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International environmental law: consumer environmentalism versus environmental consumerism

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International Environmental Law

Consumer Environmentalism versus Environmental Consumerism

by

Professor Rajendra Kumar Nayak
International Environmental Law

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versus
Environmental Consumerism

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Professor Rajendra Kumar Nayak
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Introduction

Mother Earth is rich, beautiful, bountiful and kind. This planet, the jewel in space, is the only planet known so far to have such advanced materialistic and spiritualistic forms of life. The history of earth reveals that the life in myriad forms is confined to a life zone of the earth as a thin veneer in the “Biosphere”. Scientific studies reveal that after the formation of the earth about 5000 million years ago, life evolved over millions of years. The microscopic organisms appeared on earth about 3000 million years ago as the first evidence of life. This is the simple beginning from which the human species evolved as early as 2 million years ago, while the intermediate stage of primitive land, planet and animals appeared about 1000 million years ago. Thus there exists, I contend, a universal unidirectional evolutionary law from resource to consumer.¹ Through the ages man has constantly been endeavouring to dominate Mother Earth and her vast resources, Has he really succeeded in his untiring efforts? This is the basic issue we are confronted with.

If the answer is in affirmative, then at what cost? Do humans know every aspect of the earth and then subject it to command or a mastery over it? To know is good but to know only to destroy is disastrous. In this regard India’s late Prime Minister Mrs Indira Gandhi aptly said:

> It is sad, that in country after country progress has become synonymous with an assault on nature........ the higher standard of living must be achieved without alienating our people from their heritage and without despoiling nature of its beauty, freshness and purity essential to our lives.²

If we examine the global ecological problem in a philosophical perspective, it has to be recognised unequivocally that the key to a cardinal solution of the ecological problem

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¹ Rajvanshi, E.P.L. Series 1 - Compendium on Environmental Protection Law, Foreword (Jaipur, 1985).
² Ibid.
lies in a social reconstruction of the existence and practice of the inhabitants of our Home - the earth on the basis of truly rational interaction with nature.\(^3\)

Constant flows of scientific and technological innovations have provided unprecedented growth of man's power in relation to nature. Albeit, since the beginning of mechanisation, human species have been inflicting cruel blows after blows on nature. During the contemporary scientific and industrial revolution these blows have been growing in speed and power. Notwithstanding, in producing material wealth humans have more and more not only exhausted non-renewable traditional natural resources but are also unconsciously breaking vitally important links between separate components of the biosphere, and consciously or unconsciously disrupting the life support systems and various vital channels of the biospheral superorganism’s life.

Thus, the International Environmental Movement has emerged owing to a fundamental change in human perception of life on earth\(^4\) and its species and subspecies. It is much faster than historical transition and change in attitude is obvious and clearly visible at every level of social organisation viz. local, regional, national and international. Indeed an ecological perception of man about the survival of planet has been broadened and the dominance over nature is regarded as a theory of the past. The world may be divided by national boundaries, but all humans are part of one biosphere and environmental degradation. Actions in one country have negative consequences for the rest of the world, for instance all nations face the negative effects of nuclear activities and of the release of carbon dioxide, CFCs etc. Similarly air pollution in any one part of the world can have global effects.

“Our Home - the Earth” also finely called in Indian tradition, “Bhavani Vasundhara” is mutely witnessing the early stages of environmental revolution and facing strenuous crisis leading to its collapse and economic decline. It has been observed that:

The attitude and action of modern man towards ecology have been of exploitation. With the result endless economic exploitations of environment and ceaseless dumping of industrial disposals and chemical effluents have created conflict with the laws of nature.  

Eventually, severe ecological upheavals are in store for the humankind it is chooses to overlook. The original 1980 Global 2000 Report to the United States President is frightening. Two paragraphs summarise the major findings and conclusions of this report:

If the present trends continue, the world in 2000 will be more crowded, more polluted, less stable ecologically, and more vulnerable to disruption than the world we line in now. Serious stresses involving population, resources, and development are clearly visible ahead. Despite greater material output, the world’s people will be poorer in many ways than they are today.

For hundreds of millions of the desperately poor, the outlook for good and other necessities of life will be not better. For many it will be worse.

Barring revolutionary advances in technology, life for most people on earth will be more precarious in 2000 than it is now - unless the nations of the world act decisively to alter current trends.

There is difference of opinion on this view also which states:

If present trends continue, the world in 2000 will be less crowded (though more populated), less polluted, more stable ecologically, and less vulnerable to resource-supply disruption than the world we live in now. Stresses involving population, resources, and environment will be less in future than now. The World’s people will be richer in most ways than they are today. The outlook for food and other necessities of life

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will be better... Life for most people on earth will be less precarious economically than it is now.  

A brief survey or environmental audit reveals that the trends are alarming as between 50 and 400 plants and animal species are being extinguished each day. The protective ozone layer over heavily populated areas is thinning as fast as scientists thought just a few years ago. Fossil fuel burning spewed nearly 6 billions tons of heat trapping carbon into the atmosphere in 1991.

The health of the planet has deteriorated at an unprecedented manner since the Stockholm Conference in 1972. During 22 years, farmers have lost nearly 500 billion tons of top soil, roughly equivalent to the agricultural land of India and France through erosion at a time when they were called on to feed 1.6 billion additional people.

The world has lost nearly 200 million hectares of trees, an area the size of the United States east of Mississippi. The deserts have expanded by 120 million hectares, claiming more land than is planted to crops in China and Nigeria together with thousands of plant and animal species no longer exist.

Since the Stockholm Conference, the population of the World has increased by 1.6 billion and that has the same in the year 1900. Every year the World's population is increasing approximately more than 92 million which constitutes the combined population of Denmark, Finland, the Netherlands, Norway, Sweden and the United Kingdom. In mid 1994, the world's population reached 5.7 billion of this 1.2 billion live in industrialised countries and 4.4 billion in developing countries. By the end of this decade, India will have become the world's second population billionaire, after China. The health of the planet ultimately reflects the health of its billions of inhabitants.

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In the Rio Conference, risks to life on earth due to ozone depletion and ultra violet radiation was in every one’s mind - the dangers not even imagined in the Stockholm Conference in 1972. However, demands for crops and products of grasslands, forests and fisheries are increasing as ceaseless exploitation of forests, over ploughing of land and overfishing in water are common practices of day to day world. Every country is involved or practicing invariably the environmental degradation equivalent of deficit financing in one way or the other.

Agenda 21 of the Earth Summit at Rio has assumed that humanity has reached a defining moment its history and that we can address that moment only if we act together in “global partnership for sustainable development”. There is enough warning to humanity by scientists, ecologists and various experts about the deteriorating health of the planet. Therefore, people everywhere need to realise and take up the task of preventing further environmental degradation. The people treat the earth in any way they like. There are so many ways by which our planet is described or addressed and they are:

* Is earth merely a ‘hotel’ or is it our ‘home’?
* Is it a place where we use its resources, then more to another spot for further exploitation? Or is it a place that we cherish and need to protect?
* Is the earth, merely a resource or retreat (something to use, enjoy or escape to), or is it our ‘relative’, the mother and father of us all?
* Is the earth a ‘machine’, a dead object with parts that we can remove and use, or is it a living ‘body’ with billions of different living organisms, all interrelated and dependent on common factors such as air, water and soil?\(^9\)

Vernadsky adopted the concept of the “no sphere” as a psychological state of knowing and communicating, permeating the biosphere. He very aptly forecasted that:

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Chemically, the face of our planet, the biosphere, is being sharply changed by man, consciously, and even more so, unconsciously. The aerial envelope of the land as well as all its natural waters are changed both physically and chemically by man. In the twentieth century, as a result of the growth of human civilisation, the seas and parts of the oceans closest to shore become changed more and more markedly.10

Vernadsky being a camp follower of his friend and colleague, A.P. Pavlov (1854-1929) ardently reiterated that human race had stepped in the anthropogenic era of geologic time and said “that man, under our very eyes, is becoming a mightily and evergrowing force”.11 Albeit man is bound by infinite number of ties to the biosphere except as his relationship is “modifiable and modified”12 by thought and effort, subject to its physical limitations. Thus Vernadsky concluded “the problem of reconstruction of the biosphere is in the interest of freely thinking humanity as a single totality”.13 The most impregnable question is as how to adjust needs of human race to biosphere without damaging or destroying its viability.

James Lovelock, a British scientist said that the bio-sphere is a self regulating entity with the capacity to keep our planet health by controlling the chemical and physical environment.14

Sandro Postel partly said that:

The human species is now an agent of change of geologic proportions. We literally move mountains to mine the earth’s minerals, redirect rivers to build cities in the desert, torch forests to make way for crops and cattle, and alter the chemistry of the atmosphere in disposing of our wastes in one form or the other. At Humanity’s hand, the earth is undergoing a profound transformation - one with consequences we cannot fully grasp.15

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11 Supra note 4 at 25.
12 Ibid.
13 Id at 25-26
14 Lovelock, Gaia: “A New Look at Life on Earth” VII-X (1979). Gaia, the Greek name for Mother Earth, is used by Lovelock to illustrate that biosphere has self regulating systems with the capacity to keep our planet in sound health controlling the chemical and physical environment. See Caldwell supra note 4 at 26.
The earth's capacity to provide more resources is seriously being affected, in terms of sustaining life of all kinds including the vast ocean of humanity 5.5 billion. Visibly, cropland is hardly expanding, agricultural land is losing fertility, grasslands facing overgrazing, fisheries overharvested this resulting in limit of seafood. Water resources, so vital to humans, are pollutingly depleting which may jeopardise future food production and urban developments. Forests reserves, which stabilise the climate. moderate water supplies, and the majority of the planet's terrestrial bio-diversity is deteriorating at a faster rate.

These developments are not amazingly new as the societies have been exploiting and changing the earth since the dawn of human civilisation. But over exploitation of natural resources resulting in the deterioration of earth began near about mid-century and continuing unabated. Sustainable development, population and economic growth in relation to natural resources are being damaged at a rapid rate.

The problem relating to environmental crimes and their short and long range solutions lie in essence, in reconciliation of man's view of life in relation to earth and its depleting resources. However, anthropologists, behavioural scientists, philosophers and theologians have been playing their roles by their interest in relation to earth, now national policy makers and politicians and law makers, are more concerned about the state of affairs of nature and its criminal situation.

Environmental crimes have generated international environmental movements of global proportions and of historical importance. These developments have no precedents but have registered major changes in human minds and human affairs. It is imperative to know to what extent are humans required to alter their attitudes, thinking, perception and lifestyle in order to maintain balance on the earth with the multitudes of species which represent the sum product of the evolutionary history.

16 See Caldwell, supra note 4 at 9.
Environmentalism consumerism, the core theme of the study, enunciates that man's development and environment share symbiotic relationships which may be termed as ecological balance and encroachment by any of these on the other(s) which leads to environmental pollution, degradation and ecological imbalance. Man for his material needs has caused cancer and that cancer lies in the man and in his vicious thinking. It is man who destroys this balance for his own ends because of his endless urges for power, position and higher standards of living and fine comforts ever known in the history of human civilisation. This has resulted into his greediness which in turn has resulted into only in imbalance but degradation in environment. Nevertheless, there is a desperate need to 'Save our Earth' and 'Keep Nature Alive'. This is possible that environmental consumerism (EC) which is also called "green consumerism" or "greenpeace consumerism" which enunciates, encourages and supports environmental friendly consumer's growth or environmental friendly consumerism. It deals also with town and country planning, land reforms, water and soil conservation minerals and energy resources, coastal management, air and noise pollution and their preventive resources and above all balanced economic growth in harmony with nature and natural resources.

**Consumer Environmentalism v. Environmental Consumerism**

Saving the planet is the utmost concern of not only a part of majority of the humanity also but of the entire humanity. It requires a complete change in the world's economic system and formulation of redefinition of man's relationship with nature. Albert Gore Jnr., the Vice President of the USA writes that this global crisis needs to be resolved not in isolation but in the perspectives offered by the earth sciences, economics, sociology, history, information theory, psychology, philosophy and religion.¹⁷ A philosopher of the environmental justice movement, Ivan Illich said "what has changed is that our common sense has began searching for a language to speak about the shadow our future throws".¹⁸ The future of earth is intimately linked with the sustainable development which is ostensible goal of environmental policy and law as

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¹⁸ Quoted in Id. at 47 (Supra note 10).
enunciated in Agenda 21 of the Earth Summit, 1992. In this regard not only developing countries but the developed countries have to adopt a visionary approach in consonance with the needs of man and the nature of both.

Human societies have been continuously destroying the planet and the problems range from the loss of the Aral Sea to the disappearance of rainforests at the fantastic rate of one and half acres per second. The destruction of rain forests due to population growth shortages of fuel, development projects and debt of developing countries to industrial countries - all lead to exploitation of natural wealth in a short term to earn foreign exchange. The human threat is equally serious to air, water and land. In this threat the two evils - the evils of technology and population explosion accelerate the threat to environment and ecology. Vast population growth rate and increasing pressure on the world resources make the environmental threat more potential.

The concern for the ecology and the endangered habitat of human race will have to be knit into economic policy and increasing concern for the ecology and ecological policy will transcend national boundaries. The main dangers to human habitat have equally been increasing into global dimensions. Environmental threats are not local in their consequences. We know very well that pollution knows no boundaries. Sulphur emissions from steel mills in America’s Midwest become acid rain blighting Canadian forests. Toxic effluents discharged into the Rhine by chemical plants in Switzerland or in France’s Alsace poison Holland’s drinking water. Radioactive particles from nuclear accident in the Ukraine contaminates Sweden’s vegetables and make undrinkable the mild of Scot cows. The Bhopal Gas disaster is still known and fresh in our mind which took the toll of thousands of lives and rendered injured uninhabitable in multitudes. The protection of ecology is inextricably linked with humankind’s survival which is more than a common task.

We assume that these resources, the formation of which took a very long time, are inexhaustible and take too little account of the negative environmental consequences in

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20 Id. at 134.
the long term. For example, deforestation is consuming reservoirs of centuries in a short time, soil erosion and peat depletion are exhausting reservoirs of millennia at a rapid pace. The formation of fossil fuels (oil, gas, coal, and lignite) and mineral raw materials such as a metal requires tens to hundreds of millions of years but current consumption is racing through the reserves at an incredible speed.21

The world-wide survey of the natural resources indicate that natural systems are deteriorating. The air pollution has reached health-threatening levels in hundreds of cities and megacities. According to the State of the World Report 1991 issued by World Watch Institute, USA, in some East European cities things are alarming. As it has reduced life expectancy several years below that in surrounding areas. More alarming is that respiratory diseases, soaring cancer rates, allergies, mal-functioning of nervous system and birth deformities are among the litany of environmental ills plaguing these societies in one form or the other.22 There is a world-wide consciousness for a clean environment but the most important question arises from the humanity at large, are we working for a better earth for our children and future generations? But the answer cannot be categorically affirmative as we are destroying it, despite already having irrevocably altered the prospects of our children and grandchildren.23 The problem of environmental degradation has increased enormously since the problem was first discussed on the international agenda of Stockholm Conference in 1972 and the Earth Summit in 1992 on the positive side it has helped to understand the problems in proper perspective.

The consumer class’s high fat diet is extracted from the earth. This is the situation in relation to the poor and middle income classes and grain is the basis of the consumer class’s diet. However, consumers do not eat the grain itself. In reality we feed it to animals and then eat the animal’s meat, milk and eggs. That conversion process is inefficient because the animals only turn some of the grain into these edible products.24

21 Highlights of the Dutch National Environmental Policy Plan: A Clean Environment: Choose it or Lose it (Booklet).
23 See, Mostafa K. Tolba, Executive Director of UNEP, Ibid.
In the United States, for example, producing each kilogram of beef served requires 5 kilograms of corn and soyabean meal. The meat eating class consumes about 40% of the world’s grain growth on close to one fourth of the world’s cropland. The consumer society is very rapidly consuming the earth’s resources. It is alarming to note that worldwide since mid-century the per capita consumption of copper, energy, meat, steel and timber has approximately doubled, per capita car ownership and cement consumption have quadrupled plastic use per person has quintupled, per capita aluminium consumption has grown sevenfold and air travel per person has multiplied 33 times. The rapid consumption in each area is intimately linked with disproportionate environmental damage on the one hand constant increase in standard of living of the people on the other. Consumption in the middle class has been slow and among the poor consumption has remained virtually unchanged. Since its birth in the United States the consumer society has influenced the worldwide and its impact is visible. The Disneyland neat Tokyo attracts almost as many visitors each year as Mecca or the Vatican. Coca Cola products are distributed on over 170 countries around the globe. Each day a new McDonald’s restaurant is inaugurated somewhere in the world.

