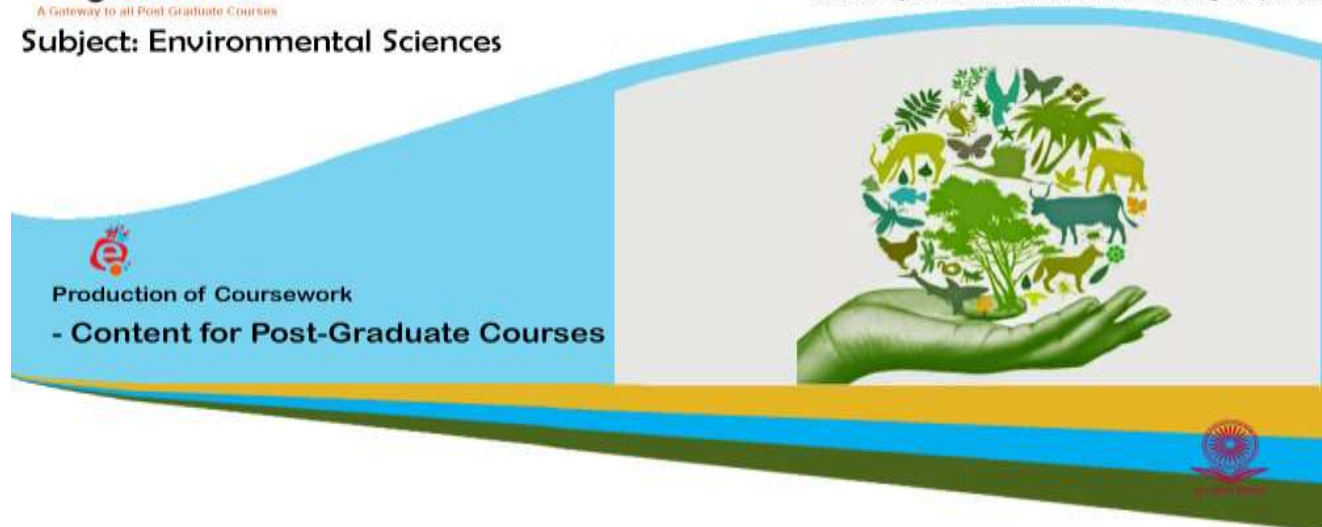


Subject: Environmental Sciences



Production of Coursework
- Content for Post-Graduate Courses

Paper No: 13 Environmental Law and Policies

Module: 1 Environment Pollution : Issues, Challenges and Response at National and International Level



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Description of Module	
Subject Name	Environmental Sciences
Paper Name	Environmental Law and Policies
Module Name/Title	Environment Pollution : Issues, Challenges and Response at National and International Level
Module Id	EVS/ELP-XIII/1
Pre-requisites	
Objectives	The learner will be apprised about major environmental issues in India and globally and the extent of environmental pollution i.e. water, air, noise, soil etc. The learner will also be apprised about response towards environment at the national and international level. Briefly, the reference shall be made to international treaties, conventions, protocols, environmental funds, and laws and policies enacted at the national level.
Keywords	Environment, Pollution, Convention, Protocol

Environment Pollution: Issues, Challenges and Response at the National and International Level

Introduction

Respect for environment and the constituents of environment has always been echoed in Hindu religious texts wherein nature was worshipped and earth is referred to as Mother Earth. In this context, Hindu religious texts have references to Sun, Moon, Earth, Air and Water and they were worshipped as God and Goddesses because they provided us the basic necessities which are essential for human survival. In this backdrop, in the ancient times, forests, trees, water (sacred rivers like Ganga, Saraswati etc), mountains were worshipped and there was stress upon utilization of these resources with restraint and a zest for their protection and conservation. Thus, traditionally, environmental ethics formed an inherent part of Indian religious philosophy.

