastern boundary at the Boragoan is leading to heavy pollution of the deepor beel water and spreading water borne contagious diseases and disease vectors.

6.3.3.3. Zone-C: Maligaon-Azara Railway track

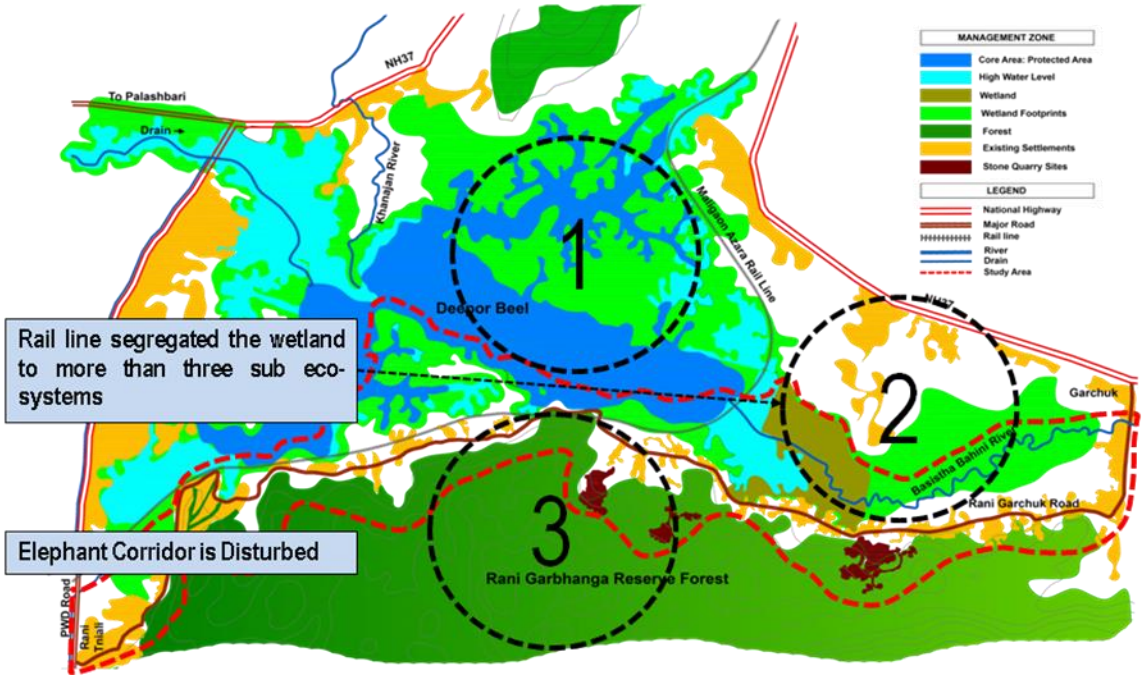


Figure 9: The Railway track dividing the wetland into two segments

(Source: Prepared by the Author)

The Maliagon-Azara Rail line segregated the wetland to more than three subsystems. The railroad is hampering in wetland-animal (specifically wild Asiatic elephants) interactions. Wild elephant has regularly visited the Deepor beel ramsar site to forage on aquatic vegetation. But this frequency has been reduced alarmingly due to

existing rail road. Moreover, the elephant and their cubs could not be move easily and safely due to frequent running of passenger and goods train.

Stone quarries have come up in this site which not only damages the large natural wetlands, which are of great biological importance, but also harms the environment of the city.

As the settlements drain their sewage effluents into the lake this results in harmful contamination of the water, affecting the lake's aquatic eco-system. Unplanned hill cutting and rarely regulated logging leads to heavy soil erosion which in turn causes rapid siltation in the wetland. Loss of trees also leads to habitat loss. The cutting of timber in Rani and Garbhanga forests have affected the Asiatic elephant population to a great extent in terms of food and habitat and also leads to man-animal conflicts.

6.3.4. MORPHOLOGICAL TRANSFORMATION OF THE DEEPOR BEEL:

Large-scale encroachment, heavy siltation from the denuded hills surrounding the beel, accumulation of all sorts of filth and wastes from the Bharalu and Bahini rivers, unregulated fishing practices, invasion of aquatic weeds, industrial development within periphery, construction of railway lines, quarrying within the beel ecosystem, etc., have pushed this once-pristine ecosystem to the brink of disappearance.

