

ENVIRONMENTAL GEOGRAPHY -18MAG14E

Syllabus - UNIT – V: Environmental Management and Planning: Environmental Law and Protection – Environmental Impact Assessment - CPCB – TNPCB – Global Warming - Ozone depletion – International Co-operations: Stockholm Conference - Earth Summit - Kyoto protocol – Agenda 21.

Environmental impact assessment

Environmental Impact Assessment (EIA) is a process of evaluating the likely environmental impacts of a proposed project or development, taking into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse.

Evolution & History of EIA

EIA is termed as one of the best policy innovations in the 1900s. The main aim of EIA is to conserve the environment and bring out the best combination of economic and environmental costs and benefits. Read the below-mentioned points to understand the Environmental Impact Assessment evolution and history:

- The birth of EIA is dated back to the 1970s. In 1969, The USA had brought its first National Environment Policy Act (NEPA) 1969.
- The EIA was initially practiced by developed nations but slowly it was also introduced in developing nations including India.
- Columbia and the Philippines are the earliest examples of developing nations who introduced EIA in their policies. Columbia brought it in 1974 while the Philippines in 1978.
- Worldwide, EIA is now practiced in more than 100 countries. By the mid-1990s, some 110 countries applied EIA as a major environmental policy.
- In 1989, EIA was adopted as the major development project by the World Bank.

Objectives of Environmental Impact Assessment

- Identifying, predicting, and evaluating economic, environmental, and social impacts of development activities.
- Providing information on the environmental consequences for decision making.
- Promoting environmentally sound and suitable development by identifying appropriate alternatives and mitigation measure

Importance of Environmental Impact Assessment

- EIA is a good tool for prudent environment management.
- It is government-policy that any industrial project in India has to secure EIA clearance from the Environment Ministry before approval for the project itself.

Current EIA Reports – India

EIA Notification 2020 draft has been made public. Once the EIA Notification 2020 will be published in the Official Gazette, it will replace EIA notification 2006. EIA has been in the news following EIA notification 2020 was drafted as one of the amendments will be the removal of public consultation from several activities (Put under Category B2).

Here are a few important terms/agencies concerning EIA notification 2020 which aspirants should further read about:

1. Accredited Environment Impacts Assessment Consultant Organization (ACO)
2. Central Pollution Control Board
3. Certificate of Green Building
4. Corporate Environment Responsibility
5. Eco-Sensitive Area/ Eco-Sensitive Zone

Environmental Impact Assessment in India

- EIA started in India in 1976-77 when the Planning Commission directed the Department of Science & Technology to assess the river valley projects from the point of view of the environment. This was extended for all those projects that required approval from the Public Investment Board.
- Then, in 1986, the government enacted the Environment (Protection) Act which made EIA statutory. The other main laws in this regard are the Indian Wildlife (Protection) Act (1972), the Water Act (1974), the Air (Prevention and Control of Pollution) Act (1981), and the Biological Diversity Act (2002).
- In 1982, the Ministry of Environment, Forest and Climate Change set up the Environmental Information System (ENVIS) to collect, collate, storing, retrieving and disseminating information related to the environment sector. This serves as a web-based distributed network of subject-specific databases. The chief purpose of the ENVIS is to integrate all countrywide efforts to collect, store, disseminate, and use environment-information for better managing environmental assessment activities.

CENTRAL POLLUTION CONTROL BOARD

The Central Pollution Control Board (CPCB), statutory organisation, was constituted in September, 1974 under the Water (Prevention and Control of Pollution) Act, 1974. Further, CPCB was entrusted with the powers and functions under the Air (Prevention and Control of Pollution) Act, 1981.

It serves as a field formation and also provides technical services to the Ministry of Environment and Forests of the provisions of the Environment (Protection) Act, 1986. Principal Functions of the CPCB, as spelt out in the Water (Prevention and Control of Pollution) Act, 1974, and the Air (Prevention and Control of Pollution) Act, 1981, (i) to promote cleanliness of streams and wells in different areas of the States by prevention, control and abatement of water pollution, and (ii) to improve the quality of air and to prevent, control or abate air pollution in the country.