However, this respect and zeal for protection and conservation of nature and natural resources slowly diminished and was taken over by greed for exploitation of natural resources leading to their rampant exploitation. The greed for gaining control over natural resources without caring for the protection and conservation coupled with population increase led to over exploitation and also created pollution since the household and commercial wastes were discharged either in open or in water bodies. The age of industrialization struck a severe blow to environment since rampant industrialization led to increased emission of pollutants into air and discharges of untreated and hazardous industrial wastes into water bodies. Not only this, technological advances provided greater comforts to humans but also released new chemicals into the environment making it unsuitable for humans and other living organisms.

Industrialization, urbanization, population growth, greed for greater power and globalization had their positive and negative impacts on humans and the environment. Whereas industrialization and technological developments provided greater comfort to human beings but they brought with them their own evils like emission of harmful substances into air and water, increased industrial and municipal waste, increased exploitation of natural resources thereby leading to harmful effects on the environment. Population increase and rampant exploitation of natural resources led to shrinking of forests, constructions on rivers and river catchment areas, conversion of forest land into agricultural and commercial land, dumping of industrial and household wastes on land and in water bodies, over exploitation of ground water etc. All these have put greater strain on natural resources and have led to increased pollution of water, air, land and noise. Not only this, climatic changes have also been witnessed which are attributable to anthropogenic reasons.

Learning Outcomes

The learner will be apprised about major environmental issues in India and globally and the extent of environmental pollution i.e. water, air, noise, soil etc. The learner will also be apprised about response towards environment at the national and international level. Briefly, the reference shall be made to international treaties, conventions, protocols, environmental funds, and also to laws and policies enacted at the national level. The discussion shall be divided into four sections:

- Major Environmental Challenges
- Response at the International Level
- Response at the National Level

MAJOR ENVIRONMENTAL CHALLENGES

The world today is facing many environmental challenges posed by unregulated human activities. These include air pollution and worsening of air quality, water pollution and depletion of water resources, noise pollution and associated problems, soil pollution and contamination of soil and ground water table, climate change, depletion of forests, loss of biodiversity, depletion of ozone layer,

problems associated with mouting garbage and wastes including hazardous and toxic wastes. These are briefly discussed in this section

Air Pollution

The quality of air across the globe has deteriorated over time in varying degrees. Ambient air quality has become a serious challenge across the globe. Not only commercial, economic and industrialized activities deteriorate the ambient air quality but household air pollution has also become a serious challenge to mankind. In some cities/countries, the air quality has worsened to the extent of being extremely poor and hazardous for inhabitation especially in fastest growing urban areas of the world wherein rapid increase in economic and industrial activities is seen. However, the problem is not confined to urban areas but is also prevalent in rural areas. The main reasons are emissions from fossil fuels, household emissions caused by burning of solid fuels etc., emissions from industries, rampant construction and pollution caused by other human and natural activities.

As per the World Bank about 87 percent of the world's population now live in countries in which air pollution levels exceed air quality guidelines set by the World Health Organization (WB, 2016). The report points out that the situation in low and middle income countries is alarming where 90% of the population was exposed to dangerous levels of air pollution in 2013. The report brings out that the air pollution poses a grave health hazard and is responsible for high mortality rate. It is claimed that premature mortality due to air pollution has increased by 30% from 1990 to 2013 and around 2.9 million deaths per annum are attributable to ambient PM 2.5 levels. Ambient air quality has been claimed to be fourth leading fatal health risk globally. It must also be remembered that air pollution is not just a health hazard but it also adversely affects agricultural productivity and development.

India is also severely afflicted by air pollution. As per the reports around 1.2 million people die in India annually on account of air pollution related diseases and it costs around 3% of India's Gross Domestic Product. Assessment by Greenpeace of India's 168 cities across 24 states shows that none

of these cities in India can claim to have clean air by WHO standards (Greenpeace Report, 2017). Large number of people in India continue to use solid fuels like charcoal, dung, wood etc. for cooking and heating which increases household air pollution level affecting millions of people in India and Billions globally especially in developing and least developed countries making them prone to severe health hazards of air pollution. Some of the Indian cities have recorded air quality index with PM 2.5 levels of 500 which is the highest the scale can measure (Indian Express, November 10, 2017) which shows the extent of gravity of the situation.