There is an urgent need therefore for the State Government to stop the steady encroachment by settlements and industries into the wetland by enforcing the provisions of the newly enacted Guwahati Water-bodies (Preservation and Conservation) Act, 2008 and prevent the contamination from agricultural and industrial wastes, as well as create a proper management system to regulate human activities in the wetland.While this wetland is to be protected strictly from the environmental perspective, it can also be developed and promoted as fisheries and tourist attraction, providing gainful employment avenues to thousands after the water quality of the Beel is restored. It is time that the state government gives a serious thought to securing the health and well-being of the Beel.

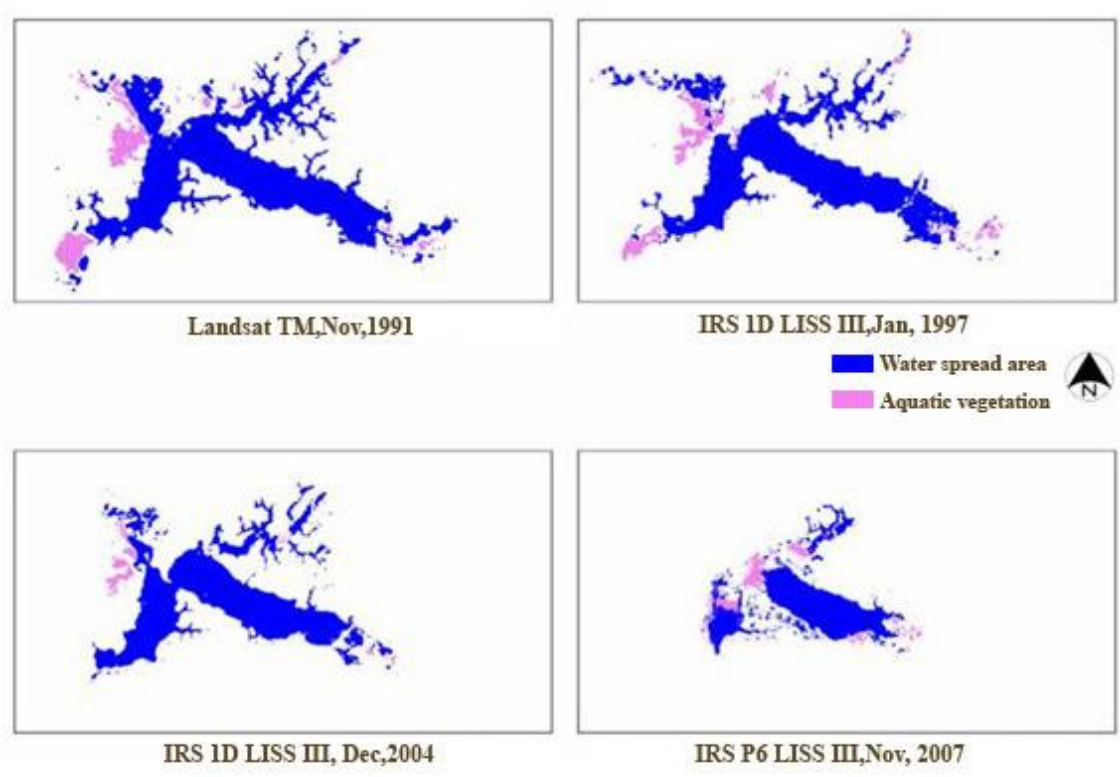


Figure 10: Satellite images showing the shrinkage of the Deepor Beel happening in an alarming rate.

6.3.5. THE NEED FOR CONSERVING THE WETLAND:

Deepor Beel is Assam's lone Ramsar site, one of the largest wetlands of the Brahmaputra valley and the only major storage water basin for Guwahati's drainage. Till 2009, the beel was maintained by the State Fisheries Department. Then the state government declared the beel a bird sanctuary for the numerous migratory birds that visit annually and banned fishing. And just like that, the fishermen's lives went for a toss. Sadly, while fishing is banned to protect the wetland, oil refinery, domestic and hospital waste is still being dumped, choking the wetland, killing fish and spoiling the very beel. Deepor Beel is a source of water for the number of wild animals from the adjoining Rani and Garbhanga Reserved Forests, including the noteworthy Asiatic elephants. In addition, the area provides essentially the only major stormwater storage basin for the city of Guwahati. Sustainable development of Deepor is important not only for the wetland itself, but for greater good of the rest of the wetlands in Assam and India. In addition, Deepor Beel conservation can serve as a model for other wetlands in the region and ensure their sustainable management.