Singaporean youngsters can brush their teeth with the “Teenage Mutant Ninja Turtle” talking toothbrush which says ‘Hey, Dudes!’ in Malay. The techniques of mass marketing first perfected in the United states are now followed on every continent teaching former East Germans for example to say “Taste the West” and Marlboro, then it is known, what it is.

In the United States, one fourth of all new household products which were marketed in 1990 advertised actively as “ozone-friendly”, “bio-degradable”, “recyclable”, “compostable” and projected something similarly. But many Americans have dismissed as pure “gimmickry”. But “green consumerism” or environmental consumerism is acquiring the status of a movement. official and unofficial organisations all over Europe, North America and Japan have started “green labelling”

25 Ibid, at 29
26 Ibid at 31.
programmes educatively suggested the consumers to buy “environmentally preferable products”. The progressive development of “green consumerism” is a hopeful sign and an important milestone in the long eco-friendly journey. McDonald’s and ‘Proctor and Gamble’ are two important business houses which have reduced their use of packaging as a result of consumer pressure. The agenda of green consumerism includes restriction on advertising of tobacco and alcohol and to curtail advertising to children to regulate environmental claims of marketers to create healthy trends.

**Consumer Lifestyles**

In the lifestyle of contemporary consumers, the use of automobiles, throwaway goods and packaging, high-fat diets and air conditioning, is based on greater environmental damage. The production of energy, chemicals, metals and papers which make life of modern man comfortably essential is most damaging to the earth and its resources. The fossil fuels that power the consumer society are its most damaged input. Taking out coal, oil and natural gas from the earth permanently injures innumerable habitats and burning them produces an overwhelming share of the world’s air pollution and refining them generates large amounts of toxic waste. According to a rough estimate the consumer class depends on energy supplies equal to at least 2,000 kilograms per capita of average-grade coal a year. The poor class people consume energy equal to less than 400 kilograms per individual and the middle income class comes somewhere in between.

Before synthetic pesticides were invented peasants around the world had their own home remedies against harmful insects. Typically they would crush the leaves of a poisonous plant dissolve them in water then spray the solution on their crops. With the advent of synthetic pesticides the long way have been discontinued. One or two applications of pesticides enabled farmers to rid their fields on insect predators throughout the growing season. This approach seemed convenient, effective and economical. But scientists have now realised that synthetic pesticides have many hidden effects. According to the World Health Organisation estimates about 20,000 people due of pesticide poisoning in the Third World each year and some synthetic
pesticides are accumulating in soil and ground water where they threaten the health of entire ecosystems.27 If synthetic pesticides are rapidly losing their effectiveness as hundreds of insects species have developed resistance to at least one pesticide formula and a dozen or so species are immune to them. Some scientists fear that pesticide manufacturers will eventually be unable to outwit insects. Third World cities are among the most life and health threatening of all human environments.28 Environment related diseases and injuries underlie millions of preventable deaths each year, in many squatter settlements, infants are 40-50 times more likely to die than in Europe or in North America.

A Chemical Plague through Toxic and Hazardous Materials

A chemical plague has affected the quality of life of people throughout the second half of this century. chemical companies have made fortunes and fortunes beyond their expectations. Hence developed chemical powers through billboards, advertising in the newspapers and magazines, radio and television and highway signboards which read - "Better Things for Better Living Through Chemicals", appealed a long running Du Pont advertisements. “Without Chemicals life itself would be impossible”.29

The Chemicals have created miracles such as antibiotics, penicillin and a vast variety of creature comforts far beyond our ancestors could have visualised. Synthetic fibres, dry cleaning, spoil proof food, crop saving pesticides, contraceptives, contact lenses and many other items by which chemical manufacturers have made good fortunes by suing tens of thousands of compounds for the material comforts of modern civilisation.

The living through innumerable compounds has resulted into chemical plague. This is well reflected in hazardous and toxic wastes which are the inheritance of a worldwide technological revolution that started in this century and developed explosively after

27 A Natural Path to Pesticides, 21 IRDC Report at 18 (July 1993).
28 Jorge E. Hardoy, Diana Mitlin and David Satterthwaite, Environmental Problems in Third World Cities.
World War II.\textsuperscript{30} The United States took the lead in discovery, production and marketing of new chemicals substances in thousands. The thousands of chemicals also produced chemical wastes. By 1965, the American Chemical Society had registered more than 4 million chemicals and the majority were of synthetic created by American chemists since 1945. Most chemicals are not potentially to harmful to humans or to the environments. Many have proved useful for increasing human life span, improved public health, stimulated economic development and quality of life worldwide. But a number of these substances have been termed as hazardous or toxic and a greater number of substances are suspected of posing risks to humans or ecosystems. Toxic substances, a smaller category do produce detrimental effects in living organisms.

According to one estimate at least 375,000 poisonings and 10,000 deaths occur every year in the Third World, resulting from the mishandling of pesticides.\textsuperscript{31} However, fertiliser or other non-pesticide or insecticide chemicals which can also be harmful to human and metabolism, is not covered. Dangerous chemicals decisively damage the environment irrespective of proper use where dangers are not always visualised. In developing countries use of chemicals is quite common but knowledge about precautions and dangers, sound development assistance are not available on sound footing. At the UNFAO Conference in November, 1985 Third World Nations declared their disappointment at “that very glaring gap left in the “Code of Conduct for Pesticides” which was approved that year. The Code identifies methods or systems by which governments can protect against hazards relating to pesticides this providing guidelines for labelling, storing, handling and disposing of toxic chemicals. Safe use of pesticides is the joint responsibility of importing and exporting governments, the industry and users.

In the USA over 3 billion pounds of pesticides are used annually.\textsuperscript{32} Out of these the US Environment Protection Agency (EPA) must review 600 active ingredients. The EPA

\textsuperscript{31} Environmental Implications of Development Assistance, “Chemical and Environmental Degradation” (Part 7) 2 Bridge (Development Services, World Vision of Australia, Melbourne) p. 16 (May 1989).
\textsuperscript{32} Rosenbaum, supra note 30 at 46.
has prohibited or limited severely the use of many pesticides including DDT, aldrin, dieldrin, toxaphene and ethylene dibromide.

In the 1990s, airborne toxins received major U.S. Federal attention in order to add large category of substances to EPA’s regulatory responsibilities. “The Superfund Amendments and Reauthorization Act, 1986” popularly called SARA required the EPA to created the first national inventory of toxic releases in the environment from U.S. industry. The EPA’s inventory of 1990 revealed toxic discharges totalling 4.5 billion pounds in 1988 - the ratio comes to about 20 pounds per person in the United States.

The details of discharges in the United States are as follows:

1. 360 million pounds go into streams and other surface waters;
2. 1.22 billion pounds go into underground wells;
3. 5.60 million pounds go into landfill;
4. 2.4 billion pounds go into the air and;
5. 1.7 billion pounds are sent to municipal treatment plants.33

The US Office of Technology Assessment estimates that this is negligible data of all releases.34 However, firms which discharge 50,000 pounds or less of toxics per year are not required to report to the EPA and are also excluded from its inventory as some chemicals are low toxicity. This toxic discharge inventory was widely publicised in the American newspapers which gave rise to widespread fear of the Americans about the use of chemical contamination of the environment.

Sometime is the last decade, a huge abandoned toxic waste site near Niagra, New York made the “Love Canal” a national issue of chemical contamination. The tragedy of Love Canal widely attracted the attention of American media about the imminent danger of abandoned toxic wastes all through in the United States. This gave rise to public pressure for congressional response. Resultantly, the U.S. Congress reacted and

33 New York Times, April 20, 1990, quoted in Rosenbaum, Id at 47.
34 Rosenbaum, supra note 30 at 47.
passed the Comprehensive Environmental Response Compensation and Liability Act 1980 well known as the “Superfund” through which an amount of $1.6 billion was appropriated to clean up the America’s worst neglected hazardous and toxic waste sites. In the mid 1980’s the magnitude of the abandoned waste problem and the cost of cleaning up waste sites exceeded original estimates. There was tremendous pressure on the “Superfund” implementation programme. During 1980 and 1990 only 34 out of the more than 1100 badly affected waste sites as earmarked by the EPA were cleaned up. America’s chemical junkyards are rising at the rate of an estimated 3 to 10 per cent annually. The disposed waste in the U.S.A. is not more than 10 per cent. The EPA has estimated that at least 30,000 dangerously abandoned waste sites exist at present in the USA but no reliable figure are available. Importance of American consumer his life style can be judged by the amount of waste they do which include 1.6 billion pens, 2.6 billion razors, and 16 billion diapers annually are collected into municipal waste dumps.

Waste recycling or incineration done in many countries around the globe, in order to reduce the volume their municipal wastes, is not the common practice adopted in the United States. Incineration can reduce the volume of municipal waste and generate energy through combustion of organic material in municipal garbage.

The Netherlands which recycles more than one half of its waste glass, Germany more than one third, while the USA recycles only one tenth of its waste glass. American indifference about recycling or incineration is due to tax codes and, pricing mechanism are responsible for discrimination in many ways against recycle materials when marketed against original and virgin materials. The solid waste problem may attract public mind and political glamour of other environmental issues like toxic waste management but it is a major issue in the environmental politics of the 1990’s in the USA. The United Nations General Assembly formally recognised the problem with its adoption of a resolution calling for the exchange of information on “banned hazardous chemicals and unsafe pharmaceutical products”.

The Basel Convention contains a number of notification provisions. Article 6 requires notification of competent authorities within the receiving nation prior to the movement of hazardous waste. The consent of the importing nation in writing is mandatory before the exporting nation does anything in terms of movement of waste with or without conditions, deny permission for the movement or request additional information. Under this convention, economic factors are also evaluated. Shipping of wastes are not allowed if the exporting state does not have the facilities, capacity of disposal sites to dispose of the wastes in an environmentally sound and efficient way.\textsuperscript{37}

The Basel Convention further states that technology transfer, including the necessary monitoring facilities is purely voluntary and financed on a voluntary basis. A mandatory surcharge might provide developing economies with the requisite incentives to efficiently dispose of their own waste as well as that of other nations. Technology transfer could render help in local domestic problems as well in the detection and handling of transnational waster problems. Identification, monitoring and storage equipment could be of great importance to control and check both domestic and international waste.

**Bio-Diversity**

Bio-diversity is a worldwide well publicised term used to describe the complete array of species - plant, animal and insect - that live on land and under water. There may be anywhere from 5 million to 100 million species on Earth, the profusion is so great that only about 1.4 million species have been labelled or catalogues so far by taxonomists.\textsuperscript{38}

Ever since the dawn of life on earth, species have been dying due to disease, lack of food or failure to adapt to environmental change. Fossil remains suggest that 5 billion species from micro-organisms to dinosaurs, have spent sometime on Earth. Scientists believe that for most of the past 600 million years, species died out at the rate of less than ten per year. Today's rate is hundreds, perhaps thousands to times high. In 1970,

\textsuperscript{37} Ibid, at 28

\textsuperscript{38} "Protecting the Diversity of Species on the Planet", *Earth Summit in Focus*, No. 7 UNCED (publ) by the United Nations, Dept. of Public Information, New York, p. 1 (March 1992).
it was estimated that one species per day became extinct. By 1990, the rate had accelerated to one per hour and by 1992 to one every 12 minutes and in 1995 God alone knows if the speed is not halted it may be more.

Biological diversity, "the variety among living organisms and the ecological communities they inhabit", consists of three categories: genetic diversity, species diversity and ecosystem diversity. 39

However, tropical forests, situated mostly in Central and South America, southeast Asia contain 50 to 90 percent of all species including two-thirds of all vascular plant species and upto 96 percent of insect species. It is estimated that somewhere between 4 to 8 percent of all rain forest species would be in danger of extinction by 2015 and from 17 to 35 percent would be in danger of extinction by 2040.

Some scientists have calculated that the planet is in the process of a "great dying" - a period of mass extinction like that which may have killed the dinosaurs and most other forms of life 65 millions years ago. It is hard to assess full ramifications of the loss of so many species - including the impact on human beings. 40

Bio-diversity loss is irreversible. It is our living natural resource base and one biological capital in the global bank and without which we could not exist as a species. Simply stated biodiversity is life on Earth, comprising the ecosystem, ecological processes and the wealth of species that inhabit the planet. If a plant or animal species becomes extinct, it is gone forever and that can be saved by political will or providing some kind of economic incentive. 41

Loss of species is due to conversion of tropical forests into agricultural lands, overfishing, pollution and the effects of unsustainable levels of mining and timber

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39 Elissa Blum, Conservation Profitable, A Case Study of the Merck/INBio Agreement, 35 Environment (USA) 17 (May 1993).
40 Nanda supra note 36 at 1.
production. The greatest cause of species extinction is the disappearance of natural habitats - forests, wetlands and coastal regions - through deforestation, urban sprawl, rural development, air and water pollution, over population and other areas and needs linked with human societies.\textsuperscript{42}

Humans have been exploiting natural ecosystems ever since they became agriculturalists 10,000 years ago.\textsuperscript{43} The industrial revolution quickened the space of development hence the exploitation of natural resources began at a faster speed. It took 500,00 years before the global population reached 1 billion make in the year 1850 and 6 billion by the turn of the present century. Hence, the use of land and natural resources have been used unabated and ceaselessly exploited. Even the unique species discovered by Darwin on Ecuador’s Galapagos Island are now endangered by animals brought by recent human settlers.

A third cause is global warming in the event the worlds climate changes according to many scientists prediction that many plants and animals will no longer be suited to their environments in the next 50 years. This could affect the world’s ability to produce food. In reality, plants, being immobile, cannot adapt as quickly as animals. In the event that climate patterns change only slightly, even then carbon dioxide levels will rise in the atmosphere which is likely to affect plant growth. However, any increase in harmful ultraviolet radiation associated with depletion of the ozone layer could also alter or obliterate species, which is a very serious phenomenon.

We rely on biodiversity in our daily activities. In the United States 25 percent of all pharmaceutical prescriptions contain active ingredients from plants, and some 3000 antibiotics are derived from micro organisms.\textsuperscript{44} Another example is coffee - a daily beverage for millions of people around the globe which is a major export crop for many Latin American and African countries.\textsuperscript{45}

\textsuperscript{42} Earth Summit in Focus, \textit{supra} note 38 at 2.
\textsuperscript{43} \textit{Supra} note 33 at 2.
\textsuperscript{44} See Mittermeier, \textit{supra} note 42 at 5.
\textsuperscript{45} \textit{Id.} at 5-6.
It is however, also susceptible to diseases like fungal rusts. To maintain the genetic viability of coffee crops, it is important to conserve wild relatives in their places of origin like the highlands of East Africa and the eastern rain forests of Madagascar, where more than 50 wild species of coffee are grown. Nevertheless conservation of coffee crops in Madagascar is necessary, conservation of certain areas is critical to agriculture.

Agriculture provides for more than 30 percent of the gross domestic product of low-income developing countries. The value of agricultural trade is an excess of US $ trillion annually, yet much of our global civilisation rests on the cultivation of only seven grasses: rice, wheat, barley, oats, sorghum, millet and maize. These need constant genetic input from wild relatives and devices to maintain their resistance to pests and disease. Natural diversity of the wild relatives of these seven grasses must be maintained and seed banks are not enough to do the job. It is therefore, crucial to protect areas where the wild relatives of these critically important species grow. Furthermore, an additional 20,000 species of grasses exist, the vast majority of which are not being used.

The question arises why is so much of the World’s bio diversity in grave danger of destruction? It is due to incompatibility of short-term economic growth with the sustainable development of natural resource. In the event of a developing country faces economic problems, it has to choose ether to sell timber from the forest or leave the forest safe without exploitation, in such a situation the country opts for the former for the large profits and also for its existence. As economic gains to the country are more compelling than future environmental costs, deforestation process knows no boundary of bio-diversity preservation. When biological resources are used, the resources are treated to be free gift of nature. Nevertheless, externalities occur when there are no formal ownership fights to a good or to operate. It is quite difficult for a country to earn profitable returns from the environment as many nations are not willing to spend good and reasonable sums of money to preserve it.

46 Id. at 6.
47 E. Blum, supra note 39 at 18.
In order to make resource conservation ore profitable than resource exploitation, countries invent ways and means to do it expediently. In this regard they can do so by expressing sovereignty over their natural resources, accepting the responsibility for their conservation and limiting access to those who abide by certain regulations in some way.