Water Pollution

Water pollution is another issue which is facing the humankind at global level. Discharge of untreated sewage, industrial affluent and other discharges into water bodies has polluted major rivers across the globe and this is more so in developing countries. As per the report of UNEP, Water pollution has worsened since 1990s in the majority of rivers in Latin America, Africa and Asia (UNEP, Snapshot of World's Water Quality, 2016). UNEP reports that around 1/3rd of all river stretches in Latin America, Asia and Africa are severely affected by pathogen pollution and it presents a serious health hazard posed not only by drinking contaminated water but also by using the same for bathing or other human purposes. The increase in pathogen and organic pollution is more than 50% in these regions and Asia is most severely hit by it. More than 323 million people living on these continents run the risk of water borne diseases. However, the menace is not confined to these continents alone or to developing countries alone even the developed countries are facing the same. For instance, water pollution causing severe water borne diseases has been reported in countries like Canada (John Vidal, Cleaning the World's Water). Contamination of water not only presents health hazards but also affects food production and economies of the nations.

So far as India is concerned, it is claimed that 80% of India's surface water is polluted (Times of India, 28th June 2015). Central Pollution Control Board has estimated that 75-80% of water pollution is from domestic sewage since untreated sewage flows into water bodies which has polluted all major rivers in

India. Not only this, there is problem of pollution of ground water table which is also caused by unregulated industrial activities. Common pollutants of ground water table include arsenic, fluoride, nitrate, iron, bacteria, phosphates and heavy metals. These contaminants enter the ground water table through overuse of fertilizers, pesticides & insecticides, septic tanks, underground gas tanks, landfills. Perusal of the facts reveals that in majority of states, ground water table is contaminated. The following table shows the States and Districts which are affected by geogenic contamination in ground water as on July 2014.

Geogenic Contaminants	Number of affected States	Number of Affected Districts
Arsenic	10	68
Fluoride	20	276
Nitrate	21	387
Iron	24	297

Source: Central Ground Water Board

The reports reveal that in the states of Haryana, Punjab, Uttar Pradesh, Bihar, Jharkhand, Chhattisgarh, West Bengal, Assam, Manipur and Karnataka the ground water table was affected by high arsenic contamination in 68 districts affected. The problem of presence of Uranium and arsenic in ground water has been highlighted by Parliamentary reports as well. In certain areas, the problem has become acute. It is reported that water in nearly all 200 wells in a village in West Bengal was contaminated by high arsenic content and the villagers were using the same for drinking purposes. The incidence of such contamination is on the rise. (Asit K Biswas and Chris Hartley, July 22, 2017). Further, the situation is aggravated by over utilization of ground water leading to depletion of ground water table and it is claimed that India’s ground water future is at stake. (Esha Zaveri, 2017).

Ocean Acidification

Ocean acidification is another cause of concern in international environmental governance. Oceans are sinks of carbon dioxide and have been absorbing excess heat caused by GHG emissions. More than quarter of the CO₂ emitted in the atmosphere is absorbed by the oceans leading to warming of ocean waters at almost all levels and acidification of the oceans which is detrimental to marine ecosystems. Since the onset of industrial revolution, acidity of surface waters have increased by 30% (NASA) which is attributable to CO₂ emissions which are being absorbed by the oceans. The absorption of CO₂ by oceans is increasing every year making them more acidic. Absorption of CO₂ by oceans is increasing by 2 billion tons per annum.