Air Quality Monitoring is an important part of the air quality management. The National Air Monitoring Programme (NAMP) has been established with objectives to determine the present air quality status and trends and to control and regulate pollution from industries and other source to meet the air quality standards. It also provides background air quality data needed for industrial siting and towns planning.

Besides this, CPCB has an automatic monitoring station at ITO Intersection in New Delhi. At this station Resirable Suspended Particulate Matter (RSPM), Carbon Monoxide (CO), Ozone (O₃), Sulphur Dioxide (SO₂), Nitrogen Dioxide (NO₂) and Suspended Particulate Matter (SPM) are being monitored regularly. This information on Air Quality at ITO is updated every week.

Water Quality Monitoring is an important part of the Water quality management. Fresh water is a finite resource essential for use in agriculture, industry, propagation of wildlife & fisheries and for human existence. India is a riverine country. It has 14 major rivers, 44 medium rivers and 55 minor rivers besides numerous lakes, ponds and wells which are used as primary source of drinking water even without treatment. Most of the rivers being fed by monsoon rains, which is limited to only three months of the year, run dry throughout the rest of the year often carrying wastewater discharges from industries or cities/towns endangering the quality of our scarce water resources. The parliament of India in its wisdom enacted the Water (Prevention and Control of Pollution) Act, 1974 with a view to maintaining and restoring wholesomeness of our water bodies. One of the mandates of CPCB is to collect, collate and disseminate technical and statistical data relating to water pollution. Hence, Water Quality Monitoring (WQM) and Surveillance are of utmost importance.

TNPCB

The **Tamilnadu Prevention and Control of Water Pollution Board** was constituted by the Government of Tamilnadu on twenty seventh day of February, Nineteen eighty two (27-2-1982) in pursuance of the Water (Prevention and Control of Pollution) Act, 1974 (Central Act 6 of 1974). The Board was later renamed as Tamilnadu Pollution Control Board (TNPCB) in the year 1983. It enforces the provisions of the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the rules made under these Acts, which includes.

- The Water (Prevention and Control of Pollution) Act, 1974
- The Tamilnadu Water (Prevention and Control of Pollution) Rules, 1983.
- The Air (Prevention and Control of Pollution) Act, 1981
- The Tamilnadu Air (Prevention and Control of Pollution) Rules, 1983.
- The Environment (Protection) Act, 1986
- The Environment (Protection) Rules, 1986
- Manufacture, Storage and Import of Hazardous Chemical Rules, 1989
- Fly Ash Utilization Notification 1999
- The Batteries (Management and Handling) Rules, 2001
- The Environment Impact Assessment Notification, 2006
- The Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016
- The Bio-Medical Waste Management Rules, 2016
- The Solid Waste Management Rules, 2016
- The Plastic Waste Management Rules, 2016
- The E-Waste Management Rules, 2016
- The Construction and Demolition Waste Management Rules, 2016

Tamil Nadu Pollution Control Board (TNPCB), was established on 27.2.1982. It functions with Head Office at Chennai, 7 Zonal offices and 38 District offices. The Board office is headed by the Chairman, Zonal offices are headed by the Joint Chief Environmental Engineers, and the 38 District offices are headed by District Environmental Engineers. Two flying squads are also functioning at Erode and Tiruppur which are headed by the Environmental Engineers.

To assist in the Analytical and Scientific side, the Board has established 8 Advanced Environmental Laboratories, 8 District Environmental Laboratories.

TNPCB is implementing the Pollution Control Legislations and Rules and Notifications framed therein. In discharging the duties entrusted to it, the Board investigates, collects and disseminates data relating to water, air and land pollution, lays down standards for sewage/trade effluent and emissions.

TNPCB issues consent to new industries in two stages. Consent to establish is issued depending upon the suitability of the site before the industry takes up the construction activities and consent to operate is issued after installation of pollution control measures by the unit to satisfy the standards.