The control over natural resource exploitation was first discussed in a Summit in Managua, Nicaragua on 6 June, 1992 and the Meeting of the Presidents of Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama and consequently a non-binding resolution was signed that encouraged passage of laws to regulate and restrict the exploitation of natural resources from their countries. The chief objective was to prevent aliens from invading their nations wildlands, exploitation and extraction of valuable resources without compensating the host nation.

The presidents of these countries in their national interests signed the agreement to regulate the foreign companies, especially bio-technology and pharmaceutical firms which were exploiting Central America’s natural resources to develop drugs without providing profits. The case of the Madagascar periwinkle is often mentioned as the main example of this kind of exploitation of natural resources. The multimillion dollar cancer drug vincristine was developed and it is a sad story that Madagascar received no payment or share of royalties. It reveals the limit of exploitation by the big multi-nationals. During the last 20 years, Costa Rica has lost more than $4 billion from unrealised returns on natural resources exploited mercilessly as estimated by the World Resources Institute, USA.

Exploitation and extraction of biological resources were never regulated by laws in any Central American country. The process has been reversed as “the Central American Commission on the Environment and Development”, and the laws passed by individual countries of the region under this resolution have provided guidelines for extraction of resources, future access to patents on the resources, However rules ensure the transfer of technology to the host country, access to advanced research materials and sharing
the expertise necessary to market the developed products”. All these are happy developments in one form or the other in the larger interest of Central American Countries.

**Protecting Bio-Diversity**

In order to preserve the full range of species is to protect large areas of natural habitat. However, such action is necessary worldwide by the battle will be won or lost in the tropics, where went, warm ecosystems such as rain forests, coral reefs and coastal waters support perhaps two thirds of all species.48

**Ceaseless Exploitation of Nature’s Wealth**

The destruction of bio-diversity would directly result into the destruction of unique chemicals that may not be replicable in the laboratory.49 Although the number of drugs developed directly from natural resources may be small, it has been estimated that one quarter of all medicinal prescriptions in the United States are based in some way upon plants or microbes or are synthetic chemicals derived from them. There are several examples such as drugs derived from natural resources including penicillin, developed from a mold, taxol, a cancer drug from yew tree bark and the antibiotic streptomycin, developed from a soil sample. It is to be emphasised that biological loss is an irreversible process which the destroyer must understand well. One a plant or animal species becomes extinct, it is gone forever.50

Entire planet can not be turned into a desolate urban ecosystem shared mainly with rats, cockroaches and pigeons. Bio-diversity is by no means evenly distributed over the planet.51

48 “Earth Summit in Focus”, supra note 38 at 2.
49 E. Blum, supra note 39 at 19.
50 Mittermeier et al, supra note 41 at 6.
51 Id, at 7.
Nevertheless, certain areas are far richer than others in overall diversity and in endemism (species that are found only in particular places and nowhere else). Many such places and many species are under severe pressure of degradation and extinction. Tropical rainforests provide us with a clear example and it is estimated that more than half of the earth’s original humid tropical forest has disappeared and the remaining about one quarter has been degraded or turned into desert or barren land. Some countries and regions, for example Madagascar, the Philippines, the Atlantic forest region of eastern Brazil have already lost up to 95 per cent of original forest cover. Some fifteen priority tropical rainforest regions have been earmarked as “threatened hotspots” needing immediate attention in order to survive.

These forests occupy approximately four percent of the planet’s land surface and harbour 30 percent of all terrestrial life forms - and a much higher percentage of those which are at risk in one way or the other. Nevertheless, analysis is quite preliminary in nature even though the hotspots approach has helped the governments, communities, international donors and NGO’s to plan their conservation targets and funds. To save threatened rain forests areas “Conservation International” developed the ‘Rapid Assessment Programme’ which guides experts to a location in the tropics to conduct quick surveys of its biological resources.

Serious efforts are being made to fix ‘hotspot’ areas of other major ecosystems or biomes. These include wetlands - such as the Pantanal of Western Brazil, the Okavango Delta in Botswana and Sudd Swap of Sudan. Others being studied are deserts such as the Sonoran Desert of Mexico and the South western U.S. and a number of large lakes including the Rift valley lakes of East Africa. Some countries have biodiversity riches therefore they are called mega-diversity countries. Some 12 countries are home to 60 - 78 percent of the planet’s life forms - including freshwater and marine life. The richest of these countries are Brazil, Colombia, Indonesia, Madagascar, Mexico, Peru and Zaire according to the UNDP. These areas are likely to assume increasing recreational, aesthetic and spiritual value on our ever more crowded planet. These areas include the southern portions of the three Guineas, southern
Natural selection or survival of the fittest had little to do with the death of the dodo, passenger pigeon, or stellar’s sea cow. Human greed is responsible for our ‘most destructive’ present phase. At the rate at which habitats are vanishing, it is predicted that extinction in the earth could be 130 species per day within the next decade.\(^5^2\) But there are good people and good corners in the world where people work to protect life on earth in one form or the other. The recent rediscovery of the Vu Quang calf in Vietnam is a sign that all have not quite vanished - there is hope that, while ‘Jurassic Park’ is a very unlikely scenario, man has not managed to destroy all life on Earth forever. In this context it is necessary to mention three significant rediscoveries of rare mammal species in Southern India. The ‘Malabar Civet’ which was missing for three quarters of the century has been seen. Strikingly attired with broad and narrow alternating black stripes and bands and black and white rings on its tail, the animal was said to be, about the size of a country dog. It was common, but occasionally seen animal of the evergreen forests of western ghats from Honavarim North Kanara southwards in South India. Its civetine scent substance produced by anal glands was most sought after and costly products used extensively in Ayurvedic system of medicinal preparation and cosmetics.\(^5^3\)

In the northeast of India medicinal bio-diversity is undergoing rapid decimation.\(^5^4\) Illegal trade and commercial exploitation are regular features in relation to “Surviving natural riches in a region which is one of India’s pristine cornucopias of medicinal plats and herbs”. The present state of consumption would threaten a multitude of rare and indigenous medicinal flora. These include plants and their parts such as roots, leaves of bark, most of which are used for the extraction of oils, resins and powders. some are used in cure of high blood pressure, some - used in curing of amoebic dysentery, some


\(^{53}\) Id. col. 3.

\(^{54}\) S.Z. Subhani, North-East Rapidly Losing Rare Plants, The Times of India (New Delhi), p. 22 (March 19,1994).
used in the preparation of cancer drugs and ulcer cures, moña neem (Azadirachta indica) - some are blood purifiers which also treats contagious disease, and some are - a cure for fever and “Pipalio” (Piperlongum) - a widely used component in curing about 22 diseases, especially chest ailments. A big chunk of these medicinal raw materials caters to other domestic and global markets. From the State of Assam in North-East India more than 400 plants and herbs find their place in the pharmacopoeia of countries like Russia, USA and UK. Many medicinal plants trade in underhand. Exports from the wild are banned under the centre’s export-import policy. India’s Wildlife (Protection) Act, (1972) also bans removal of plants and herbs from protected areas reserved forests, sanctuaries and national parks.

Around the globe, every country’s biodiversity is important to its own viability and to the world at large and need to be conserved. Certain parts of their planet has have much high concentrations of biodiversity than others and that frequently these areas prone to greatest risk. Some places need large share of global investment either through UNDP or GEF (Global Environment Facility) in biodiversity conservation. Strategies for their conservation could be establishment of parks and protected areas, major natural resource policy reform on national, regional and local level, public awareness building highlighting on endangered species and development of markets for natural products such as food oil that are harvested sustainably. In view of critical economic situation of many tropical countries, an emphasis on economically based conservation is essential.

Sustenance of the world’s bio-diversity is an environmental challenge that can’t be met through only technological innovations. It is to be based on the supportive economic needs and aspirations of local populations and thus to develop any system on their capabilities to promote long term conservation of Earth’s diverse vital life forms.55

55 Mittermeier et al, supra note 41 at 8.
Geopolitical Values of Bio-Diversity

Bio-diversity is crucial in maintaining global geopolitical stability which is also described as "ecosecurity". In poor countries environmental degradation is rampant based on daily needs such as shortages of fuelwood, food, fibre and other divers ecosystem products. These shortages become acute by population growth, economic and social crises, create a downward spiral that become difficult to deal with.

In the Western Hemisphere, Haiti and El Salvador are the countries facing degradation of the environment and are trapped in the vicious cycles of eco-political instability. Breaking them will not be so easy with or without democratic systems. Economic values dominate the value of bio-diversity particularly in the area of international exports.

International Action on Bio-Diversity

A very serious effort to save bio-diversity at international levels began in 1989, nearly 50 organisations from 15 countries started collaborating with key UN agencies on a global bio-diversity strategy to halt species loss, under the coordination of UNEP. The World Resources Institute and the World Conservation Union (IUCN) made the following recommendations: 56

I. Countries must declare sovereignty over genetic assets to protect their commercial interest as the market for biological resources expands.

II. Laws that contribute to the loss of biological diversity - such as agricultural supports that promote pesticide use and other unsustainable farming practices - must be overhauled.

56 Earth Summit in Focus, supra note 38 at p.4
Ill. Governments must provide incentives for grass roots participation. Those who everyday lives are intimately involved with their natural surroundings, especially indigenous peoples, are resources for future generations.

IV. The UN and governments must expand networks of protected areas, such as parks, zoos, botanical gardens and seed banks.

V. There must be an institutional framework to catalyse action and sustain commitment over the long term.

These recommendations emphasise and warn that present day "massive loss of species and habitat will be slowed only when the human community realises that the Nature" bounty are not to be exploited or destroyed recklessly for all times to come. But if nature is to be treated as an ally or friend she needs respect and replenishment in consonance with "the tenets of sustainable development". 57

"We are part of the web of life. Many strands already have broken. We must act quickly to repair what we can".

The Bio-Diversity Treaty
Grave concerns on biological diversity started with a draft prepared in 1987 by IUCN. Formal negotiations began in November, 1990 under the sponsorship of UNEP. There were concluded in Rio when 153 countries excluding the United States, signed the Treaty to protect biological diversity to use it sustainably. 58

The Treaty supports guidelines to make economic use of natural resources more compatible with their planned conservation.

57 The Clinton Administration signed the Bio-diversity Treaty which was declined by the Bush Administration. One of the reasons why the Bush Administration refused to sign the Treaty was because it did not seem to protect intellectual property rights to the extent that biotechnology and pharmaceutical companies desired. The U.S.A. feared that the vague language of the Treaty would be interpreted such a way that the U.S.A. would lose its comparative advantage in the Field. The annual sales of the commercial biological products are expected to reach $50 billion by 2000. The transfer patent rights to a new drug to a developing country.

58 See E. Blum, supra not 39 at 19.
The Treaty is consistent with Agenda 21 which covers both diversity (Ch.15) and biotechnology (Ch.16)). The preamble contains many important principles, including innovations such as recognising “the vital role that women play in the conservation of biological diversity and the desirability of sharing equitably benefits arising from the use of traditional knowledge, innovations and practices (of indigenous and local communities). Reflecting on the interests of many countries especially developing ones, that Treaty should not give the international community any rights over the management of a nation’s biological resources. The preamble affirms that conservation of biodiversity is a common concern of all mankind and that states are responsible for using the biological resources sustainably.

However, it is largely a “framework” agreement, setting out principles which will need elaboration by future meetings of the conference of the parties before they can be expected to be fully effective. The wording of the Treaty is rather weak with many obligations being qualified by “as far as possible” or as appropriate”. The provisions on intellectual property rights and transfer of technology rights are confusing. There is little on important policy and institutional issues such as land reforms, empowerment of communities and incentives to bio-diversity.

The Merck/INBUI Agreement on Bio-Diversity

The agreement between Merck & Company, the World’s largest pharmaceutical company, and the Instituto Nacional de Biodiversity (IN Bio) in Costa Rica is an example based on and encouraged by the Biodiversity Treaty signed at Rio in the Earth Summit. The agreement announced on 19 September, 1991 is a two year “collaborative research agreement” under which Merck agreed to pay INBIO a sum of $1 million for all of the plant, insect and soil samples the Institute could collect. In addition to a percentage of the royalties from any drugs that Merck develops from

60 Id at 22.
61 E. Blum, supra note 29 at 20.
samples provided by INBIO, the royalties will be divided equally between INBIO and the Costa Rican Ministry of Natural Resources.

INBIO agreed to contribute 10 percent of the budget and 50 percent of any royalties to the government’s National Park Fund for the conservation of national parks in Costa Rica. However, Merck agreed to provide technical assistance and training to help establish drug research capacity in Costa Rica.\(^{62}\) It is aptly described:

> The agreement is a win-win situation. It protects the proprietary rights of the industry, while at the same time recognising that it is to the advantage of industrial nations to help with custodianships of natural resources.\(^{63}\)

The agreement represents an important milestone in the history of biodiversity prospecting which means “exploration of biodiversity for commercially valuable genetic and bio-chemical resources”.\(^{64}\)

**Marine Pollution**

Seas have become the virtual sinks for global wastes due to large scale human activities in and around the planet, resulting into vast scale pollution. This has become growing problem of the world. The pollution effects can be seen in the Baltic and Mediterranean seas.\(^{65}\) Some of the sources of marine pollution are shipping, dredging, mining and drilling, ocean dumping of hazardous materials and land based activities as wetland and estuarial filling, effluent discharges and plastics of several kinds.\(^{66}\) Land based pollutants are sent by air, gases, water sewage and industrial waste in rivers.\(^{67}\) Large sources of land based wastes lie in resource development and agricultural activities in discharge of sediments, pesticide and fertilisers with sulfates nitrates and chlorinated hydrocarbons. Radioactive waste is also very serious to the conditions of


\(^{63}\) E. Blum supra note 39 at 20.

\(^{64}\) Reid, supra note 62 at 192.

\(^{65}\) See Caldwell, supra note 4 at 293.

\(^{66}\) see Caldwell, supra note 4 at 293.

\(^{67}\) Id. at 294
the oceans. Two important international treaties deal with ocean dumping. They are the “Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter” known as (London Convention of 1972) and “Convention for the Prevention of Marine Pollution by Dumping From Ships and Aircraft’s” known as (Oslo Convention of 1972). The London convention is generally applicable to the high seas, whereas the Oslo convention pertains to the northeast Atlantic. A Report entitled Ocean Dumping: A National Policy, issued by the U.S. Council on Environmental Quality on October, 1970 gave lots of importance to these International Conventions. Many of the recommendations in the US Report became part of US statutory law with the passing of Marine Mammal Protection, Research and Sanctuaries Act, 1972. “The International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties” and “the International Convention on Civil Liabilities for Oil Pollution Damage” both became effective in 1975. A supplementary document, The International Fund for compensation of Oil Pollution Damage, signed on December 1971 but became effective in 1978 after receiving enough ratifications to become effective. It is certain that international recognition of the harmful of ocean pollution, national economic interests have remained powerful enough to thwart or delay action for imposing cost, inconvenience or responsibility on shipping interests.

Plastic Pollution of the Oceans

Industries create the plastic material for human consumption and same plastic material is dumped into seas after use. As a result it has come back to those human beings and killing and maiming marine life. The industries dumped right from plastic bottles, plastic bags, styrofoam, plastic gloves, plastic lids, foam packaging, plastic rope, plastic produce sack, akro syrup jug, plastic fishing line, plastic bleach bottles, plastic egg cartons, pieces of plastic net to 50 pound plastic bag of sea salt and Bic lighters. Throughout the world, important water bodies especially the oceans have turned in real sense wastebins for the tons of plastic products dumped daily by commercial

68 Id. at 295.
69 Id. at 294.
fishermen, military vessels, merchant ships, passenger liners, please boats, offshore oil and gas drilling operations and by the plastic industry and sewage treatment plants. It is difficult to estimate the damage done by plastic pollution to the seas. The way back in 1975 the National Academy of Science (USA) estimated that seven million tons of garbage are dumped into the world’s oceans every year. Since 1975 the situation has changed a lot due to accelerated rates of economic growth and human consumption of material goods the world over.