Noise Pollution

Noise pollution is also presenting as a significant environmental concern in the recent years. Noise pollution has significant impact on human health and recently data has shown the proportionate hearing loss attributable to noise pollution (Alex Grey, 2017). As per the recent study in 2017, where noise pollution levels in 50 cities across the globe was measured, it was found that the Guangzhou in China is worst affected city followed by New Delhi, India. Mumbai ranks 4th worst city in noise pollution. The studies have found that excessive noise pollution is not only causing discomfort and other related diseases but is also responsible for hearing loss. As per WHO more than 360 million people are afflicted by hearing loss and of these, around 32 million are children. The average city dweller is found to be having hearing loss equivalent to 10-20 years older than his actual age. Unfortunately, in the hearing loss rank, New Delhi tops the global list followed by Mumbai wherein maximum hearing loss of 20 years than the actual age is reported (World Hearing Loss City Ranking, 2017).

Soil Pollution

Soil degradation is yet another serious environmental challenge being faced by the modern world. Soil pollution means the presence of chemicals in excess of natural compositions on the soil which degrade

the soil. Soil pollution and soil degradation is the result of various human activities like use of excessive fertilizers, pesticides, herbicides, insecticides, agricultural practices, antibiotics contained in animal manure, sewage, waste dumping and industrial and mining activities leading to seepage of chemicals into the soil. As per Food and Agriculture Organization of the United Nations, around 1/3rd of the world's soils are degraded and billions of tonnes of soil are lost to farming each year. It has seriously affected farmlands (FAO, 2017). The problem has affected various nations of the world. E.g. the joint study conducted by Yale Environment and Chinadialogue reported in 2014 that 16.1% of the China's soil are polluted and the figure for farmlands was higher. The main contaminants are cadmium, lead, nickel and arsenic. As per the report of FAO, 40% of the African continent's soils are degraded (FAO, Status of the World's Soil Resources, 2015). So far as India is concerned, it has also been facing this problem at a large scale. State of India' Environment, 2017 has reported that around 40 to 70% of land in India has undergone desertification. Further, India is one of the four major countries affected by soil salination.

Climate Change

One of the most serious issues caused by environmental degradation is climate change which has a very serious effect on human beings, ecosystems and other living organisms. Climate Change implies changes in the usual weather found at a particular place over a period of time i.e. the rainfall spells, rainfall quantum, duration, timing, dry spells, changes in temperature, changes in winter season etc. It implies changes in earth's climate in totality. Climate change was considered to be a rhetoric by majority of the people around the world but now it has been scientifically established that earth's climate is actually changing.

It has been reported that annual average surface air temperature of the earth has increased by 1.8 degree Fahrenheit during the last 115 years i.e. from 1901-2016. Climate change manifests in various forms including in the form of global temperature rise and the resultant effects of the same i.e.

shrinking of ice sheets at the poles; melting of glaciers and glacier retreat around the globe i.e. in Himalayas, Alaska, Alps etc.; rise in sea level and the threat to survival of coastal cities/nations etc.

Waste Generation and Waste Management

One of the serious threats posed by unregulated activities of mankind and increase in population is the increasing waste generation in countries by domestic, commercial and industrial activities and the threat posed by unscientific management of such wastes to the environment across the frontiers. With the advent of science and technology and increase in consumer comforts and consumer goods, the quantum of waste generation is on the increase. Such waste includes municipal solid waste, plastic waste, construction waste, bio-medical waste, e-waste, hazardous waste, commercial waste, sewage, untreated affluent from industries, atomic waste etc. If this waste is not managed scientifically, it poses serious threat to the environment. The problem is acute in developing countries like China and India and the waste is not only polluting the soil, air and water but the hazardous waste is also causing serious health hazards to the people.

Loss of Biodiversity

Biological diversity is very important for the existence and resilience of ecosystems, for the survival of ecosystem and its ability to prevent and recover from disasters. Biological diversity refers to diversity in varied kinds of genes and species. It includes within itself infinite variety of life forms; variety of species in flora and fauna; variety of ecosystems; variations of genes in individual species etc. Various human activities have direct and indirect impact on biological diversity. Due to loss of habitat, soil degradation, climate change, pollution and over exploitation of biological resources etc., substantial and irreversible loss to biodiversity has been reported (Millennium Ecosystem Assessment, 2005). Loss of biodiversity will have disastrous consequences on ecosystem, livelihood, health and ultimately survival of the poor.