The threats to Deepor Beel are typical of wetlands in this region and other developing countries. It is purposed that the following three major anthropogenic threats receive immediate attention:

- Municipal garbage dumping in the wetland by Guwahati Municipal Corporation
- Illegal land use and settlement in and around the wetland
- Lack of a comprehensive management policy with adequate institutional arrangement

- Industrial development within the periphery of the Beel.
- Brick manufacturing and soil cutting within the Beel ecosystem.
- Hunting, trapping and killing of wild birds and mammals within and in the adjoining areas of Deepor Beel.
- Spread of invasive species and associated problems
- Unplanned and non-regulated fishing practices

6.4. REGULATIONS AND GUIDELINES TO BE IMPLEMENTED:

Rapid urban expansion and overexploitation are among the well documented threats to the biodiversity and ecological integrity of the wetland. In order to prevent further deterioration of the waterbody, regulations should be imbibed upon the users as well as the surrounding developments should be controlled. The regulations should include protection measures of the Deepor Beel, control of unregulated infrastructure around the Beel, conserve the traditional architectural patterns around the Beel, and support tourism activities to generate revenue and also to develop guidelines for the future developments. The solid waste management system also needs to be taken care of to maintain hygienic conditions in and around the waterbody. A State level wetland regulatory board should also be created to regulate developments around the wetlands and to develop strategies to encourage the traditional livelihoods development schemes and programmes to make the areas sustainable and thus to save further degradation of the natural systems.