The production of plastics has more than doubled since 1975. A 1985 report estimated that merchant ships dumped 4,500,000 plastic containers each day into international waters. The amount of plastics is washed ashore. Mustang Island and other tourist beaches along the Gulf of Mexico, a body of water that shelters a busy international port and hosts extensive offshore oil activities look like cluttered landfills. In September, 1987 three hour cleaning of 157 miles of Texas shoreline reaped 31,773 plastic bags, 30295 plastic bottles, 15,631 plastic six pack rings, 28,540 plastic lids, 1,914 disposable diapers, 1,040 tampon applicators and 7,460 plastic milk jugs. It is distressing to note that in modern times synthetics developed by man to outlast and perform effectively - the products made from natural materials are ravaging nature in the process. Plastic has occupied good place in the American way of life as more durable than wood and rubber, lighter than metals, safer than glass and less expensive than leathers. It is present in virtually every product line from army helmets to artificial hearts to styrofoam cups. In the US economy, plastic industry plays a crucial role as more than one million workers are employed almost in every state and which enabled all the states to produce $138 billion in finished goods. The 1.2 trillion cubic inches of plastic manufactured in that year was nearly double the combined output of steel, aluminium and copper. Plastic uses have no problem but problem contains in their disposal. Plastic easily misleads the sea animals as they treat as food. It is most common type of sea hazards and sea garbage. In the scientists view plastic is the most far reaching mad made threat facing many marine species, killing or maiming tens of thousand sea birds, seals, sea lions and sea otters and hundreds of whales.

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71 Id. at 60.
72 Id. at 61
dolphins, porpoises and sea turtles. It is not difficult to see oil spills or toxic chemical spill and sea animals struggling for survival. Plastics are individual mines dangerously floating around the ocean just waiting for victims to trap in either to die or struggle for life. Thousands of marine animals die every year from entanglement in plastic trash. Sometimes an animal accidentally swims into a piece of plastic and becomes ensnared, unable to escape. 73 Curious seal pups are often attracted to floating debris and become entangled. Birds not only become entangled in plastic connector rings and fishing line, but also use plastic nesting material s, which can create death traps for their young. Plastic debris is not just a problem for wildlife. Plastic also can be a floating menace to navigation. Boaters report that plastic rope and line fouls propellers and that plastic bags and sheeting clog seawater intakes and evaporators, causing engine failure, costly repairs and delays. This type of vessel disablement can be life threatening. As a result vessels worldover have made the ocean their home and their dumping grounds and disposing of wastes that will never be allowed. The dangerous consequences on total population of marine animals was first discovered in the late 1970’s. The victims were the northern fur seals of the Pribilof Island located in the Bering Sea west of Alaska in the USA. The National Marine Mammal Laboratory of the USA discovered through their investigation that plastic dumps were killing 40,000 seals a year. 74 The plastic industries are trying to solve the problems by recycling the wastes and some laws deal with the problem in the United States.

In the US the “Marine Plastic Pollution research and Control Act, 1987”, (MPPRCA) which is Title II of Public Law 100-200 deals with the problem. This new law implements Annex V of “International Convention on the Prevention of Pollution from ships (MARPOL) 1972”. The MPPRCA was amended in 1993 to effect overboard discharge of garbage from vessels at sea and granted five year extension for the USA Navy to comply with overboard dumping restrictions. 75 The amendments also allowed for additional extensions for Naval vessels in Special Areas and submarines. When the Untied States passed MPPRCA in 1987, government vessels were required to comply

73 see pamphlet, Center for Marine Conservation (Washington D.C.).
74 Weisskopt, supra note 70 at 61.
75 “Legislative Connection” in coastal Connection (Center for Marine Conservation, Washington D.C., USA), 6 (Spring, 1994).
with the law after a five year exemption. The final amending language specifies that: By December 31, 1998, all surface ships will be in full compliance with MPPRCA. Between now and then, a strict schedule of installation, so that by 1998, 100% of ships will have the necessary equipment on board to handle their waste. As ships have machinery installed, they may be considered in compliance with law. The Navy will publish the names of these ships once a year. Containment of plastics on submarines remains a problem. But by 2008, they will not be discharging plastics any more. The Navy is required to comply with all special areas requirements by December 31, 2000 for surface ships, and 2008 for submarines and the Navy will be working in the next three years on a plan for how they will be complying. The MARPOL and its 1978 protocols are comprehensive. This was opposed by the shipping interest and national governments responsive to their objections. But in October, 1982 MARPOL was ratified by the states and was put into force. On May 30, 1989 the US Coast Guard interim rule implementing the regulations of MPPRCA and thereby MARPOL Annex V became effective. Under the law, ports and terminals servicing vessels arriving from foreign destinations will need to provide separate trash receptacles for plastic and other goods. It is especially critical that old fishing nets and other discarded plastic fishing gear receive appropriate disposal rather than being a “lost at sea”. “Lost fisher gear” has been identified as one of the most damaging of plastic pollution threats to the sea. Annually, thousands of marine mammals and other species are trapped in this gear and costly repairs are incurred by many vessels when lost gear become wrapped around their propellers. Cities, towns, fishing co-ops, the state and private terminal operators must realise their obligations to provide their trash disposal facilities under the US law. It is interesting that a Seattle firm in the USA was fined $150,000 in 1989 for dumping of plastic. The owners of a factory trawler based in Seattle pleaded guilty to dumping plastic in the gulf of Alaska in 1989 and paid the said fine. This is the first criminal penalty ever assessed and imposed for a violation of the Marine Plastic Pollution

76 Tom Brillat, “Marine Plastic Pollution and MARPOL Annex V” in A Rhode Island Sea Grant Report.
Research and Control Act of 1987 (MPPRCA). The company paid the criminal fine, the maximum allowed by law and the highest fine ever imposed for such a violation.

**Egypt’s Lake Manzala and Its Cleaning**

Egypt’s Lake Manzala, the largest coastal lake, situated squeezed into the far northeastern tip of the Nile Delta near Port Said and the Suez Canal is suffering from ecological ills. It is not only be pollution but also by land reclamation projects on the lake’s inland shore and by disrupted water circulation patterns stemming from the closure of a key outlet to the sea. The lake’s condition deteriorated with the halting of annual flooding from the Nile when the Aswan High Daw was constructed in 1960s. This deprived the lake of the rich sediments that were flushed downstream with flood waters and which provided a source of food for the fish.

The benefits of clean lake will not be confined to Lake’s fisherman or to Egypt’s consumers. Nevertheless, pollution levels throughout the eastern Mediterranean can be significantly reduced if Egyptian waters coming from Lake Manzala are sufficiently cleaned at the time of ocean discharge. The UNDP sponsored Mediterranean Action Plan, an intergovernmental agreement aimed at stopping sea water pollution would be a welcome measure in improving the environment and quality of water as well. The GEF (Global Environment Facility) funded the project is to enhance biodiversity in and around the Lake Manzala. Any improvement in water quality will also lead to greater diversity of water fowl and fish species, both migratory and non-migratory including plant life. The project is aimed also to generate local employment. A new marketable new product - cooking fuel derived from dried aquatic plants is supposed to improve local economy.

The Egyptian government convened a Supreme Committee for the Rehabilitation of Lake Manzala in 1991. Since then some national organisations as the Water Hyacinth

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79 Id. at 30-31.

80 Id. at 32.
Institute, the Water Research Centre and the Central Laboratory for Fish Research have joined together to find a way to clean up of a national symbol of Egypt’s determination to preserve its environment.\textsuperscript{81}

The UNDP sponsored Mediterranean Action Plan in intergovernmental agreement aimed at stopping sea water pollution would then be a good step further to implementation. Global Environment Facility (GEF) funded project is also contributing in enhancing biodiversity in and around the Manzala Lake.

**Black Sea and its Survival**

The Black Sea, where waters touch coastline of Bulgaria, Romania, Turkey and the former USSR has sustained a thriving marine life for centuries. However, residues of modern agriculture and industry threaten to bury all living organisms inhabiting its waters under a cascade of poisonous chemicals.\textsuperscript{82}

The “Black sea is on the verge of catastrophe” and the situation is so grim that all life could vanish. The chemicals poisoning has resulted into polluting the atmosphere and a situation could arise that whole towns affecting its waters would need to be evacuated. In small inlets, one can already detect pollutants rising into the air.

The Black Sea is especially vulnerable to pollution because it collects ten times more water per square metre of surface area than any other sea or ocean. Much of that pollution gushes into the sea from several major European rivers. The most important is Danube, which flows through eight highly industrialised countries which also practice chemically intensive agriculture said Professor G.D. Dechev, head of Bulgaria’s Institute of Ecology in Sofia, Bulgaria.

Since the dawn of history, to begin with ancient times, wind, rain and river waters annually deposited natural fertilisers in the form of leaves and other organic matter in

\textsuperscript{81} Id. at 31.
the sea. Over thousands of years, this biomass settled in the bottom and began to decompose and diminish the supply of oxygen. Hence, oxygen cannot penetrate below the layer of fresh water of the supply reaching the bottom has always been limited. Without it, decomposing matter produces hydrogen sulfide, which is toxic to living things.

The UNDP, the WHO and the UNEP, the coastal countries have been trying to agree on a convention to assess properly the sea’s environmental problems and draw up a blueprint to attack them.\(^3\)

A workshop of international experts was organised in Sofia to consider a joint Bulgarian Soviet proposal to launch a research and monitoring programme to be carried out by national scientific institutions and international organisations. A task force has prepared a final draft of this proposal. It will be closely linked to a complementary international effort to tackle the pollution problems of Europe’s major rivers and in that process Black Sea will get attention to keep alive.

Whales and Dolphins drowning in illegal driftnets have also posed problems. Due to legality of Norwegian commercial whaling under the whaling convention (the International Convention for the Regulation of Whaling, 1946), it was determined in Kyoto to continue the moratorium on commercial whaling under which catch quotas of all commercially exploited whale stocks were set at Zero from 1986.\(^4\)

There is a worldwide protest against commercial whaling by Norway. “Greenpeace” (An International NGO) reveals that modern trawling nets - some large enough to encircle 12 Boeing 747 Jumbo jets are being used in a desperate attempt to catch fish. These and other methods trap millions of dolphins, albatross and other non-target animals across the oceans.\(^5\) Global overfishing and uncontrolled use of fishing gear is endangering fish stocks and threatening health of the oceans. In this regard European

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\(^3\) Id. at 27.


\(^5\) “THROP” consultation a SHAM” 14 Campaign Report (Greenpeace, UK) September, 1993.
commission has indicated that resumption of commercial whaling as announced by Norway in 1993 may have repercussions on international cooperation relating to conservation of whale and dolphins as species.86

Agenda 21 of the Earth Summit held at Rio in 1992 deals in Chapter 17 about protection of the oceans, all kinds of seas, including enclosed and semi enclosed seas and coastal areas and the protection, rational use and development of their living resources. Chapter 17 deals extensively on the marine environment including the oceans and all seas and adjacent coastal areas from an integrated whole that is an essential component of the global life system and a positive asset that presents opportunities for sustainable development.

Chapter 17 deals with various programme areas, which are:

(a) Integrated management and sustainable development;
(b) Marine environmental protection;
(c) sustainable use and conservation of marine living resources of the high seas;
(d) Sustainable use and conservation of marine living under national jurisdiction;
(e) Addressing critical uncertainties for the management of the marine environment and climate change;
(f) Strengthening international, including regional cooperation and coordination;
(g) Sustainable development of small islands.87

**Deforestation**

The last decade of the present century is facing the World's great ecological crisis rather worst crisis in terms of the continuous degradation of tropical forest since

86 See Davies, supra note 84 at 271-272.
considered endless resources. But those resources are fast becoming limited, scarce and degraded to meet people’s needs and wants and all the ecological services a healthy planet requires. 88

The industrialised countries began clearing their forests in the 6th Century. Some 32-35 percent of temperature forests have been lost since pre-agricultural times, compared with about 15-20 percent of old-growth tropical forests. 89 Three quarters of Europe (not counting the former Soviet Union) was probably covered by forest; about 50 percent of the original cover has been cleared. More than a quarter of all forests grown in the USA in the 17th Century had been cut before programmes to replant trees began during this century. Nevertheless, newly planted trees cannot fully replace old-growth forests to have an ecological balance. During the 1982, the last of the virgin timberlands were being cleared at the rate of 24,000 hectares per year and the government is under pressure to open up public land in the North West to promote logging interests. One out of every four logs is exported - much of it to Japan to build homes. In Canada, which has been called the Brazil of the North, over seven million hectares of forests were burned in 1989, some to million hectares are burned in an average year. In New Zealand, settled as late as 1840, the islands have been almost cleared of forests to create land for the sheep and cattle grazing on which the wealth of the country has been built.

In a period of the last 10,000 years the earth’s rich forests and woodland have reduced by a third as trees were cut to make way for crops, pastures and cities. It is estimated that some 17 million hectares of tropical forest being lost per year. Very few nations have taken stock of the biological values and conditions of their forests. The available best estimate is around 1.5 billion hectares of undisturbed primary forest out of 6.2 billion that existed before settled process of agriculture stated. However, it is disturbing that half the original activities of peasants, loggers, ranchers and land speculators and remaining half is suffering due to great demand for timber and other human needs and facing threatened ecological future.

Europe's original forests have vanished, "replaced largely by intensively managed tree stands composed of just a handful of species. The vast uncut area are in the northern reaches of Canada and in the erstwhile Soviet Union "where most woodlands have been too remote and unproductive for large scale economic exploitation or humansettkenebt. Any kind of secondary forest or plantation cannot substitute the biological richness or ecological importance of primary forests. Actually the timber industries have enjoyed "a one time bonanza of harvesting". Deforestation occurred much earlier in temperature nations but with different consequences from those incurred in tropical nations. Logging in the tropics degrades some 4.5 million hectares of rain forests per year and results in the deforestation by making woodlands more susceptible to fire and become easy for the peasants and ranchers to clear thus resulting in the direct forest loss.

World's commercial timber harvest is estimated to be nearly 1.7 billion cubic metres per year and supports an international forest products trade worth $85 billion yearly. There are three timber giants - The USA, former Soviet Union and Canada, they supply more than half of the World's industrial wood.

During the past decade, tropical forests have been disappearing at the rate of tens of thousands of square kilometres per year. Deforestation rate has gone up by more than 50 percent and the world lost 10 percent of its tropical forests. In the several parts of the world, logging is done in the fashion of "cut and run" which "typified" North America's expanding agricultural frontiers a century earlier. Shrinking of forests in the developing countries have resulted in the loss of valuable natural wealth. "Tropical deforestation creates widespread social and economic turmoil, drives countless plant and animal species to extinction and contributes to greenhouse gasses".

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91 Caldwell, supra note 4 at 221.
92 supra note 89 at 76.
93 Nels Johnson and Bruce Cabarle, "Surviving the Cut: Natural Forest Management in the Humid Tropics", (World Resources Institute, Washington D.C.) 1 (February 1993).
94 Ibid.
In China the area of timber production forests has shrunk by nearly 3 million hectares since 1980; however, at present harvest rates, it is estimated that remaining production forests of harvestable age will vanish in a decade’s time.\(^95\) China openly admits timber supply crisis which imported 25 million cubic meters in 1990 that will ease the crisis partially.\(^96\)

The situation in my own country India is equally dangerous. Its forests have been shrinking by 1.5 million hectares per year. Due to low productivity, these woodlands can provide an annual harvest of no more than 39 million cubic meters that amounts to only 0.046 cubic meters per person for both fuelwood and industrial wood consumption of 1.86 cubic metres per person - 40 times higher. Government figures project that India’s demand for wood would go up to 289 million cubic meters by 2000, more than seven times the estimated annual growth, decisively reflecting continued wood deficits. While the picture in Australia, Brazil, Chile, New Zealand, Portugal, South Africa, Spain and Venezuela in relation to supply and demand is quite bright. In these countries tree farms can yield 20-35 cubic meters per hectares per year up to 10 times of the average annual yield form natural stands which can contribute in easing logging pressures on forests. The plantations are so fast growing that they can be harvested in short time. Brazil has to a great extent expanded its plantation are in recent years but domestic need will likely to affect export.

The former Soviet Union, with a fifth of the world's forest area and nearly a quarter of its growing stock is having a large unexploited or unutilized supply potential. While much of the forest in the European North Siberia and the Far East, however, suffers from unfavourable climates and poorly drained soils with low productivity. Malaysia supply the bulk of the world’s tropical logs and their forests are rapidly disappearing. Malaysia’s timber exports brought in a record $3.1 billion in 1989 but this country will have to import in less than a decade.\(^97\) West Africa exports most of its tropical logs to Europe. In 1989 Nigeria earned US $6 million from these exports while spending US $100 million on forests product imports.