INTERNATIONAL RESPONSE TO ENVIRONMENTAL ISSUES

Environmental problems posed by mankind received worldwide recognition together with the need for protection, preservation and improvement of the environment at the UN Conference on Human Environment held in Stockholm in June 1972. It proved to be a catalyst in international efforts directed at preserving the environment and mitigating the loss caused by human efforts. Since 1972, international community has been alive to environmental problems and various Conventions, Protocols and treaties have been adopted and enforced. This apart various institutions have been established to provide for international environmental governance. This section will briefly deal with the international response to environmental challenges.

UN Conference on Human Environment, 1972

UN Conference on Human Environment, 1972 held in Stockholm was the first major UN effort towards environmental protection. It recognized and acknowledged environmental problems and adopted Stockholm Declaration. The Conference was held from June 5-16 in 1972 wherein over 11 days the nations of the world deliberated on environmental issues and adopted the Stockholm Declaration which contained 26 General Principles. This apart, the Conference resulted in adoption of 109 specific recommendations which constituted Action Plan on Environment (Veit Koester, 1990). The Stockholm Declaration contained general principles and it paved the path for adoption of legal rules concerning international environmental problems. Stockholm Declaration also created a separate independent international environmental law regime. Though the principles laid down in the Declaration were not legally binding yet they proved to be catalyst in development of International Environmental Governance. Declaration focuses not only on interrelations between States but also on relations with individuals and international organizations, as well as on socio-economic factors.

The Principles enunciated in the Declaration called for safeguarding natural resources i.e. air, water, land, flora and fauna, ecosystems etc.; promotion and protection of the environment; wildlife conservation; management of toxic substances; preventing pollution of the oceans etc. As a follow up

to the Declaration, UN General Assembly adopted resolution (2997 / XXVII 15th December, 1972) in December 1972, wherein United Nations General Assembly underlined the urgent need for establishment of permanent international institution for protection and improvement of the environment and accordingly United Nations Environment Programme (UNEP) was established. Thus, Stockholm Declaration has become a foundation of International Environmental Law.

World Charter for Nature, 1982

In October 1982, General Assembly of the United Nations adopted World Charter for Nature. The Charter recognizes that excessive exploitation of natural resources and destruction of habitats causes irreversible damage to ecology and biodiversity. It further provides that competition for scarce natural resources can lead to conflict and degradation of such resources. The Charter provided that the nature shall be respected and it called for the preservation of life forms on earth so as to prevent them from being extinct. The Charter also called for sustainable utilization of natural resources and protection and preservation of land and sea. In essence the Charter calls for conforming to the principles laid down in Stockholm Declaration. The Charter also recognizes fundamental principles laid down by International Union for Conservation of Nature and UNEP. The Charter contained 24 declarations.

Vienna Convention, 1985

To deal with depletion of ozone layer due to anthropogenic reasons and the resultant effect of the same on humans, the developed countries signed a treaty at Vienna which is known as Vienna Convention, 1985. It was the outcome of efforts of twenty countries who were largely responsible for producing Chlorofluorocarbons (CFC) which is responsible for depletion of ozone layer. Vienna Convention is a framework treaty which sets out the general obligation of the parties to cooperate, promote research and exchange information on adverse impact of human activities on the Ozone layer and to take appropriate legal, administrative and policy measures to control, limit and replace the activities which have adverse impact on the ozone layer in accordance with their means and capabilities. The Convention was aimed at promoting research on physical and chemical processes which affect or are likely to affect ozone layer and to identify such substances so that their emissions can be limited or

regulated and to find viable alternatives. Though, the Convention did not lay down any specific targets and did not provide any legally binding actions to be taken by the parties yet it provided a framework for such legally binding actions to be taken in the future.