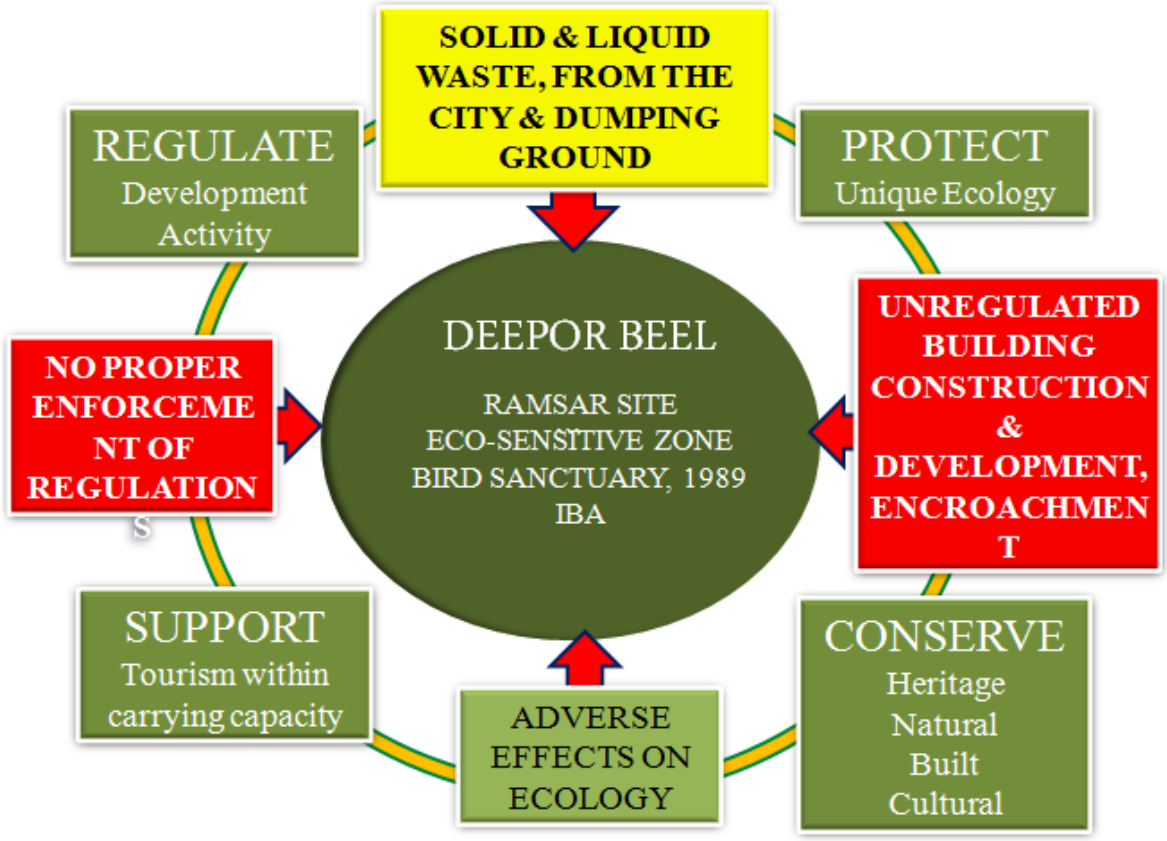


Figure 11: Regulatory measures to be adopted to save the wetland (Source: Prepared by the Author)

6.5. CONSTRUCTION MATERIALS FOR DEVELOPMENT OF STABLE ECO-COMMUNITIES:

Man's basic needs, after food and clothing has always been protection from weather, from heat of the sun, from torrential rains and from cold. The very first time man realized the concept of building when assembled near the fire and have hidden themselves in between the stones, protecting from cold. This has awakened the idea of using stones as a protection from the rough weather. It was copper age and the

steel was unknown so there were no chisel and hammer. Stones were used for making the tools. Thus the stone caves were constructed for shelters. Later attempts were made to provide these shelters in the form of screens and windbreaks of interwoven branches and walls piled one upon the other. He slowly acquired knowledge of the elementary principles of building and how to stabilize the structure. The basic raw materials then were stones and clay. Clay structures produced erosion in heavy rain, and cracked in hot weather. These were stabilized by the addition of different organic and inorganic materials. Organic materials used were natural products mostly agro-products, and the inorganic materials were lime and other pozzolanic materials such as surkhi, rakhi etc. The durability was further improved by mixing aggregates like sand and stones. Through the ages man searched continuously for new and better material with which to build and decorate the structures and these new materials often demanded new techniques of application. The ancient builders were very well versed with the knowledge and technique of construction. Some of the structures are still standing in acceptable shape today and speaks about their durability and foresightedness of the artisans' selection and use of materials as well as their architectural skill.

6.5.1. Building Materials for sustainable communities:

This analysis depicts the materials, methods and application technique and the process of their interaction. This shall also include the natural polymers, which were frequently used in the ancient period and are the key source for durability enhancement of the buildings.

6.5.1.1. Binders:

For joining the stones and bricks in buildings, some mortars are used and at times the walls are plastered. Plasters, mortars and concrete constitute chiefly of binder, aggregates and water. Binders are the materials which cement the aggregates together. The quality of plaster, mortar and concrete is controlled by the type and quality of the binder, aggregates and the method used to produce it. Different types of binders are used for making plasters, mortars and concrete such as clay, gypsum and cements. Modern concrete is made with Portland cement s binder and the industrial by-products like flyash, condensed silica fume, and blast furnace slag as the pozzolanic material.

a. Clay:

Clay is one of the most widespread and earliest mineral substance utilized by man in construction. The properties of clay allow to put them in different types like kaolinite clays, ball clays, montmorillonite clays etc. Durability and strength is provided to clay through chemical stabilization. The stabilization is done by treating the soils mechanically, chemically or chemically aided by mechanical treatment. These provide better workability, plasticity and will produce well compacted soil which will be dense and less permeable. Consequently this will produce mass of stronger mechanical strength and better durability.

b. Lime:

Lime and lime products have been used from a very early period in the history of civilisation. The earliest traces of the use of lime in construction are of lime plaster and stucco in India and in early Egyptian buildings. A lime gypsum plaster was used

at times in the masonry to fill joints and level up hollows. Burnt lime worked as binder where as unburnt lime worked as fine filler.

c. Pozzolanic Materials:

Pozzolanas are the materials without hydraulic properties but are capable of hardening as a consequence of their reaction with calcium hydroxide and water. They comprise of both natural materials, which have been used for thousand of yeas and artificial materials, such as flyashes, silica fume, metallic slag, burnt clay etc. Reviving the use of these materials in a way will help in maintaining the old tradition and the technique of it use known by the ancient builders will not vanish. It shall help a lot in the restoration and conservation work to reproduce the repair materials of the same or similar quality.

d. Gypsum:

Gypsum is a mineral and rock. It is used as set retarder in Portland cement manufacturing process. Gypsum was used both as a mortar for joining the blocks and as a plaster already at the beginning of the third millennium B.C. in ancient periods in India, Mesopotamia etc. By the second half of the 18th century, it came to be more generally used for wall and ceiling plasterwork, and various patented varieties were introduced.

e. Cement:

There are natural and artificial cements. The natural cements are actually lime-pozzolanic materials or made with ground mountain rocks and caustic alkalis. The first ones were known as ‘Roman cement’ and the second ones are known as Soil

cement. Until the middle of 19th century the term ‘cement’ generally was referred to ‘Roman Cement’ (produced by calcinating the nodules or argillaceous limestone at 800 degree celcius). After that the term ‘cement’ has commonly been understood to mean ‘Portland cement’. Portland cement inspite of attaining early high strength are not durable in the long term. Whereas the concrete made by lime base binder are slow hardening but have more elasticity.

6.5.1.2. Stones:

The Indian sub-continent’s architecture is well documented by stone which covers a period of more than 5000 years. The oldest evidence has been recorded in the Indus alley Civilisation. Different types of stones were used in the ancient period for making sculptures ad as blocks for making buildings. The Indus alley Civilisation shows the use of tertiary limestones, sandstones and Mesozoic steatite for stone statuary. Similarly in some part of far south, sculptures made from such hard rocks as the charnockites are found. Basalt in stone art is seen in Bihar and Bengal during 700-1200 A. Rock cut architecture made its beginning in the 3rd century B.C. and reached its acme in the basalt country of Ajanta in 6th century A.D.

6.5.1.3. Bricks:

Bricks for building construction were of two types. The earliest use of the molded bricks was after baking them in the sun. Later, the technique was developed to burn them at high temperature. The earliest use of sunbaken bricks found is at Dholavira in 3000 B.C., which has emerged as a major Harappan city, remarkable for its exquisite planning, monumental structures, aesthetic architecture an wonderful water

management system. Mud bricks were also used in the construction of Indraprastha, a village in Mahabharata.

6.5.1.4. Natural Polymers:

Natural polymers are the organic materials found in nature. These are mostly natural and agricultural products, having natural balance. This makes them stable in a very wide range of atmospheric conditions, whereas synthetic polymers are man-made in factories and are stable only in specified conditions. Some other products have also been used like milk products, sugar compounds, oils, eggs etc. All these products contain various proteins, cellulose, polysaccharides and fat. These work as air entraining agent, produce viscous mass, increase adhesiveness and increase resistance against water penetration. It is to be noticed that the ancient builders did not use one single polymer but always two or more have been used together. These compensate the negative properties of each other.

6.5.1.5. Limewashes:

Limewashes have been in use from the time immemorial. Basically, it was done because of the aesthetic reasons, but there is a solid scientific reason behind it. According to old tradition, the white washing was one after the monsoon period. During monsoon, humidity and temperature increases which give birth to a lot of bacteria and insects. Apart from this, high humidity and temperature also influence the plasters on the walls and ceiling. This decreases the strength and life of the dwellings. Cleaning and white washing strengthens the structure and being antiseptic kills the bacteria and insects and thus promotes hygienic atmosphere.

6.5.1.6. Plasters:

Plaster consists of binder which can be clay, lime or cement and aggregates, which is generally sand. It strengthens the wall and thereby prolongs its life length. Various types of plasters have been developed and used in different periods. Composition of some of the plasters from different period differed from each other not only in the ingredients content like mud, lime, pozzolanic materials but also in the type and amount of organic materials and natural polymers. Preparation of plaster, which is done by mixing aided by beating and the technique of its application is very important from the durability aspect. Apart from the technique for use of plasters, significant role is played in selecting the composition of plaster with gradual grade variation from coarse to fine, which is done in different stages. It provides a systematic distribution of pores, which allows good moisture transport and drying facility. This minimizes the damages caused by fast and inhomogeneous drying and increases the durability. Modern plasters on the other hand, miss the beating part whilst mixing and are not comparable in quality to the ancient plasters.

6.5.1.7. Mortar:

Ancient mortars were rich in binder and were porous. Lime used was frequently under-slaked and was made from limestone with clay impurities. Fat lime was not preferred owing to its inability to provide strength without carbonation which takes very long time. Generally hydraulic lime or lime-pozzolana was used as binder. Sumptuous amount of aggregates was used in making the mortars. The properties of mortars therefore very much depend upon the quality of aggregates and the bond of the binder to the aggregate.