\(^{95}\) Postel et al, supra note 89 at 76-77
\(^{96}\) Id. at 77.
\(^{97}\) Id. at 78.
All said and done - forests all over the world are on the vanishing point. Forests everywhere are in great difficulties right from Siberia to Amazonia. Tropical forests are vanishing at the rate of 17 million hectares a year and temperate ones seriously deteriorating by forces of pollution and overharvesting.98 It is aptly said that “acid test whether humanity is up to this challenge may be the fate of forest in the humid tropics - certainly not the only beleaguered forests, but perhaps those whose loss would have the greatest repercussions”.99 Tropical forests are found in more than half of earth’s species. We have to think of an efficient natural forest management policy based on international meets, conventions and agreements. It is reconciling need to preserve the Earth’s remaining forests with the needs of countries to exploit their forests as economic resources is a great challenging task before the international community.

The conflicting interests centred around viz., forests as homes of indigenous people, farmers and ranchers as obstacles in clearing them to provide new lands, loggers to provide them with jobs and source of fuel for cooking for two billion people. To Government leaders, forests are sovereign resources which countries have the right to exploit.

Several efforts worldwide have been made to say forests and their invaluable wealth. Eighth World Forestry Congress held in Jakarta, 1978, FAO Panel of Experts on forest Gene Resources, The International Council for Research in Agro Forestry (ICRAF) at Nairobi, Kenya cooperates with UNEP’s Ecosystems Task Force in planning and coordinating on world wide basis research in combined system of land management for agricultural and forestry are the notable ones.100

**Sustainable Development**

To sustain the forests in order to maintain economic development, people will have to change the way they view forests. Experts point out three phases. In the first, the

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98 see Johnson et al, supra note 93 at VII.
99 Earth Summit in Focus, supra note 89 at 1.
100 Caldwell, supra note 4 at 223.
forest is viewed as an unlimited resource. Its destruction may be promoted by encouraging agricultural expansion. In the second phase, destruction of the forest may cause concern that leads to the institution of controls. In the third phase, attempts are made to recreate the forest.

Tropical countries are facing the challenge regarding productive investments to maintain their forests. Experts advise such investment on sustainable production of timber from natural forests areas - so called “natural forest management”. This approach provides “that tangible goods and services in humid tropical forests can compete with alternative land uses that require forest clearing”. It is also asserted that natural forest management provides no guarantee that forest ecosystems will stay healthy, diverse and without degradation. “Ultimately, the institutions that manage forests determine their fate”. The correct approach seems that “defining sustainability in terms of the continuous yield of timber alone is a trap. The most important test is whether natural forest management conserves tropical forests in areas with high deforestation”.

Concerted efforts are being made to change destructive practices. Parts of Scandinavia, Canada and the erstwhile Soviet Union are carrying out sustainable management. It is encouraging that more than 60 countries have agreed to prepare national forestry programmes under the Tropical Forestry Action Plan, launched in 1985 by FAO.

Recently Bolivia has launched a five year ecologically moratorium, temporarily suspending logging concessions. Guyana has set aside 360,000 hectares of tropical forest for conservation and research. India and Vietnam have launched conservation efforts.

101 Earth in Focus, supra note 89 at 4.
102 Johnson et al, supra note 93 at 1.
103 Id. at 1.
104 Id. at 31.
Forests are not only timber producing areas, they are also a major source of fuels, medicines, household materials and food. They also cater services such as maintaining watersheds, providing a habitat for biological diversity, regulating the climate, and sequestering and releasing carbon. Moreover, they serve as tourism and recreational spots as well as important areas for socio-cultural and religious activities. It is sad that often non-timber values or the forest are forgotten and ignored. It is difficult to calculate all the lost revenues once forestland is set aside as a wilderness area and “this creates a bias in favour of alternative uses for the land”. Albeit this has resulted in some consciousness rising on the part of countries ignoring forests and exploiting forests for timber values.

Brazil has modified its incentives for cattle ranching, which encouraged clearing the Amazon. Germany, the UK and the Netherlands have placed special restrictions and controls on the use and imports of tropical timber, although such regulations have been sharply criticised by some developing countries as unfair trade practices. The “Greenbelt Movement” in Kenya, a women’s organisation has planted millions of trees for food and fodder and raised awareness of the forest issue. It is good that projects like this can help prevent degraded forests from turning into desert. Governments and international organisations have identified sustainable forestry practices as a priority.

Many countries around the world have enacted laws to arrest deforestation and for conservation of forests which have culminated in Agenda 21 of the Earth Summit at Rio.

**Agenda 21 of the Earth Summit - (1992)**

Agenda 21 is a “global soft law” which provides in Chapter 11 the principles cover all forest types and a wide range of associated environment and development issues. The guiding objective of the principles is to contribute to the management, conservation and sustainable development of forests, and to provide for their multiple and

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complimentary functions and uses. The principles also note the need for valuing forests, setting associated standards monitoring them, using environmental impact assessment for forest development, setting aside protected forests, strengthening national and international institutions and also public participation. They meet generally accepted requirements.

**Climate Change and Global Warming**

The natural greenhouse effect of the atmosphere is necessary for sustenance of human life on earth, in the absence of it the average world temperature would be around 18 degrees Celsius. Greenhouse gases permit short-wave heat radiation to the significant extent to the earth’s surface thereby heat and the earth to a temperature currently averaging 15 degree Celsius. In the absence of anthropogenic influences, consequently the biosphere releases roughly the same amount of greenhouse gases (GHGs) into the atmosphere as it absorbs from it. Since the dawn of Industrial Revolution and the large growth in the worlds population, man has been altering the balance in the ecosystem resultantly anthropogenic GHG emissions have increased due to the combustion of fossil fuels. The greenhouse theory reveals that any increase in GHG concentrations will enhance the natural greenhouse effect with an additional anthropogenic emission.

Scientists have warned about the consequences of the “man-made” greenhouse gases effects. They predict that the continuous emission of gases like carbon dioxide (CO2) could result into rise in global mean temperature up to 4 degrees Celsius over the next 100 years.

Is to be emphasised the Carbon dioxides (CO2), halogenated hydrocarbons (particularly chlorofluorocarbons + (CFCs), methane (CH4), nitrous Oxide (N20) Ozone (O) (in the troposphere) and mater vapour (H2O) (in the stratosphere) contribute to the anthropogenic greenhouse effect. In simple terms GHGs include carbon methane, nitrous, CFCs and Ozone etc.107

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106 Dissemination Notes - ENVIRONMENT (The World Bank) 1 (February 1994).
107 Supra note 103 at 7.
GHG emissions are generated by human various activities which have been accumulating in the upper atmosphere. They include combustion of fossil fuels for power supplies and traffic destruction of forests, in agriculture rice growing and animal husbandry, fertilising, rubbish dumps, manufacturing of cement and their effect creating a greenhouse effect. Global consequences could be seriously disastrous. Rising seas levels resulting from melting of the polar ice caps could damage large areas of coastal land flooding such cities as New York, London, Shanghai and Tokyo. Beyond this, rainfall pattern would have different courses - resulting into flood and famine simultaneously in different parts of the world. Plants and animal species would be affected greatly in terms of survival.

Global warming will have varying effects. One scenario foresees a shift in the current agricultural production pattern away from current production ares to more northern latitudes. This may result in to an overall reduction in agricultural yields and could result in serious regional of year to year food shortages. The rise in sea levels linked with a warmer climate will endanger low lying coastal areas, particularly densely populated coastline areas and small island states. Global warming may also produce lots of climate refugees away from the worst affected regions and coasts. The climate impact in majority are associated with a reduction in human wellbeing although some impacts may be beneficial. However, nothing can be said with decisiveness and many impacts will only be know after the lapse of several decades. There may be a catastrophes such as possible melting of the Antarctic ice sheet, resulting into rise in sea level in several meters or a redirection of the Gulf stream, leading - ironically to a cold climate in Northern Europe similar to that of Northern Canada. However, there could be many surprises owing to a combination of absolute global mean temperature and rate of temperature change not known in the world history as far as these changes are concerned. Many damaging aspects have not yet been sufficiently analysed or reviewed so as to arrive at a tangible result and many valuation attempts are rather ad hoc.

108 Dissemination Notes, supra note 105.
109 Id. at 2
The question arises, how to control the global warming? In this regard, researchers in the US, UK and France, investigating marine algae\textsuperscript{110} have theorised that algae, when exposed to high temperature, produce sulphur particles, around which closes form.\textsuperscript{111} The clouds over this, produced as it is estimated, can bring down the earth’s temperature.

The researchers found that algae produces a sulphur compound which seems not only to be a key link in the global sulphur cycle which also influences the formations of clouds, and therefore, the earth’s temperature.

The relationship between algae and climate involves dimethyl sulphide or DMS, the gas that gives sea air its bracing smell. Algae transfers between 20 to 50 million tonnes of sulphur from the oceans to the atmosphere every year. However, in the current efforts to stabilise the climate lowering the production of carbon dioxide is the best way.

**Climate Change Convention**

The 45th UN General Assembly started the official negotiation process on a climate treaty by adopting resolution 45/212 entitled “protection of global climate for present and future generations of making on 21 December, 1990.\textsuperscript{112} Consequently, the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change” (INC) stated that the negotiations for the preparation of an effective framework convention on climate change, containing appropriate commitments, and any legal interments might be agreed upon, should be completed prior to the UNCED. Hence, six meetings of the INC were held during February, 1991 and May, 1992.\textsuperscript{113}

\textsuperscript{110} A major group of lower plants that is often included in Thallophyta that comprises usually photosynthetic plants of extremely varied morphology and physiology and that is now commonly considered to be a heterogeneous assemblage. see Webster’s Third New International Dictionary Vol 1, 52 (1966).

\textsuperscript{111} Rita Ray, “Can Algae Serve as a Global Thermostat?” The Times of India (New Delhi), p. 17, Col. 2 (15 November, 1994).

\textsuperscript{112} see Oburthur, supra note 105 at 7.

\textsuperscript{113} see Oberthur, supra note 105 at 14.
At the Earth Summit, the Climate Convention was signed by more than 150 countries. But it generated problems of combustion of oil and coal is the cause worldwide of carbon dioxide emissions and man's impact on climate. The oil exporting states see any attempt to limit the scale on which these fuels are burnt as a threat to their economies. Saudi Arabia and other oil exporting producers have raised questions about the utility of such Climate Convention hence they did not sign it. The convention is not considered to be perfect. The USA weakened the force of the text by putting a stop to a timetable for freezing emissions greenhouse gases. The Convention is “a major step forward and a platform with potential” said UN Secretary General Boutros Boutros Ghali in a speech prior to its signature.

It is correctly said:

What we are doing is irreversible. Climate change is on. We don’t know what’s tolerable. We do know there’s a delay between increasing greenhouse gas concentrations and climate change, and we know climate changed will be with us for decades, if not centuries.

The planet is already having regional droughts, storms, shortages in water supplies, disruption of fisheries and extinction of many plant and animal species, as global warming changes weather patterns and disrupts and seriously affect natural ecosystems. But the present status of global warming cannot assess of the reaction and interactions of the planet’s land, ocean and ice masses in relation to the rise in temperatures which humans are experiencing.

However, research reveals that the areas covered by northern boreal forests will diminish rapidly, “from a present twenty three percent of the world’s total forested area, to less than one percent. Boreal forests possess more carbon in their soil than do the deciduous forest that will replace them. Resultantly it is estimated that there will

116 Id. at 5.
be an additional boost to atmospheric concentrations of carbon dioxide as the northern boreal forests get vanished. Consequently continuous rise in temperatures will release higher quantities of carbon dioxide and methane.

Mustafa K. Tolba, former UNEP Executive Director said:

The consequences is that it is up to the industrialised nations to take that action first. They started the problem in the first place: they are responsible for three quarters of all man-made carbon dioxide emissions: they have the technological knowledge already available which would allow immediate and substantial reduction in greenhouse gas emissions, and could enable developing nations to do the same. Some 20 nations have already announced plans to stabilise or reduce their emissions but only global action will forestall global catastrophe. It remains to be seen whether the industrialised nations will act in time.\footnote{Id. at 7.}

**Chemistry of Ozone Layer and its Depletion**

In the early 1930s, when CFCs (Chloroflourocarbons) were commercialised, they were considered too good to be true.\footnote{Beatrice Lacoste, Saving our Ozone Shield”, 4 Our Planet, (No 4) (UNEP magazine) 4 (1992).} The most common CFCs are simple chemical structure and cheap to manufacture. They are made up for chlorine, fluorine and carbon atoms. Furthermore, they do not combine easily with other substances. They vaporise at low temperatures CFCs act as ideal coolants in refrigerators and as propellant gases for spray cans containing anything from deodorant to insecticides. CFCs are also excellent for cleaning electrical circuit boards and are used to put the little bubbles in plastic foam material such as styrofoam. In the present day yearly market for CFCs is around US $2.2billion.

In the decade on 1970s, world had realised the depletion of ozone shield by CFCs and halon, gases used in fire extinguishers. The ozone layer was already endangered in huge “hole” over the frozen wastes of Antarctica.
Deterioration in ozone layer results into ultraviolet radiation on the Earth with the result more cases of skin cancer cataracts and immune system damage.\textsuperscript{119} Increased ultraviolet radiation affects also wildlife and their chances of disease become greater.\textsuperscript{120} It may result into potential damage to wildlife, forests and marine plankton. It also damages crops and trees, preventing their growth and endangering germination rates. The world's rice harvest could be affected seriously as well. In rice paddies excessive radiation greatly slows the activity of bacteria in the soil which supply natural nitrogen fertiliser for rice crops. For every 1 percent decrease in ozone overhead, you get roughly a 2 percent increase in the incidence of skin cancer says Harvard University atmospheric chemist James Anderson. The EPA predicted that expected ozone losses could result into 12 million additional cases of skin cancer and 200,000 deaths in this century over the next 50 years. These estimates were for 1991 before more gloomy picture emerged.

Actually the general public was not aware of the ozone shield what is total of threat of CFCs to atmosphere. Human experience about ozone was a tonic component of smog hanging over crowded cities. However, ozone shield mounted in the upper atmosphere performs a life sustaining role, protecting plant and animal life from excessive exposure to highly dangerous ultra violet light (UV).\textsuperscript{121} At the upper reaches of earth's atmosphere, under intense ultra violet light (UV) penetration from the sun molecules of oxygen (O) are split into single atoms. Ozone is dispersed throughout the stratosphere (15-50 km above the earth's surface), preventing most of the sun's dangerous ultraviolet rays from reaching the surface 20 to 50 km below. Ozone exists in such microscopic quantities, especially over the oceans, that if it were at sea level air pressure it would be as thin as a pane of window glass.

Ozone thinning, already severe over Australia, is also measurable over the northern hemisphere, studies conducted in the USA by National Academy of Sciences have reported that the continued release of chlorofluorocarbons (CFCs) - could lead to an

\begin{itemize}
\item[\textsuperscript{119}] A Nadis and Mackenzie, "Car Trouble" (World Resources Institute, Washington D.C. Guide to Environments) 28 (1993).
\item[\textsuperscript{120}] Ozone Crisis, Leaflet "Greenpeace" (NGO, the Netherlands).
\item[\textsuperscript{121}] B. Lacoste, supra note 118 at 4.
\end{itemize}
average warming of the earth's surface by a few tenths of one degree Celsius before the middle of the next century.\textsuperscript{122} It will also effect changes in the temperature of the stratosphere which ultimately affects ozone chemistry.\textsuperscript{123}

CFCs and HCFCs are used in airconditioners, refrigerators, foams, aerosols and industrial solvents.\textsuperscript{124} In the upper atmosphere these chemicals break down thus releasing chlorine which then attacks the ozone layer. One Chlorine molecule can destroy 100,000 ozone molecules. CFCs and other ozone eaters stay in the atmosphere for many decades and because chemical companies have already produced hundreds of millions of tonnes of these chemicals, the world is witnessing ozone depletion helplessly. The sooner companies like Du Pont stop producing these chemicals, the sooner the ozone layer will be able to start healing itself. In this regard, Greenpeace led a campaign against Du Pont and successfully stopped a trainload of chemicals from entering the Du Pont plant in Dordrecht, Netherlands in protest at its continuous production of CFCs, HCFCs activists handcuffed and chained themselves to the train and to the trucks. Du Pont is the largest producer of ozone destroying CFCs in the world.

In 1977 the United States acted under the Clean Air Act Amendments to restrict the use of aerosols containing CFCs.\textsuperscript{125} In 1980 the Governing Council of UNEP under its Executive Director, Mustafa Tolba asked all governments to reduce the production and use of CFCs.\textsuperscript{126} Due to the keen interest of UNEP, the Vienna Convention for Protection of Ozone Layer was signed by representatives of twenty countries in March 22, 1985. The Vienna Convention was the first attempt towards international problem including information exchanged, monitoring and research. Resultantly, serious negotiations continued and on September 16, 1987 twenty eight nations signed the Montreal protocol on substances that Deplete the Ozone Layer.