Montreal Protocol on Substances that Deplete the Ozone Layer, 1987

Vienna Convention paved the way for the adoption of a legally binding instrument for regulating and ultimately prohibiting the emission of Ozone Depleting Substances (ODS) in a specific time frame. The Montreal Protocol was such legally binding instrument which was adopted in 1987 and it has received universal ratification. The Protocol is based on two important principles i.e. Common but Differentiated Responsibilities and respective capabilities and Precautionary Principle. It provided for regular updates based on scientific knowledge for amendments of the Protocol and for identifying new ODS so that they can phased out in a time bound manner. Various controlled substances identified so far and for which phase out schedule has been laid down are CFCs (Chlorofluorocarbons), Halons, Fully Halogenated CFCs, Carbon Tetrachloride, Methyl Chloroform, Hydrochlorofluorocarbons (HCFC), Hydrobromofluorocarbons (HBFC), Methyl Bromide and Bromochloromethane and HFCs. Montreal Protocol is one of the most successful efforts of the UN.

Rio Declaration, 1992

One of the significant international effort dealing with environmental pollution was the Earth Summit held on Rio de Janeiro in 1992. The International Conference on Human Environment of 1992 discussed in detail various issues like Greenhouse effect, desertification, global warming, deforestation, ozone depletion and other issues. Earth Summit provided groundwork for entering into various multilateral treaties, agreements and guidelines dealing with environmental issues (Solange Mouthaan, 1995). The Earth Summit resulted in approval of three key documents i.e.

- Rio Declaration on Environment and Development which contained 27 non binding guiding principles on environment and development

- An action plan in the form of Agenda 21 dealing with Sustainable Development. The institution for monitoring the implementation of Agenda 21 was also created i.e. Commission on Sustainable Development
- An authoritative statement of Principles for a global consensus on the management, conservation and sustainable development of forests. The statement is not legally binding

Rio Declaration provided a great impetus of international environmental law and it led to the adoption of United Nations Framework Convention on Climate Change, Convention on Biological Diversity and the negotiation on Convention on Desertification. Earth Summit also paved the way for future summits/conferences on Agenda 21 and accordingly, Earth plus five summit was held in 1997 at New York wherein resolution for further implementation of Agenda 21 was adopted. Again in 2002 in Johannesburg World Summit on Sustainable Development or Earth plus 10 was held which resulted in adoption of Johannesburg Declaration wherein it was decided to integrate economic development, social development and environmental protection. In 2012 Rio + 20 summit or UN Conference on Sustainable Development was held in Brazil wherein it was decided to develop Sustainable Development Goals for further development post 2015 building on Millennium Development Goals.

Convention on Biological Diversity, 1992

As stated earlier, biodiversity is essential for the survival of ecosystems. Accordingly, when biological diversity was threatened, the world fora started making efforts for preventing the loss of biodiversity. Prior to 1992 various other efforts were made for protection of nature and wild life particularly after Stockholm declaration of June 1972 i.e. Convention regarding Protection of World Culture and Natural Heritage 1972; Convention on International Trade in Endangered Species (CITES), 1973; The Berne Convention on Conservation of European Wild Life and their Natural Habitats 1979 etc. These efforts further fructified in the form of adoption of Convention on Biological Diversity, 1992.

CBD entered into force on 29th December 1992. CBD is a comprehensive treaty dealing with conservation and protection of biodiversity. It recognizes sovereign rights of states to exploit natural and biological resources but at the same time seeks to ensure that the utilization of biological resources

should not endanger biodiversity. Therefore the Convention is based upon sustainable development principle. The Convention aims at sustainable use of natural and biological resources and for sharing of benefits arising out of use of genetic resources in an equitable manner and to ensure biosafety. The Convention also paved the way for adoption of Protocols under it.

Advancements in biotechnology and development of genetically modified organisms led to concerns on biosafety. Accordingly, Cartagena Protocol on Biosafety under CBD was adopted in 2000 which entered into force on 11th September 2003. The Protocol basically aims at governing and regulating trans-boundary movement of Living Modified Organisms. The objective of the Protocol is to ensure safety and protection while dealing with the transfer of Living Modified Organisms and to ensure safe handling of such organisms during international transboundary movement.