It is indeed very interesting to note that in ancient period the builders were very much foresighted and have used the material and methods, which will not create the problems at the later stage, but would rather help in maintaining the natural balance. This type of building materials retain its use in today's settlements, shall serve as the base for revival of the ancient techniques and materials, which were successfully used with profound durability. Most of the materials used were natural, locally available materials and had no adverse effect on the health of the builders. Thus this will help in solving the ecological problem in an environmental friendly way.

6.6. BEEL-CONSERVATION FOR A SELF-SUSTAINING ECO-COMMUNITY:

Sustainable development concerns in the sense of enhancement of human well-being broadly conceived are a recurring theme in India’s development philosophy. The present day consensus reflects three foundational aspirations. First the human beings should be able to enjoy a decent quality of life; second, that humanity should become capable of respecting the finiteness of the biosphere; and third, that neither the aspiration for the good life, nor the recognition of biophysical limits should preclude the search for greater justice in the world. Sustainable habitat would mean achieving a balance between the economic and social development of human habitats together with the protection of the environment, equity in employment, shelter, basic services, social infrastructure and transportation.

To achieve sustainability in the long run, the boundaries of Deepor beel should be so defined that it encompasses not only the water spread areas but also the buffer zones and possible future annexations. The area included within Engineering College Road

and National Highway 37 (North), Gorchuk-Rani Road (South), National Highway 37 (East), and National Highway 37 and Rani Road (West) should be declared as Deepor beel System. Rani-Garbhanga forests and new Deepor Beel system should be declared as environmentally important area (Deepor beel Environmental Park). However, many of the buffer zone area within the proposed boundaries have already been developed for industries, business, and residential buildings. While it will be irrational to give up on those, it is impractical to assume that the people and businesses can be evicted and rehabilitated easily. The most practical way that will make sense and can be implemented would be to come up with strict environmental regulations for those who already have legal establishment in the peripheral areas.

A few strategies and initiatives that can be taken for the conservation of the wetland and thus to create a self-sustaining habitat around the wetland system, are explained as below.

6.6.1. Creating a Buffer Zone around the Wetland:

It is vital include incorporate buffer zones within the Deepor Beel Ramsar site. The inclusion of buffer zones will help to support the nesting and roosting habitats of most of the residential and migratory waterfowl as well as small and large mammals. The Plantation Program should be started in highland within the Ramsar site to create breeding ground of residential waterfowl.

The effectiveness of the Deepor Beel system as a storm water detention basin for Guwahati city should be preserved and the increasing pressure of storm runoff from the city to the wetland should be reduced through creation of additional storage

capacity in the naturally depressed areas within the greater metropolitan area of Guwahati. The missing links of the Beel with other natural channels which help in the storm water flow has to be connected.

6.6.2. Diversion of transportation systems along the periphery and environmental sustainability:

The existing rail road through the southern periphery of the Deepor beel separates the wetland into at least three subsystems and, thus, the continuity of the system is lost. Further, the rail road segregates the wetland-forest ecosystem and is a major threat to the ecosystem particularly in terms of encroachments, forest destruction, soil erosion and ecological disturbances. Fragmentation of a wetland is known to have negative impacts on many bird species. The best alternative for the health of the wetland and Rani-Garbhanga Reserved Forests is to rehabilitate railroad on the Northern part of the wetland or along National Highway 37.

Till such a massive project can be undertaken, the following measures should be initiated:

(1) halting of trains and blowing of horn should be avoided within the boundary of Deepor beel,

(2) rail traffic during dusk to dawn should be avoided to make it easier for the land animals to cross over to the wetland for water and food,

(3) to keep the noise level down, suitable plantations should be raised on either side of the rail road.

6.6.3. Land ownership and Social sustainability:

Any form of land transaction or sale and land transformation should not be allowed within the Deepor Beel even if it is a private owned land. The private owned land should be purchased by the government or Deepor beel Development Authority as soon as possible.