\textsuperscript{122} Caldwell, supra note 4 at 262.
\textsuperscript{123} Id. At 263.
\textsuperscript{124} Supra note 120.
\textsuperscript{125} Calwell, supra note 4 at 262.
\textsuperscript{126} Id. at 263.
However, a schedule relating to progressive phase out of CFCs to the tune of 50% was agreed upon which was a healthy development towards advancement in the international environment policy. But within four months Montreal protocol became out of date and unacceptable to a growing number of nations. In June, 1990 in London parties to the Montreal Protocol agreed to a 100 percent ban for developed nations by 2000 AD with a margin of 10 year time to developing nations.\textsuperscript{127} In another development in Finland in the spring of 1989 representatives of eighty one nations adopted by consensus the “Helsinki Declaration” on the Protection of the Ozone Layer (2 May, 1989) recommended for a total phase out of production and consumption of CFCs by the year 2000.\textsuperscript{128}

According to a UN report published in 1991:

These developments led to a “new and more comprehensive relative costs assessment of compliance or non compliance by the EPA.\textsuperscript{129} The EPA estimated that the US costs of compliance between the years 1989 and 2075 would be $29 billion and $349 trillion.\textsuperscript{130} The EPA cost assessment was very influential, particularly in the European Community.\textsuperscript{131}

However, India, China, Mexico and Brazil had previously stated that they would not cut CFCs production without some type of financial assistance from developed countries. But in June, 1990, at the London meeting of the signatories of the protocol, both India and China signed the agreement after the assurance of that developed countries would create a special fund of $160 million (with an additional $80 million specially set aside for signatories to the agreement) to help the developing countries gain the technology necessary to develop and utilise controlled substance substitutes.\textsuperscript{132}

\textsuperscript{127} B. Lacoste, supra note 118 at 5.
\textsuperscript{128} Caldwell, supra note 4 at 263
\textsuperscript{130} Ibid. See also Environmental Protection Agency (EPA) proposed rule on the Stratospheric Ozone, 25 Fed. Reg. 47 489 (1987) (Codified at 40 CFCs s.82)
\textsuperscript{132} Nanda, supra note 129 at 33. See also 13 Int'l. Env. Rep. (BNA) (July 11, 1990).
Agenda 21 of the Earth Summit in Ch. 9 part c which relates to preventing stratospheric Ozone depletion in the last paragraph recommend as under:

Replace CFCs and other ozone depleting substance, consistent with the Montreal protocol, recognising that a replacement’s suitability should be evaluated holistically and not simply based on its contribution to solving one atmospheric or environmental problems.

Effects on People and Life

The effects of ozone depletion on the people are quite alarming. Increase in skin cancer rates are occurring. In New Zealand, where the effects of the Antarctic ozone hole have been felt since 1985. The rates of cancers (melanomas) have increased 74 percent in the past decade.

In the USA, the Environmental Protection Agency has estimated that 12 million people will develop skin cancer and 200,000 will die over the next fifty years, as a result of ozone thinning. These estimates or forecasts are based on conservative assumptions about pattern or rate of ozone depletion. Ozone depletion has also resulted into blinding cataracts. Increasing amounts of dangerous radiation from the sun are now reaching the Earths surface threatening all forms of life. However, the ozone depletion is affecting in one form or the other plants, fish, animals and people. Besides resulting skin cancers and blindness, it affects the body’s ability to resist and fight infectious diseases and vaccination programmes could be nullified in no time. Damage done due to ozone depletion will not be healable soon as it requires nearly a century to do so. The present and future generations will have to face this problem where sunlight radiation could be highly dangerous and very harmful. In spite of the fact that companies are still engaged in the production of over one million tonnes of ozone destroying chemicals each year. Greenpeace is campaigning to force the biggest producers notable Du Pont to stop producing dangerous chemicals such as CFCs and their dangerous substitutes called HCFCs and HFCs.

See leaflet supra note 120.
The ozone layer exists only 8 miles or 14 kilometres above the earth. It acts as a shield to life on earth from lethal radiation transmitted from the sun. The same shield is getting thin at an alarming speed. Prediction on ozone depletion continues to go wrong as the scientists did not forecast the formation of the Antarctic ozone hole. Depletion over highly populated pacts of the Northern Hemisphere over the last decade revealed more than two times bad as the scientists had expected. It was discovered in 1992 20 percent depletion of the ozone layer over the Arctic and 10-15 percent above North America and Europe which was beyond expectation.

Greenpeace (a NGO) is pursuing educative and eco friendly programme and technology. In this regard Greenfreeze is a revolutionary CFC free technology that Greenpeace is promoting as part of its worldwide campaign to save the ozone layer and slow global warming. Greenpeace assisted an East German fridge manufacturer on the brink of collapse to promote and develop the new GREENFREEZE fridge due to the opposition from scientists and industrialists. This kind of development will help in improving the situation in relation to destruction of the ozone layer and this help environmental consumerism.

Wildlife

Decent conservation laws and ample nature reserves in such countries protecting large natural areas will be possible if socio economic problems of the people in the developing countries are resolved. As an American conservationist Aldo Leopold said that “Wild things .... Had little human value until mechanisation assured us of a good breakfast.” As long as large numbers of people remain poor “nature will be in jeopardy”. It is a bitter truth that international trade in wildlife mostly clandestine is now estimated to be around $20 billion annually. It is seemed only to narcotics and equal to that in armaments. My own country India has emerged as one of the major

136 Rajat Pandit, “A Bird in the Hand is Worth a Drug Haul”, The Times of India (Delhi times), P. 1 (29 November, 1994).
137 A.H. Zaidi, “Move to Check Wildlife Trafficking”, The times of India (New Delhi) p. 3 cols 6-7 (15 August, 1994)
sources of supply of the illegal wildlife trade being as it is home to 60 percent of the world's tiger population, 50 percent of Asian elephants and 80 percent of one-horned rhinoceroses besides a variety of other flora and fauna found in abundance in different parts of India. Trafficking in birds forms a significant part of this clandestine trade. Man's demand for exotic pets and the consequent massive rise in profit for traders have fuelled the surge in bird smuggling in recent times. There are several birds which are on the brink of extinction. Investigations reveal that falcons too are being smuggled out of India. “A rare variety costs about Rs. 10,000 (US $300) in India, but fetches more than Rs. 5,000,00 (over US $17000). Asiatic Cheetahs are on the brink of extinction.

Present socio-economic trends endanger the specular wildlife of the East African Savannas - the Zebra's, elephants and lions that attract Africa’s biological richness to many. There is eminent threats posed by ivory and skin poachers but more threat to African wildlife is continuous loss of habitat to human settlements.

In 1993, the officials seized tiger bones to the tune of 760Kg up to July 1994 - 45 freshly killed tigers and leopard skins were made available a Report says in India.

Among the other endangered species under threat from illegal trade in the rhino. During 1992, the death toll from poaching was running at one rhino per week and in early 1993 rose to 1.8 per week. In snake skin, in 1994 an under cover study reported the availability of 400,000 snake skins annually from the Madras city alone. In the first six months on 1994, over 60,000 snake skins had been seized in the country.

Expensiveness of wildlife products can be judged as a single rhino horn fetches US$15-17 thousand in Assam India. The ultimate price which the consumer pays is of course much higher. The International price of musk in US $45,000 per kg and oil distilled

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138 Id. at col. 1
139 Asiatic Cheetahs on the Brink of Extinction, The Hindustan Times (Sunday) p. 29 (27 November, 1994).
140 see Zaidi, supra note 137 at 3.
141 Eckholm, supra note 135 at 193.
142 The Times of India (New Delhi) p. 3, cols 607 (15 August, 1994)
from agarwood retails at trice that of pure gold. The Indian Wildlife (protection) Act, 1973 was amended in 1991 which more or less banned hunting and trade in wild fauna and their derivatives. Yet large quantities of valuable wild species are still being smuggled due to lack of strict enforcement of the Act and legal flaws, corruption and lack of awareness.

Plants or animals endangered by hunters, collectors or fur and ivory trades or poachers can only be protected on a species to species basis if persistent efforts are made at governmental and non-governmental levels. National governments have greater responsibilities for controlling illegal and ruthless exploitation of wildlife. In fact, the convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) which came into effect in 1975 is a good start and a powerful weapon in dealing with harmful hunting and collecting. The convention has been signed by about seventy countries and prohibits or regulates trade in live specimens and product derivatives of listed plants and animals. The national which have not signed are Austria, Belgium, the Netherlands, Singapore, Spain and Yemen and species exporters such as Mexico, Sudan and Thailand.

There is a way against the ivory trade and hence 1989 Session of the Convention on International Trade in Endangered Species (CITES) held in Lausanne, Switzerland dominated the talk on the future of elephants in Africa. It is said - “where once the elephant roamed over nearly the whole of Africa, today it is restricted to only a third of Africa’s land area, its numbers are thought to have reduced to just over 600,000 killed by thousands for its tusks”. The trade in ivory has threatened the species on the whole. The international ivory trade has been estimated to the tune of US $1 billion a year including in its legal and illegal transactions. There is also the thorny question of the impact of a reduced flow of ivory on the domestic economies of the ivory processing locations, Japan in particular. There is vigorous crack down on poaching by Kenya and

143 see Eckholm, supra note 135 at 193.
144 Id. at 194.
145 Nanyi Albuero, The War Against the Ivory Trade, 1 Our Plant (UNEP, Nairobi, Kenya), No. 4, p. 8 (1989).
Tanzania. Some illegal trade from poached elephants is certain to continue as some countries which choose not to impose the ban. Kenya in July 1989 destroyed 2000 elephant tusks worth US $3 million to set an example to the world by not exporting them.

In the US “the Endangered Species Act (ESA) 1973 was enacted to identify and to conserve plant and animal species threatened with extinction.” It defines species to include “any subspecies of fish or wildlife or plants and any distinct population segment of any species... which interbreeds when mature”. The Secretaries of the Interior and commerce share responsibility for the Act’s implementation. As a practical matter, it is Interior’s Fish and Wildlife Service and commerce’s National Marine Fisheries Service which administer and interpret the Act. The Endangered Species Act, 1973 is the outcome of the environmental consciousness that swept the US in the late 1960’s and early 1970’s. Two predecessor laws, “the Endangered Species Preservation Act, 1966” and the Endangered Species Conservation Act, 1969” afforded threatened wildlife a comprehensive scheme to protect and encourage the recovery of endangered species. Hence, a new law in 1973 was passed by the US Congress.

The ESA directs the Secretaries to determine on the basis of scientific evidence alone, whether any species or plant or animal is endangered or threatened. Any person or organisation may petition “the Fish and Wildlife Service” or “The National Marine Fisheries Service” to list a species as endangered or threatened.

The listing of a species limits activities that could harm the species or its habitat. The ESA prohibits the “taking” of a listed species. In this regard “taking” includes

146 Id. at 9.
149 Hill, supra note 147 at 241.
150 Id. at 241 16 U.S.C.S. 1533(b).
151 Ibid. see 16 USC s 1533 (8) (d).
152 Ibid. 16 USCS 1533 ©-(d).
153 Ibid. see 16 USC 1538 (a) (I) ©
harming, harassing, hunting, shooting, killing, trapping, capturing and collecting. The Act also provides for “critical habitat for the species. Critical habitat is the geographic area deemed crucial to the continued viability of an endangered species. Once an area has been designated as a critical habitat federal action may prohibit these areas. Designation of critical habitat is an effective conservation tool but can be extremely controversial because of the potential economic consequences. Besides the Act requires that authorities must develop and implement a recovery plan to reverse the decline. In this regard the Florida Panther (a medium sized, dark, tawny cat with less than fifty representatives left in the wild) is probably the most endangered animal in the US and as the situation prevails at present it cannot be saved. In the US in 1992 federal budget allocated 50.5 million for the management and protection of more than 650 endangered and threatened species.

Tiger - The King of the Jungle

Today the Indian Tiger is vanishing fast for which reasons are its shrinking habitat and uncontrolled poaching for commercial uses. So is the case the world over for similar reasons. Tigers range countries include Nepal, Bangladesh, Burma, Thailand, Malaysia, Laos, Cambodia, Vietnam and Russia. There are an estimated 4500 to 7700 tigers left on the globe the number is not definite as no tiger census is available of the 14 tiger countries. Even India, Nepal and Malaysia do not have authentic information due to mobility and secretiveness of the tiger in spite of scientific census has been carried out but nearly two thirds of the worlds surviving tigers live in India. The latest census will put the tiger population at around 3800 if all had gone well with Project Tiger, India should have around 6000 tigers today.

154 Ibid. see 16 USC s 1532 (19).
155 Ibid. see 16 USC s 1533 (b)(2).
156 Ibid. see 16 USC s 1532 (5)(a)(I).
158 See Hill, supra note 147 at 242.
159 Id. at 263.
161 India to Chair Global Tiger Meet, The Times of India (New Delhi) p. IV (1 September, 1993).
162 Kapoor, supra note 160 at Col. 5.
163 Id. at col. 6.
The Director of Project Tiger, India, says where is the habitat of 6000 tigers? Interestingly, the world over, the habitat of the tiger also supports the world's most dense human population says the UK based Global Tiger Patrol. It estimates that nearly 59 percent of the world's population competes with tiger for space in the tiger range countries. The tiger region is deforested today at a rate of around 4.7 million hectares each year an area about 1.25 times larger than that of Taiwan. While the local human populations are making greater inroads into the forests for agriculture and their forests based needs, much of depletion is due to commercial interests. Poaching too works for urban and commercial interests. In many countries in which the tiger still roams wild, there is growing evidence of links between local poachers and wealthy entrepreneurs in Taiwan, South Korea, Japan and Europe. In Taiwan, the wealthy eat tiger stew and tiger penis soup (sold for $320 a bowl).\textsuperscript{164} A beautiful tiger skin may bring its sellers as much as US $15,000 but the bones and other body part generate even more money and they are much easier to smuggle and peddle. As incomes rise in Asia, people can afford to pay tens or hundreds of dollars for a dose of tiger based medicine.\textsuperscript{165} As incomes increase in Asia, the tiger plight reveals the limits of conservation efforts and raises disturbing questions about humans' ability to share planet with other animals. It is believed that the volume of actual trade in tiger skins and other parts may be at least six times higher than what comes to light.\textsuperscript{166} Amazingly, the part wise break up of tiger is as follows\textsuperscript{167}

It is the job of an expert to know tiger bones and most of the trade borders are not fool proof. While the tiger in India may become extinct species which the world enjoyed very much. Demand for oriental medicines made from tiger bones encourages poaching and threatens the world's remaining sub species of tiger with extinction within five years according to environmentalists.\textsuperscript{168} Unless, drastic steps are taken in the next few years to curb the illegal trade of tiger bone and products, the only place people will

\textsuperscript{164} Id. at col. 7.
\textsuperscript{165} "Tiger on the Brink", \textit{Time} (US magazine) 34, 37 (28 March, 1994).
\textsuperscript{166} Kapoor, supra note 160 at col. 7.
\textsuperscript{167} Manoj Bhatnagar, Doomed, \textit{The Hindustan Times} (Sunday) p. 2 (9 October, 1994)(Reproduced).
\textsuperscript{168} \textit{The Times of India} (New Delhi), p. 8 (13 July, 1994).
be able to see these beautiful cats will be in places like museums and zoos. The most immediate threat to tigers today is oriental medicine trade. It is estimated that 600 tigers are required every year by the Chinese pharmaceutical industry. The India's National Wildlife Action Plan is a plan of protection of habitats. The forests conserved under the Indian Forest Act provides some habitat for wildlife. Some uses of the forest authorise under the Indian Forest Act may disturb or degrade wildlife habitat.\textsuperscript{169} The wildlife Act provides for the establishment of national parks and sanctuaries to ensure greater protection for wildlife. India is only one of two countries (apart from Denmark) to ratify the major international conventions relating to wildlife. They include specifically “Convention on International trade in Endangered Species of Wild Fauna and Flora, 1973 (CITES)”, “the Ramsar Convention on Wetlands of International Importance”, “the Migratory Species of Wildlife Animals Convention and the Whaling Convention”.