As stated earlier, CBD seeks to ensure sharing of benefits arising out of utilization of biological resources and accordingly to ensure this and to develop norms regarding this objective another Protocol was adopted in Nagoya on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits arising from their Utilization on 29th October 2010. The Protocol entered into force on 12th October 2014. The Protocol aims to ensure fair and equitable sharing of benefits arising out of the utilization of genetic resources and further to ensure fair and equitable access to traditional knowledge associated with genetic resources. In order to comply with the objectives of the Protocol, it provides for promoting efforts for technology transfer, cooperation, conservation of biodiversity and for sustainable use of biodiversity.

Climate Change related Efforts

As stated earlier, Climate Change is the most serious environmental hazard which is confronting the mankind and which is the consequence of human activities. In this context, the response of the international community has been positive and various efforts have been made to contain climate change and to adapt to climate change. The Montreal Protocol on Substances that Deplete the Ozone Layer is one such step. Though it was originally enacted with the purpose of regulating and phasing out ozone depleting substances yet the positive effect of phasing out of ozone depleting substances on

containing climate change can not be undermined. Such substances are powerful greenhouse gases and their elimination has certainly prevented the acceleration of climate change.

This apart, another significant effort in this direction was the setting up of Intergovernmental Panel on Climate Change (IPCC) in 1988 by World Meteorological Organization and United Nations Environment Programme (UNEP) with the objective of assessing climate change; to provide scientific data regarding climate change and; to suggest probable policy measures. The main aim of IPCC is to study the effects of Climate Change and the future risks associated with it so that a suitable approach for combating, mitigating and adapting to climate change can be adopted. IPCC has been submitting assessment reports and has completed five assessment cycles and is pursuing its sixth assessment cycle. IPCC also publishes various special reports to deal with particular environmental issues so as to create scientific database for taking future steps.

Another major step to deal with climate change was the adoption of a framework treaty i.e. United Nations Framework Convention on Climate Change (UNFCCC). This treaty provided a framework for dealing with climate change. It was adopted in 1992 and entered into force on 21st March 1994. The main aim of UNFCCC is to stabilize greenhouse gas concentration in a time bound manner so as to reduce and contain the impact of GHG on climate change. UNFCCC recognizes and is based on the Doctrine of 'Common but Differentiated Responsibilities and respective capabilities'. UNFCCC places onus on developed countries detailed in Annex A to reduce emission of GHG and also to help developing countries in containing GHG by technology transfer and financial support. UNFCCC mandates preparation of annual inventory of GHG emissions including data for base year (1990).

UNFCCC paved the way for adoption of Protocol providing for mandatory targets for reduction of emission of greenhouse gases. Accordingly, Kyoto Protocol was adopted and it entered into force on 16th February 2005. The Protocol has provided mandatory targets for reduction of GHG emissions by Annex 1 countries i.e. developed countries and countries with economies in transition to market economy. The object of the Protocol was to reduce emission of GHG by atleast 5% below 1990 levels during the first commitment period i.e. 2008-2012. Higher targets have been prescribed for second

commitment period i.e. for 2013 to 2020 e.g. European Union has agreed to have joint target of 20% reduction of GHG of its 1990 level. The Protocol offers flexibility to the nations to reduce emissions in their own territory or to finance projects in other countries to reduce emissions.

Another significant development in the field of Climate Change took place in 2015 in 21st Conference of Parties of UNFCCC when Paris Agreement on Climate Change was adopted. Paris Agreement provides for reduction in emissions so as to limit increase in global average temperature upto 2 degree Celsius above pre-industrial levels though the ambitious aim of the Paris Agreement is to contain temperature increase upto 1.5 degree Celsius above pre-industrial levels. The agreement aims that the global emissions of GHG should peak as early as possible and there should be rapid reductions thereafter. The Agreement calls for ensuring that the global emission of GHG during the period 2050 to 2100 should be to that level only which can be absorbed by natural sinks. Agreement mandated parties to submit Intended National Determined Contributions containing the action plan of the country parties to contain climate change and to reduce the emission of GHG.