As concluded by Murray Bookchin, Social Ecologists have organized community land trusts where local people buy and then manage land and businesses for the good of the entire community. The eventual goal of these economic praxis strategies is not only freedom from the dominant economic system but the development of a consciousness of community citizenship and mutual obligation. This municipalisation of the local economy is seen as a means to politicize the economic realm and dissolve it into the civic domain. Similarly, Ebenezer Howard's 'Garden Cities' were also built on land acquired and owned by a common trust instead of individuals.

Social sustainability is the ability of a community to develop processes and structures which not only meet the needs of its current members but also support the ability of future generations to maintain healthy communities. To achieve social sustainability, the culture and values of the region has to be preserved, as suggested by William Morris. Morris' idea of recreating the local crafts with local labour helps to preserve the art form as well as dignifies the artisans. This also allows use of local materials which in turn is cost-effective as well as encourages the native crafts to sustain. This helps to integrate the society for the well being of the whole community and work for the preservation of the arts and crafts.

6.6.4. Recycling and economic sustainability:

Planning and development should provide a holistic perspective and engage attention on cross-cutting issues within the context of local communities and eco-systems. The fundamental premise of sustainable development in the Indian tradition is based on the process of self-help, public participation and arousing consciousness among the masses by spiritual, ritual and religious connotations. We must demonstrate the technical feasibility of solar, wind and geothermal-energy technologies, introduce new preventive and control techniques and adopt higher energy-efficient standards for everything- from automobiles to household appliances.

With respect to Deepor Beel, the water-hyacinth growing the water body can be used for production of crafts and other products, which would create economic sustainability within the community, as well as help restore the water ecosystem.

6.6.5. Rani-Garbhanga restoration and forest sustainability:

Further destruction of adjoining forests should not be allowed and eco-restoration should be initiated immediately. Rani-Garbhanga Reserved Forests should be included as part of the Deepor Beel Environmental Park and protected under appropriate regulations.

The fundamental nature of ecological planning and restoration is that the buildings and open space should adapt minimum disruption to the land-forms. The is similar to the main concept of *Vastu Shastra*, which is to facilitate a harmonious relationship between human beings and the environment, which leads to sustainable

development. The principles of *Vastu* should be brought together and coordinated through the process of management, if sustainability is to be achieved in all aspects of development. Management is the means for reconciling goals, priorities, resource allocations and the implementing methods, which should be contained in a comprehensive sustainable development programme.

The role of *Vastu* in programming for promoting sustainability in natural-resource use must be based on a life-cycle approach to long-term productivity. Such an approach needs an appropriate legislative, regulatory and fiscal framework within which to encourage individuals, communities and businesses to contribute to meeting sustainable development goals. The development of simple, small eco-technologies with bio-architecture, which use replenishable fuels and adopt recycling, provides environmentally sustainable and economical alternatives to the present energy crisis and the pollution caused by it.

6.7. TRADITIONAL TECHNIQUES FOR WATER HARVESTING:

With growing scarcity of water and deteriorating quality, water resources management in India is becoming more challenging with the passage of time. Preservation maximizes the use of existing materials and infrastructure, reduces waste, and preserves the historic character of older towns and cities. In order to design sustainable towns and cities, sustainable practices should be implemented in sensitive zones like hilly areas, eco-zones, biodiversity areas and also in any other urban and suburban area. Such sustainable practices can be derived from traditional knowledge of our ancient civilizations which are much logical and environment-

friendly with simple technology and are also easy to maintain. These types of practices can be revived with the help of modern technology or can be used just like the ancients did, in order to meet the present needs and also to preserve the resources for the future. Only such developments can be termed as purely smart designs, which respect the prevailing cultural traditions, and also help in restoring the surrounding environment and existing resources. This also includes the linkages to existing wetlands and other water bodies and thus maintains the natural balance of the ecosystem in order to get a self-sustaining community.