It is difficult to solve the problems as both endangered species tigers and ethical rights to survive. In such situations what role law can play is not easy to carve out.\textsuperscript{170} “Saving tigers means saving nearly everything that lives under the umbrella of the forest including the forest itself”.\textsuperscript{171} This will prevent soil erosion, increase in agricultural activity, catch water and conserve both above ground and underground water supplies and innumerable kinds of natural balances considered to be very necessary for the people at large. Preservation of bio diversity is linked with the preservation of forests and their wealth, wildlife and plants. Pharmaceutical’s, pesticides and all other things are very much essential for the survival of mankind. In essence the tiger is the backbone to maintain the balance which accordingly cannot be jeopardised.

Wildlife conservation consciousness and information around the world is very essential. “The IUCN has issued a new edition of its “Red List of Threatened Animals” a compilation of 5929 species known or believed to be endangered in the

\textsuperscript{170} Id. at 235.
\textsuperscript{171} Aditi Kapoor, supra note 160 at col. 2.
According to the list, about 16 percent of known mammal species, about 10 percent of birds and 4 percent of fishes are considered threatened. Red List cites Indonesia, Brazil, India and China among the countries with the most threatened mammals and birds but note these are large ecologically diverse countries with many species in the better studied categories. It is also interesting to know in spite of the planet had animals with longest lives which one could think of. In this regard record holding is the artic calm, one of which lived quietly underwater for some 220 years. If you insist on better documentation, the oldest animal ever was a Marion’s Tortoise that died on the Island of Mauritius on 1918. The reptile had been captured - already full grown - in the Seychelles in 1766, nine years before the American Revolution began and it died 152 years later as World War I came to a close.

Human sensitivity to wildlife is sometimes spectacular as the famous actress Sophia Loren got a caustic and open letter from another famous actress Brigitte Badot who show hatred for the fur industry. Sophia Loren signed a promotional contract with a large Italian fur coat company, “Annabella”, to model for an advertisement, in Italian newspapers and magazines. Bardot, a former film sex symbol and France’s prominent animal rights advocate wrote to Loren that she finds it “degrading, repugnant, lamentable and unworthy to accept money stained with the blood of animals”, “even if you need it”. American and Italian animal rights groups have also protested Loren’s modelling of furs. The fur company had already warned Loren about the public protest at large.

There is a growing feeling that animals are also entitled to legal rights like human beings. “When we can confer rights on inanimate objects like companies, ‘religious paths’ (Sanctuary) deities, trusts etc. then why can’t we confer rights on other

173 “What Animals have the shortest and longest lives”, National Wildlife, (National Wildlife Federation, USA) 57 (April-May, 1994).
species". It is forcefully argued that once legal rights are conferred to the animals it would become the obligation of the state to protect them. Protection to animals would flow directly from the rights of the animals rather than indirectly and condescendingly from man. Car is considered to be the biggest offender of the environment. All kinds of transport except electric railways are driven by fossil fuels. When engines burn these fuels, carbon dioxide is formed. That is a chemical law and the amount of CO2 produced is directly proportional to the amount of fuel used to drive the engine. Any increase in the levels of CO2 in the atmosphere are one of the key causes for reinforcement of the greenhouse effect, which ultimately results in changes in the weather patterns of the earth.

Automobile

Emission from cars, trucks and buses are both a local concern and problem of global dimensions. It is estimated that there are half a billion motor vehicles on the world's roads, the potential now exists for irrevocably altering the composition of the atmosphere thus changing the climate of the entire planet.

Globally, motor vehicles produce 14 percent of carbon dioxide given off in fossil fuel combustion. In USA 25 percent of the carbon dioxide emission produced from 190 million cars, truck and buses. Globally, over 90 percent of all man made carbon monoxide comes from transportation sources and in this regard industrialised nations account for 75 percent of the total. Global Carbon dioxide concentrations have grown by 25 percent since the industrial revolution began, with half of this increase has taken place in last three decades. If effective counter measures are not taken, the concentration of greenhouse gases in the atmosphere could double by the year 2030 in comparison to the levels of pre industrial era. Although in the US automakers spend
efficient, safe and affordable vehicles that the Clinton Administration wants to develop for the 21st Century.\textsuperscript{181}

The total effect of the world's half billion vehicles add up to a strikingly different picture than the pastoral vision in advertisements for the Infiniti\textsuperscript{182}. Instead of maintaining necessary harmony with the environment, "cars are among nature's chief adversaries".\textsuperscript{183} However, cars play a dominant role on our lives as a most superior servant. We have designed our cities and towns in such a way that cars have become inevitable entities and less regard for other things due to operative compulsive forces. Larges tracts of urban areas have been covered into a dense web of underpasses, overpasses, ramps, turnpikes and interchanges - a nightmare for pedestrians cyclists and even motorists.\textsuperscript{183} We have paid a heavy price to roam at will at the turn of a switch is becoming increasingly painful. Car dominated transportation systems disclose environmental, economic and safety problems at every step - from the extraction of crude oil from the ground to the burning of carbon based fuels that jam our city streets. Above all, it is a grave threat of altering the composition of our atmosphere and resultantly resetting of the earth's thermostat.

It is interesting that the USA is the biggest consumer of automobile and number of motor vehicles registered is 190 million. Americans drive their cars, trucks, vans and buses over two trillion miles annually - enough to take us to the sun and back more than 10,000 times and as many miles as the rest of the world combined.\textsuperscript{184} With only 5 percent of the earth's population, US own 34 percent of the total cars and use 26 percent of the world's oil. Automobiles kill every year on the USA roads and highways about 47000 people. Cars are considered as enormous consumers of the earth's resources resulting in the reckless consumption of 20 percent of all the steel, 12 percent of the aluminium, 10 percent of the copper, 5 percent of the lead, 95 percent of the nickel, 35 percent of the zinc and 6 percent of the rubber used in the USA. "As a

\textsuperscript{181} Driving Into the 21st Century. 35 Span (US Magazine) 22 (October, 1994).
\textsuperscript{182} Supra note 179 at 15.
\textsuperscript{183} Id. at 15.
\textsuperscript{184} Id. at 16
consumer in the history of the world”, it is estimated and alarmingly said that:

Here is a machine costing thousands of dollars, intentionally designed to be replaced every 36 to 48 months. Between 1900 and 1984, some 647,507,000 automobiles, trucks and buses were junked in the US alone. Eleven million cars are retired annually in the United States, many left to sit in junkyards, abandoned lots, or roadsides. In addition 240 million tyres are junked each year, joining the 2 to 3 billion already piled up in heaps across the nations, where they pose fire and air pollution hazards and serve as a breeding ground to mosquitoes.\(^{185}\)

To solve vehicles environmental problems the USA has a number of laws Viz., Clean Air Act (Amendments, 1970 (gave Federal government more powers to regulate sources of pollution); Energy policy and Conservation Act (set Corporate Average fuel efficiency standards at 18 mpg beginning in 1978), Clean Air Amendments Act, 1977 (Mandated a 96 percent reduction hydrocarbons and carbon monoxide and a 75 percent reduction in nitrogen oxides from cars; Energy Tax Act, 1978 (established “gas guzzles tax” to be imposed on inefficient vehicles); National Energy Conservation Policy Act, 1978 (doubled the penalty on car manufacturers who failed to meet CAFÉ Corporate Average Fuel Efficiency) standard. Tax Bill (set $0.50 per barrel tax on oil to fund oil spill compensation plan) and Clean Air (amendments)Act, 1990 (required car sold in 1994 and after to have 30 percent lower hydrocarbon emission and 60 percent lower emission of oxides of nitrogen cars sold earlier, required cars will have to pass emissions control tests up to 100,000 miles (Previous limit 50,000 miles).\(^{186}\)

In Sweden, road transport is responsible for over 50 percent of air pollutant emissions, Half the nitrogen oxides, more than half the hydrocarbons, just under a third of the carbon dioxide and almost all the carbon monoxide emitted from exhaust pipes.\(^{187}\)

A large number of zero emission vehicles are introduced in the USA oil consumption, air pollution and greenhouse gas emission will drop. Yet the power plants used to recharge the batteries or produce the hydrogen will still emit some pollution, and

\(^{185}\) See Jeremy Rifkin, Biosphere Politics, quoted in Nadis and Mackenzie, supra note 493 at 11.

\(^{186}\) Id. at 181-182.

decision-makers need at least some estimates of security and air-quality impacts and the global warming benefits that could be realised by banning a shift to electrically powered vehicles.\textsuperscript{188} It is to be seen how far these vehicles will protect the earth’s climate.

**The Persian Gulf Conflict and Environmental Extinction**

The world witnessed the Gulf War from January 17 to February, 1991 unprecedented in human history. The world also witnessed realities of modern warfare in the tiny zone in the Persian Gulf through television and millions of people around the globe were flabbergasted. Authorities feverishly recorded and reported causalities, property damage, fluctuations in world economics sinister threats emerged in the waters of the gulf and skies above Kuwait.\textsuperscript{189} An on sight reported described: the whole scenario as a “Man Made Hell”.

\begin{quote}
(A) desert paradise that has suddenly been transformed into an environmental inferno. Across the land hundreds of orange fireballs roar like dragons, blasting sulfurous clouds high into the air. Soot falls like gritty snowflakes, streaking windshields and staining clothes. From the overcast skies drips a greats black rain, while sheets of gooey oil slap against a polluted shore.\textsuperscript{190}
\end{quote}

Day had been turned into night. So thick was the canopy of smoke as the nation’s oil well burned gold and orange along the black fringed horizon.\textsuperscript{190} The United Nations Environment Programme (UNEP) issued the following caution:

\begin{quote}
What is being destroyed today - and the damage which has been and could be caused could stay with us all of us with - all of us - for a very long time. It will affect generations to come which have had no say in the matter.\textsuperscript{191}
\end{quote}

\textsuperscript{188} James J. Mackenzie, “the Keys to the Care - Electric and Hydrogen Vehicles for the 21\textsuperscript{st} Century” (World Resources Institute) 81 (1994).
\textsuperscript{190} Phillip E Dewitt, A Man Made Hell on Earth, \textit{Time} (U.S. Magazine) at 36 (March 18, 1991)
\textsuperscript{191} Robert Fisk, :Crisis in the Gulf; Something Evil has visited Kuwait City” The Independent, at p. 1 (February 28, 1991).
The Persian Gulf conflict brought about the “marriage” of war and environmental damage and the “birth” of a new menace which is called a deliberate wartime destruction of the environment.\textsuperscript{192} An expert said that:

The Gulf war was the first conflict in which ecoterrorism played a major role in a combatant’s battle plan, and even though the fighting lasted only \textit{42 days}, it may turn out to be the most ecologically destructive conflict in the history of warfare. Experts are still sorting out the effects on the air, land and sea, some of which may persist for generations to come.\textsuperscript{193}

In this regard what is the liability, if any, for the deliberate wartime environmental destruction.

International Environment Law (IEL) is a new and emerging legal regime in relation to fast industrial growth, expanding transportation, the population explosion and the use of highly noxious substances are responsible for environmental damage in one form or the other.\textsuperscript{194} International environmental law has developed in response to a series of environmental accidents in different parts of the world. They are Torrey Canyon disaster in 1967, Amco Cadiz Collision in 1978, Bhopal Gas leak disaster in 1984 and the Chernobyl explosion in 1986 all prompted the development of international environmental law. No IEL is dealing with deliberate or vindictive environmental pollution such as the pumping of oil into the sea or the ignition of oil well fires during the Persian Gulf conflict.

With regard to state responsibility for environmental destruction, general principles emerged in 1941 in the Trail Smelter Case directly concerned with injuries to the state of Washington by sulphur dioxide emission from a smelter plant in British Columbia in Canada. The Special Arbitration Tribunal examined many USA Supreme Court decisions and arrived at the following principle:

\textsuperscript{192} UNEP, Gulf War Oil Spill: UNEP Appeals for International Action
\textsuperscript{193} See P. Elmer Dewitt, supra note 520 at 37.
\textsuperscript{194} See Leibler, supra note 189 at 69.
No state has the right to use or permit the use of the territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein then the case is of serious consequences and the injury is established by clear and convincing evidence.\textsuperscript{195}

Thus, the tribunal held that Canada was responsible in international law for the conduct of the Trail Smelter and was duty bound to see that the conduct should be in conformity with the obligation of the Dominion under international law.\textsuperscript{196} The tribunal ordered reparation by way of injunctive relief\textsuperscript{197} and the payment of an indemnity.

This Trail Smelter Case dominated the scene for thirty years for environmental damage and Principle 21 of the 1972 Stockholm Declaration of the UN on the Human Environment also reiterated and confirmed that the states have the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other states or of areas beyond the limits of national jurisdiction. Although declaration is not legally binding. Principle 21 is the outcome of the constant international judicial development and universally recognised as a statement of customary international law.\textsuperscript{198}

The International Law Commission (ILC) in its draft articles on “International Liability for Injurious Consequences Arising out of Acts not Prohibited by International Law” also emphasised well on the onward development of the general principle of responsibility of environmental damage. The Rio Declaration reaffirmed in the preamble the Declaration of the Stockholm Conference on Human Environment of 1972 in order to build equitable global partnerships, work towards international agreements and recognise the integral and interdependent nature of the “Earth Our Home”.\textsuperscript{199} Then the crucial question arises what should be the nature and quantum of damage.\textsuperscript{200} The nature of environmental damage is in other words, pollution. Several

\textsuperscript{195} Id. at 70. See the Trail Smelter Case (United States V. Canada) 3 R Int’l A&B Award at 1965 (1938 and 1941)

\textsuperscript{196} Id. at 1966.

\textsuperscript{197} Supra note 190 at 70.

\textsuperscript{198} Id. at 71 and see also “International Law Commission Report” 171, 175 (1984).

\textsuperscript{199} see Annex I, Rio Declaration on Environment and Development vol. 1 p. 8 (1992).

information instruments define pollutions as “any introduction by man, directly or indirectly, of substance or energy into the environment resulting in deleterious effects of such a nature as to endanger human health, harm living resources and ecosystems, impair amenities or interfere with other legitimate uses of the environment.\(^1\)

Moreover, if pollution is caused by substances highly dangerous to human life and health. The tribunal in the Train Smelter Case held that all times the state is to prevent environmental damage and no state has the right to do environmental damage.\(^2\)

The permanent Court of International Justice also emphasised that reparation must wipe out all the consequences of illegal acts and this “Principle should serve to determine the compensation due for an act of international law”.\(^3\) During the last half of the century particularly the two World Wars and the technological revolution have drastically changed the international relations. The traditional framework of state responsibility has passed through many adjustments.\(^4\) In the Barcelona Traction Case, the International Court of Justice suggested that certain obligations called “erga omnes” affect the interests of all states hence any state (irrespective of whether specifically injured or not) has jurisdiction to invoke the responsibility of the offending state.\(^5\)

The Trail Smelter Case and the Stockholm Declaration expressly emphasise the prohibition over the destruction of nature in broad terms but do not in any way preclude its application in the context of or in relation to hostilities.\(^6\) But the “World Charter for Nature” in paragraph five strongly resolved that “nature shall be secured against degradation caused by warfare or other hostile activities”.\(^7\) However, the UN General Assembly Resolution is not essentially or inherently binding. Hence, it can be concluded on the basis of Trial Smelter Case, Stockholm Declaration and its

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\(^1\) See supra note 190 at 72.
\(^2\) Id. at 73.
\(^3\) The Factory of Chorzow, (German Vs. Poland) 1928 PCIJ Ser. A. No. 17, at 47 (September 13, 1928).
\(^4\) Supra note 190 at 75.
\(^5\) Barcelona Traction, Light and Power Co. (Second Phase) (Belgium Vs. Spain) 1979 ICJ Rep. 3 (Judgement of Feb. 5)
\(^6\) supra note 109 at 75.
\(^7\) Over 100 State Support the Resolution. The only dissenter was the USA. GA Res. 37/7, 37 UN GAOR Supp (No.51), UN Doc. A/RES/37/7 (1982), reprinted in 22 ILM 456 (1983) quoted in supra note 518 at 75 (f.n.).
reaffirmation in the Rio-Declaration of 1992 that the general principle of state responsibility for enumerated damage is applicable in wartime.\textsuperscript{208}

A state may invoke in the special circumstances in the self defence of violation of the general principle prohibiting environmental damage particularly in the situation of distress or necessity. An offending state must prove or demonstrate that the environmental damage was caused in the course of lawful self defence. Environmental destruction was only a means of saving lives or distress and only means of safeguarding an essential state interest.\textsuperscript{209}