Basel Convention

The Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal is one of the important international measure taken to combat the menace of hazardous wastes and its transboundary movement and their disposal. The Convention was adopted on 22nd March 1989 in Basel. The Convention entered into force in 1992. The objective of the Convention is to protect human health and environment from the adverse effects of hazardous wastes. The Convention was aimed at reduction of hazardous waste generation and to promote proper disposal and effective and environmentally sound management of the hazardous wastes. The Convention further aims at restricting transboundary movement of hazardous wastes and to provide for a regulatory system.

Not only that international community has entered into various Conventions, treaties and Protocols but has also created institutions for international environmental governance like United Nations

Environment Programme (UNEP), Global Environment Facility (GEF), High Level Political Forum, United Nations Development Programme, World Meteorological Organization etc.

National Response

Environment problems have confronted India also and accordingly, India has also taken various legislative and policy measures to combat environmental pollution complying with international obligations and national duties. Constitution of India originally did not contain any provisions pertaining to environment though environment ethics always formed part of 'Dharma' in India. Stockholm Declaration motivated India to enact various legislations dealing with environmental issues and the beginning was made by enacting Wildlife (Protection) Act, 1972 followed by Water (Prevention and Control of Pollution) Act, 1974. This was followed by amendment of the Constitution by Constitution (Forty Second Amendment) Act, 1976 when provisions relating to environment were incorporated in the Directive Principles of State Policy in the form of Article 48A and in Fundamental Duties {Article 51A(g)}. This apart entries 17A and 17B were inserted in the Concurrent List relating to Forests and Protection of Wild Animals and birds respectively. This led to development of environmental law, policy and jurisprudence in India.

Thereafter, India has enacted various environmental legislations like Air (Prevention and Control of Pollution) Act, 1981; Environment (Protection) Act, 1986; The Wild Life (Protection) Act, 1972; Forest Conservation Act, 1980; The Biological Diversity Act, 2002; Public Liability Insurance Act, 1991; National Green Tribunal Act, 2010; Coastal Regulation Zone Notification, 2011 etc. This apart, India has enacted various rules and regulatory mechanism for dealing with waste disposal and management in an environmentally sound manner. These include :

- Atomic Energy (Safe Disposal of Radioactive Wastes) Rules, 1987
- The Manufacture, Storage and Import of Hazardous Chemical Rules, 1989
- The Manufacture, Use, Import, Export and Storage of Hazardous Micro-Organisms/Genetically Engineered Organisms or Cells Rules, 1989
- The Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996

- Ozone Depleting Substances (Regulation and Control) Rules, 2000
- Batteries (Management and Handling) Rules, 2001
- Atomic Energy (Radiation Protection) Rules, 2004
- Atomic Energy (Radiation Processing of Food and Allied Products) Rules, 2012
- Bio-Medical Waste Management Rules, 2016
- Solid Waste Management Rules, 2016
- E-Waste (Management) Rules, 2016
- Plastic Waste Management Rules, 2016
- Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016
- Construction and Demolition Waste Management Rules, 2016

Concluding Observations

Environmental degradation and environmental pollution is one of the most serious risks being faced by humanity and other living organisms. However, the risk is posed primarily because of human activities and failures. The risk is so grave that it affects the survival of ecosystems and living organisms. The international community has made various efforts to combat such hazards and have, apart from entering into various treaties, established institutions to cope up with environmental issues. Various countries across the globe, including India, have enacted legislations dealing with variety of environmental challenges. Though various legislative and policy measures have been taken at the national and international level yet the environment remains a serious concern and the efforts have not sufficed. Humanity is at risk and we are on pollution bombshell is ready to explode anytime and take millions within its sweep unless we act and act stringently.

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