The field officers of the Board periodically inspect every industry under their jurisdiction to assess the adequacy of treatment measures provided to treat the effluent and gaseous emission.

TNPCB issues show cause notices , takes legal actions and also issues directions for closure, stoppage of power supply, water supply etc., against erring industries / agencies for non-compliance of pollution control legislations, conditions and standards.

TNPCB has delegated the power to the field officers for close monitoring. The Joint Chief Environmental Engineer/ District Environmental Engineers are empowered to issue/renew consent to orange and green category industries and for red small category industries. They are also empowered to issue show cause notices to all the industries.

TNPCB plays a catalytic role in the implementation of Common Effluent Treatment Plants (CETPs) for small scale units like tanneries, textile dyeing units etc., located in clusters.

TNPCB is taking effective steps for safe disposal of hazardous wastes and has completed the inventory of hazardous waste generating units and also identified sites for disposal of hazardous wastes.

TNPCB creates environmental awareness in the State through the Environmental Training Institute , Environmental Awareness Cell, Environmental Awareness Programme, etc

Global warming

Over the past 50 years, the average global temperature has increased at the fastest rate in recorded history. And experts see the trend is accelerating: All but one of the 16 hottest years in NASA's 134-year record have occurred since 2000.

Climate change deniers have argued that there has been a "pause" or a "slowdown" in rising global temperatures, but several recent studies, including a 2015 paper published in the journal Science, have disproved this claim. And scientists say that unless we curb global-warming emissions, average U.S. temperatures could increase by up to 10 degrees Fahrenheit over the next century.

Causes global warming

Following are the major causes of global warming:

Man-made Causes of Global Warming

- ***Deforestation***

Plants are the main source of oxygen. They take in carbon dioxide and release oxygen thereby maintaining environmental balance. Forests are being depleted for many domestic and commercial purposes. This has led to an environmental imbalance, thereby giving rise to global warming.

- ***Use of Vehicles***

The use of vehicles, even for a very short distance results in various gaseous emissions. Vehicles burn fossil fuels which emit a large amount of carbon dioxide and other toxins into the atmosphere resulting in a temperature increase.

- ***Chlorofluorocarbon***

With the excessive use of air conditioners and refrigerators, humans have been adding CFCs into the environment which affects the atmospheric ozone layer. The ozone layer protects the earth surface from the harmful ultraviolet rays emitted by the sun. The CFCs has led to ozone

layer depletion making way for the ultraviolet rays, thereby increasing the temperature of the earth.

- ***Industrial Development***

With the advent of industrialization, the temperature of the earth has been increasing rapidly. The harmful emissions from the factories add to the increasing temperature of the earth.

In 2013, the Intergovernmental Panel for Climate Change reported that the increase in the global temperature between 1880 and 2012 has been 0.9 degrees Celsius. The increase is 1.1 degrees Celsius when compared to the pre-industrial mean temperature.

- ***Agriculture***

Various farming activities produce carbon dioxide and methane gas. These add to the greenhouse gases in the atmosphere and increase the temperature of the earth.

- ***Overpopulation***

Increase in population means more people breathing. This leads to an increase in the level of carbon dioxide, the primary gas causing global warming, in the atmosphere.

Natural Causes of Global Warming

- ***Volcanoes***

Volcanoes are one of the largest natural contributors to global warming. The ash and smoke emitted during volcanic eruptions goes out into the atmosphere and affects the climate.

- ***Water Vapour***

Water vapour is a kind of greenhouse gas. Due to the increase in the earth's temperature more water gets evaporated from the water bodies and stays in the atmosphere adding to global warming.

- ***Melting Permafrost***

Permafrost is there where glaciers are present. It is a frozen soil that has environmental gases trapped in it for several years. As the permafrost melts, it releases the gases back into the atmosphere increasing the earth's temperature.