Water has been harvested in India since antiquity, with our ancestors perfecting the art of water management. Many water harvesting structures and conveyance systems specific to the eco-regions and culture has been developed, such as the **Drip-Irrigation** system of Meghalaya, the **Warka Water towers** of Ethiopia etc. as required in that region. This timeless and traditional technology uses locally available material while harnessing the forces of gravity. The northeast region of India is characterized with excessive rainfall and high floods during monsoon. Shifting cultivation, cultivation into marginal slopes, cutting and filling of slopes, deforestation, improper construction activities, massive soil erosion, pollution of agricultural land, improper irrigation facilities and improper drainage, all these causes damage to the biodiversity in the region. No design can be considered as smart design if it does not consider the local elements and preserve the ecological balance of the area. Hence measures should be taken to preserve the biodiversity of the area and that can be possible through the use of local materials and traditional techniques, since the traditional technology had been derived keeping in mind the

requirements of the area and the ecological balance. These traditional systems do not require any fuel or power and one can consider implementing it in regions where bamboo is available for free or at a low cost. The water resource is the most important issue now-a-days. The country is divided into both hydro-rich and poor regime, and in both cases local technology is maintaining the water stress. Development strategies point out that traditional water harvesting will give a boost to empowerment of the local people, local traditions and local economy and thus speed up development in all respective manifestations of rural and suburban areas. This in turn will help to control the urban sprawl, which again will result in the progress of urban areas.

6.8. CONCLUSION:

Environmental ethics has to be directed to human dominated, managed, disturbed (and often degraded) landscapes, Such a land ethic must be informed about ecosystem health, but more focused on human ecology, on political ecology. Government and business are large influences in our lives; both have vast amounts of power to affect the environment for good or ill. Social systems make humans behave as they do toward their environment, and any effective reformation will have to be worked out in reformed, more environmentally sensitive social institutions. Environmental ethics cannot be an ecosystem ethic pure and simple; there is only an ethic about humans relating to their ecosystems, in the economies in which they live.

Environmental ethics must be corporate; action must be taken in concert: green politics, green business, the natural environment is crucially a commons, a public

good. Policies will need to relate such a commons to capitalism, ownership of the means of production, market forces, the concerns of labour, real estate development policies, property rights of individuals, population control, and equitable distribution of the products made from natural resources. There is no invisible hand that guarantees an optimal harmony between a people and their landscape, or that the right things are done in encounter with fauna, flora, species, ecosystems, or regarding future generations.

Humans are mostly moved to act in their self-interest; and they will do so to the degradation of the environment- unless environmental policy gives them incentive otherwise. Short-term self-interest will get out of hand, especially when coupled with social power. Thus, to respect ecosystems and keep them healthy, to ensure environmental quality even in a humanistic ethics, there is a need for laws to regulate private and business use; these regulations are imposed in the longer-range public interest by the forces of democracy.

Bioregionalism emphasizes living on regional landscapes. The most workable ethic is where persons identify with their geography. People are likely to be most motivated by what they have at stake on their at-home landscapes. What is politically possible is concern about the countryside of everyday experience. After all, ecology is about living at home (Greek: oikos, 'house'). That is where the land ethic really operates. That is where people can act, where they vote and pay taxes. They need to be 'natives', as much as 'citizens', (Serres,1995,p.5) argues that 'the old social contract ought to be joined by a natural contract'. The United Nations World Commission on Environment and Development declares: 'Sustainable development

is development that meets the needs of the present without compromising the ability of future generations to meet their own needs'. That applies to agriculture, forestry, water use, pollution levels, industry, resource extraction, urbanization, national policies and strategies. All these combined brings the idea of stable state and a socialist system of the society to be self-sustaining and less consuming.

A century ago, a call for community was typically phrased as the brotherhood of man and the fatherhood of God. For most of the twentieth century the call was phrased as justice and human rights. In this century such a call must be more ecological and less paternalistic, less humanistic and more global. We are expanding ethics: it is not just what a society does to its slaves, women, blacks, minorities, handicapped, children or future generations, but what it does to its fauna, flora, species, ecosystems and landscapes that reveal the character of that society. We humans are Earthlings and care for the Earth is a developing and an ultimate human virtue.

6.9. AVENUES FOR FUTURE WORK:

The study started with a curiosity- as mentioned in the preface, but as it progressed on various phases, various aspects were rationalized, analysed upon, and findings followed, with the gradual emergence of those curious attempts in forms of data related to existing situations and policies, which became a real eye opener. As it is said, research always generates further study areas, many areas of extensive research gradually got indicated while the work progressed. The process and findings of different parameters under study here were pointers to more organised and complete versions of future works. Hence subsequent researches on relevant fields were

simultaneously identified. A few relevant avenues where this work can further be progressed with are such as how socialism acts as a base for human settlement; and a detail study of the settlement around Deepor Beel and their impact on the environment. These studies shall widen up the scopes of diverse literary and architectural researches in the near future.

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