On January 19, 1991 two days after the commencement of hostilities, a giant oil slick began to form in the Persian Gulf off the Kuwait Coast.\textsuperscript{210} It is said that:

The slick killed an estimated twenty to thirty thousand sea birds.......
Small numbers of turtles and sea snakes seem to have died by being smothered from oil. First mortalities have been fairly localised to shrimps and crabs which have died in very large numbers... within the impacted area most of the salt marshes and all of the mangroves have been oiled. It is likely that all of the mangroves and virtually all of the salt marshes will die.\textsuperscript{211}

In terms of the future, Australian marine biologists are very pessimistic as “Gulf-habitats once they have become contaminated by oil it will not be possible to clean up.”\textsuperscript{212} The newest victims of the Gulf conflict wear no dog tags, carry no proof or nationality espouse no conviction that, God or justice or history is on their side.\textsuperscript{213}

Nevertheless, the environmental victimisation is actually capable of bringing about the end of humanity and death of our planet.\textsuperscript{214} Former US President George Bush said “we have in the past year made great progress in ending the long era of conflict and

\textsuperscript{208} supra note 109 at 75.
\textsuperscript{209} Supra note 109 at 77.
\textsuperscript{210} Id. at 126.
\textsuperscript{211} Id. at 127.
\textsuperscript{212} Id. at 127.
\textsuperscript{214} Id. at 137.
cold war. We have before us the opportunity to forge for ourselves and for future generations a new world order, a world where the rule of law not the rule of the jungle, governs the conduct of nations.\textsuperscript{215}

\textbf{Antarctica}

It is aptly said:

Antarctica is awesome in its beauty. It is so magnificent it is hard to put into words. Endless blue on white, the overwhelming numbers of breeding birds along the coast, the howl of the blizzard, the silence of the desert. It is out last continental wilderness. A wonderland of global significance, a remarkable bastion of purity and silent beauty.\textsuperscript{216}

Antarctica has some of the world’s most inaccessible and hostile terrain. It was discovered over 250 years ago. Antarctica is free from human encroachment out of seven global continents. It is considered as “the epitome of remoteness and inaccessibility”.\textsuperscript{217} In spite of its remote location and absence of any permanent civilisation, Antarctica’s importance to the global environment cannot be insignificant. The prospect of commercial exploitation of Antarctica’s mineral resources raises many concerns about the harm to the environment which could adversely affect the ecosystem of the entire planet. Large scale exploitation of oil and mineral resources would pose serious potential threats to the Antarctic environment and ecosystem. The difficulties inherent in any offshore oil spill would be exacerbated by the harsh climate conditions of Antarctic, requiring longer clean up time and specialised equipment.\textsuperscript{218} Possibility of dust from mining operations would settle on the continent’s snow and

\begin{itemize}
\item \textsuperscript{216} Lyn Goldsworthy “A Realistic Dream for Antarctica, in Greenpeace International, Realistic Dream for Antarctica - Background for an Eight UN Debate” (Pct 20, 1990), at 2 (hereinafter Greenpeace: Background for an Eight UN Debate).
\item \textsuperscript{217} Harm de Blij, A Regional Geography of Antarctica - the Southern Ocean, 33 Uni Miami L. Rev. 229 (1978).
\item \textsuperscript{218} Christopher C Joyner, Protection of the Antarctic Environment: Rethinking the Problems and Prospects 19 Cornell Int’l L.J. 259, 261 (1986).
\end{itemize}
Icefields causing them to melt. Air borne mining debris, harmful particulate matter discharged into the Antarctic environment could further dissipate the depleted ozone layer over the South Pole. The scientists speculate that continued thinning of the ozone layer may cause irreversible changes in the earth's atmosphere which may affect life on earth in times to come. Commercial resource activity could disrupt Antarctica which will have serious global consequences. The Antarctica is not under the control of a single sovereign but is internationally regulated by the Antarctic Treaty System (ATS). The ATS has been developing for more than thirty years, governs economic, political, social, scientific and environmental issues on the continent. April 1991 saw an environmental development in the ATS which was the Protocol on Environment Protection put forth in its final form at the Second Session (Part One) of the Eleventh Antarctic Treaty Special Consultative Meeting (ATSCM) held in Madrid, Spain. This protocol bans all mining operations in Antarctica for the next fifty years was signed by all except South Korea, Indian and Japan. ATS has provided some much needed enhanced protection as begun in 1957 and amended in April 1991 by environmental Protocol. ATS provides substantial protection to the Antarctic environment against mineral resource exploitation in the next half century but permanent environmental security is not assured.

The continent is free from mineral exploitation due to technology shortfalls, economic impracticality and also newly erected barriers. ATS has worked on Antarctica's form of government because it has held in balance the regions underlying political legal and environmental problems. Antarctica is a positively brilliant example of international cooperation on the globes last untamed continental wilderness.

The important question arises, to what extent we change our attitudes, our perceptions our life styles in order to live in equilibrium on this planet with the multitude of

219 Conventional anti pollution devises such as booms, skimmers, and dispersants would be limited use in an oil spill punctuated with large chunks of floating ice. The end result is that oil would remain on water longer and would form environmentally toxic solutions in the see water. See Peterson Antarctica: The Last Great Land rush on Earth 34 Int'l Org 389 (1980).
220 Supra note 218.
221 Id. at 600.
222 Id. at 656
223 Shapley, The Seventh Continent: Antarctica In a Resource Age 16-17 (1985).
species, plants and everything which exists and represents the sum product of our evolutionary history?

**Land Care Programme in Australia**

In this regard “the landcare programme”, in Australia is a national, community based programme which involves voluntary groups at a local or district level in developing, implementing and promoting more sustainable forms of land use and management.\(^{224}\)

“Tell me and I'll forget; show me and I many remember, involve me and I will understand.” That is the basic theme of a programme of this great country - which has turned land conservation on its head in Australia over the last five years or so, called “landcare”. Land degradation was Australia’s biggest environmental problem. Landcare is a three way partnership between the farming community, the conservation movement and the government. Landcare involves one quarter of Australian rural land users in voluntary local conservation groups, each concerned with a particular parcel of land. This programme has achieved an extraordinary level of participation in quite a short time without large public expenditure.

Landcare was catalysed in the early 1980s in the southern State of Victoria and southern parts of Western Australia. People suddenly realised that after one hundred years when the land was cleared for agriculture and in some cases after ten years, extra rain was getting through to the ground water owing to replacement of trees and shrubs with annual grasses. Then came the partnership in 1988 between the National Farmers Federation (NFF) - the leading farmers union, Australian Conservation Foundation (ACF) - the leading green organisation in Australian and they got together. They agreed that land degradation was Australia’s biggest environmental problem.

There have been three major cases in the High Court of Australia relating to World Heritage. Two relate to Tasmania and one to Queensland. These are: Commonwealth of Australia V. State of Tasmania (The Franklin River Dam Case).\textsuperscript{228} Richardson V. State of Tasmania and Gunns Klin Dried Timber\textsuperscript{229} And State of Queensland V. Commonwealth of Australia\textsuperscript{230}.

In such cases the issue involved was states' rights vis-a-vis the federal government. This issue was confronted by the founding fathers of Australia's Constitution in the 1890s and has resurfaced every few years in constitutional cases before the High Court. More recently the Conservative Liberal/National Party Government of Prime Minister Fraser between 1976 and 1983 witnessed the rise of "Cooperative Federalism" wherein the federal government withdrew from various areas which are in its domain which resulted into reduction of the central government's power and enhanced those of the state. Since 1983 the resolution of World Heritage Litigation before the High Court has depended partly on recognition of federal and state powers in relation to environmental matters.

The Franklin River Case involved a political and constitutional dispute arising out of determination by the Hydro-Electric Commission of Tasmania to press ahead with a large hydro dam on the Franklin River in South West Tasmania. By the time the case reached the High Court of Australia, the proposed dam site had been inscribed on the World Heritage List as part of the nomination of the Western Tasmania Wilderness National Parks.\textsuperscript{231}

Again a major dispute erupted in 1986-87 between the Federal and Tasmanian governments regarding the Lemonthyme and southern Forests adjacent to the already listed World Heritage area. These two areas comprise approximately 284,300 hectares.\textsuperscript{232} The dispute was between environmental conservation and Australia's export commitments. These areas are also significant to Aboriginal heritage. Stone

\textsuperscript{228} 86 ALR 519 (1989).
\textsuperscript{229} 77 ALR 237 (1987).
\textsuperscript{230} 86 ALR 519 (1989).
\textsuperscript{231} Id. at 259.
\textsuperscript{232} Id. at 263.
artefacts, bones and rock paintings in cave and rock shelters indicate Aboriginal occupation approximately 20,000 years ago. The sea level between Tasmania and the Australian mainland rose about 12000 years ago, which means that until the European invasion in the late 1700s, Tasmanian Aboriginal people were completely isolated for 500 generations. The Court stated that the Convention allows each country to take into account economic and other factors in deciding how it should discharge that duty.\textsuperscript{233}

In Queensland V. The Commonwealth of Australia\textsuperscript{234} dispute was whether under the World Heritage Properties Conservation Act (Australia) 1983, the Australian Governor General's proclamation that he was satisfied that various parts of the wet tropical rain forests of North-East Australia were "likely to be damaged" could call into effect the Federal Environment Minister's power to forbid certain actions on World Heritage Property. The Queensland Government's pleas were that merely including the property on the list, did not mean it was conclusively part of the natural heritage and a municipal court can still decide for itself as an issue of fact whether the wet tropical forests were part of the natural heritage. Hence, the Queensland government challenged the proclamation and the Commonwealth had no control over the area. The High Court of Australia held that once a property is listed a municipal court may not look behind that decision to determine for itself whether the listing is actually justified.

The federal system of government will continue to generate environmental disputes between the federal government and the states and territories in Australia. A proposed agreement on federal state relations has been worked in the disputes and court actions arising out of the World Heritage Listings and otherwise the main features of the agreement are excellent which is intended to provide the following:\textsuperscript{235}

\begin{itemize}
  \item[(1)] a cooperative approach to the environment;
  \item[(2)] better definition of roles of the respective governments;
  \item[(3)] a reduction in the number of disputes between the commonwealth and the states and territories on environmental issues; and
  \item[(4)] better environmental protection.
\end{itemize}

\textsuperscript{233} Id. at 266.
\textsuperscript{234} 86 ALR 519 (1989).
\textsuperscript{235} Id. at 277.
This has an intense focus on World Heritage and National Estate issues. Hence, people have become conscious that the natural environment that they leave behind them in this life may well become the natural heritage of future generations.\textsuperscript{236}

**Debt for Nature Swaps**

A debt for nature swap is essentially the cancellation or suspension of a portion of a nation’s external debt in return for commitment to various types of environmental programmes.\textsuperscript{237}

Typically, a non-profit conservation organisation buys from a commercial bank (or receives from bank as a donation) discounted sovereign debt, and by agreement with the debtor country, converts debt into local currency or bonds to support local conservation projects administered by local non-profit groups. In this manner not only the debt burden but the need for hard currency is reduced.

Most nature swaps have this concentrated on earth’s nations’ economy. Nations with remaining rain forests appear disproportionately on the list of debtor’s nations carrying excessive burdens.\textsuperscript{238}

To counteract the destructive effects of the economy and poor agricultural management on the forests of Madagascar and other threatened forests in Latin America, Asia and Africa, environmental organisations have pioneered debt for nature swaps. Not all developing countries are good candidates for debt for nature swaps.

The World Wildlife Foundation pioneered the idea of using less developed countries (LDC) debt for financing conservation activities and protecting the global environment at large. Conservation organisations have successfully negotiated debt for nature swap

\textsuperscript{236} Id. at 279.
\textsuperscript{238} Id. at 196.
programmes with seven countries, Bolivia, Costa Rica, Ecuador, the Philippines, Madagascar, Poland and Zambia. Bolivia was the first country to implement a debt for nature swap programme. The transaction was concluded in 1987 and covered 4 million acres of forest and grassland in the Beni River Region. Under the agreement, Conservation International (an American conservation Organization) purchased $650,000 of substantially discounted Bolivia debt for about $100,000 and swapped it for the share of a new company set up to help preserve some 1.6 million hectares of forests and grasslands. It is a good step towards international environmental cooperation. Environmental experts agree that in the near future, we will witness a gross depletion of several species and stocks in tropical rain forests. It is estimated that one million of the earth’s five to ten million species may become extinct within two decades. This will have dire ecological consequences in the host country and subsequently will affect global climate as well.

The Emerging International Environmental Law

As the Earth Summit emphasised the concept of sustainable development, many developing countries are attempting to build a coherent body of environmental law to meet their pressing needs for sound environmental management to support economic growth. Deficiencies in the design and implementation of environmental laws constitute a major hurdle to environmental protection and sound natural resource management in many developing countries. The impetus for enacting new laws in many developing countries often comes from an environmental crisis for the donor community. Several countries in Central and West Africa have enacted environmental laws in various sectors, but none has a comprehensive package of modern environmental laws. The area of "environmental Laws" consists of a mix of national and regional laws, international laws, customary laws, case laws and early 20th century English and French laws. The latter primarily deal with health and sanitation issues and natural resource extraction. Many developing countries of Asia, Africa and Latin America are signatories to various international environmental conventions, such as the UN Convention on the Law of the Sea, the Convention for the Prevention of Pollution of the Sea by Oil, 1969 (Amendments to the 1954 Convention).
The Convention of International Trade in Endangered Species on Wild Fauna and Flora 1973 (Cities), the African Convention for the Conservation of Nature and Natural Resources 1968, the Convention on the Conservation of Migratory Species of Wild Animals, and the Convention on Wetlands of International Importance especially the Waterfowl Habitat, Declaration of the UN Conference on the Human Environment known as the Stockholm Conference, 1972, the World Charter of Nature adopted by the UN General Assembly 1982 and the Earth Summit, 1991 at Rio. The signing of these conventions enabled the countries to pass legislation to comply with their international obligations. Many countries have yet to enact domestic legislation and many enacted but remain unimplemented, unenforceable laws posing a second common problem. Many environmental laws are too vague to apply effectively without more specific subsidiary rules. But many developing countries lack such rules. For example, Ghana’s mining law specifies that:

The holder of a mineral right shall have due regard to the effect of the mineral operations on the environment and shall take such steps as may be necessary to prevent pollution of the environment as a result of such mineral operations.

Improving the design and implementation of environmental law can only occur with increased public awareness and participation, political will and available resources. To develop an effective environmental legal system developing countries need strategies, experience and hope of success. National planning activities such as preparing national environment action plans and UNCED country reports can: serve as important design mechanisms for public participation; identify environmental priorities; and initiate law reform. Environmental impact assessment (EIA) offers a good opportunity for government and other participating organisations to do more implementation oriented work. Enforcement efforts should include fines and other penalties as a means not an end in itself. The post UNCED climate offers promising opportunities to take a fresh look at how to solve problems in environmental legal structures of developing countries.

Let us consider now the failure of international environmental law. Too often international environmental law gives a dangerous illusion that progress is in the
process but in reality it is far from the truth. For example, the sources of cumulative global air pollution, deforestation, sea pollution and species extinction as well as other ecological ills are currently with limited exception, unregulated, in spite of the reality that pollution recognises no legal or geographical boundaries because it is transnational.

The protection of environment is linked with the protection of property rights. There is hardly direct protection of environment per se. The Amoco Cardiz Case explains this point. This case was brought by France and other injured parties, as the result of an oil tanker spill off the coast of Brittany in 1978. In affected sea and land area, 30 per cent of the animal life, 5 per cent of the plant life and about 20,000 birds died. The US District Court awarded damages for cost of clean-up operations, the cost of material and equipment used for the clean up and loss of incomes. But the court refused to grant damages for ecological damage on the basis that harm to ecosystems had already been fully recognised in the claims of fishermen for reduction in their catches and profits. There was no compensation for harm to the environment itself besides the harm suffered by those that exploit it.

International law takes a piece-meal approach to legal regulation. A true solution or resolution of the dangerous state of affairs in the world can only be realised when the spiritual dimensions of human nature are taken into account and the human heart is transformed. Any call to global action for environment and development must be rooted in universally accepted values and principles.

However, a World Federal System guided by universally agreed upon and enforceable laws, will allow nation states to manage cooperatively and increasingly interdependently and rapidly changing world. Hence, any developmental process needs to be in conformity with the planets rich cultural geographic and ecological diversity. To sum up I quote the Indian sages of the Atharva Vedo, who in their Hymn to earth chanted:

“What of thee I dig out, let that quickly grow over. Let me not hit thy vitals, or they heart”.

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