- ***Forest Blazes***

Forest blazes or forest fires emit a large amount of carbon-containing smoke. These gases are released into the atmosphere and increase the earth's temperature resulting in global warming

Effects of Global Warming

Following are the major effects of global warming:

- Rise in Temperature
- Threats to the Ecosystem
- Climate Change
- Spread of Diseases
- High Mortality Rates
- Loss of Natural Habitat

Ozone Layer Depletion

Ozone layer depletion is the thinning of the ozone layer present in the upper atmosphere. This happens when the chlorine and bromine atoms in the atmosphere come in contact with ozone and destroy the ozone molecules. One chlorine can destroy 100,000 molecules of ozone. It is destroyed more quickly than it is created.

Some compounds release chlorine and bromine on exposure to high ultraviolet light, which then contributes to the ozone layer depletion. Such compounds are known as Ozone Depleting Substances (ODS).

The ozone-depleting substances that contain chlorine include chlorofluorocarbon, carbon tetrachloride, hydrochlorofluorocarbons, and methyl chloroform. Whereas, the ozone-depleting substances that contain bromine are halons, methyl bromide, and hydro bromofluorocarbons.

Chlorofluorocarbons are the most abundant ozone-depleting substance. It is only when the chlorine atom reacts with some other molecule, it does not react with ozone.

Montreal Protocol was proposed in 1987 to stop the use, production and import of ozone-depleting substances and minimize their concentration in the atmosphere to protect the ozone layer of the earth.

Causes of Ozone Layer Depletion

The ozone layer depletion is a major concern and is associated with a number of factors. The main causes responsible for the depletion of the ozone layer are listed below:

- Chlorofluorocarbons
- Unregulated Rocket Launches
- Nitrogenous Compounds
- Natural Causes

Effects of Ozone Layer Depletion

The depletion of the ozone layer has harmful effects on the environment. Let us see the major effects of ozone layer depletion on man and environment.

- Effects on Human Health
- Effects on Animals
- Effects on the Environment
- Effects on Marine Life
- Solutions to Ozone Layer Depletion

Following are some points that would help in preventing this problem at a global level:

Avoid Using Pesticides

Minimize the Use of Vehicles

United Nations Conference on the Human Environment (Stockholm Conference)

The United Nations Conference on the Human Environment (also known as the Stockholm Conference) was an international conference convened under United Nations auspices held in Stockholm, Sweden from June 5-16, 1972. It was the UN's first major conference on international environmental issues, and marked a turning point in the development of international environmental politics.

The 1972 United Nations Conference on the Environment in Stockholm was the first world conference to make the environment a major issue. The participants adopted a series of principles for sound management of the environment including the Stockholm Declaration and Action Plan for the Human Environment and several resolutions.

The Stockholm Declaration, which contained 26 principles, placed environmental issues at the forefront of international concerns and marked the start of a dialogue between industrialized and developing countries on the link between economic growth, the pollution of the air, water, and oceans and the well-being of people around the world.

The Action Plan contained three main categories: a) Global Environmental Assessment Program (watch plan); b) Environmental management activities; (c) International measures to support assessment and management activities carried out at the national and international levels. In addition, these categories were broken down into 109 recommendations.

One of the major results of the Stockholm conference was the creation of the United Nations Environment Programme (UNEP).

KYOTO PROTOCOL

- The Kyoto Protocol is an international treaty which extends the 1992 United Nations Framework Convention on Climate Change (UNFCCC)
- The main goal of Kyoto Protocol is to control emissions of the main anthropogenic greenhouse gases.
- It was signed in Kyoto, Japan on 11 December 1997 and entered into force on 16 February 2005.
- Carbon Dioxide, Methane, Nitrous Oxide, Perfluorocarbons, Hydro-fluorocarbons and Sulfur Hexafluoride. These six gases were known to be causing global warming and the main aim of the Kyoto Protocol was to reduce the amount of emission of these greenhouse gases.
- The principle of the protocol based common but differentiated responsibilities.
- The responsibilities acknowledges that individual countries have different capabilities in combating climate change, owing to economic development, and therefore puts the obligation to reduce current emissions on developed countries on the basis that they are historically responsible for the current levels of greenhouse gases in the atmosphere.
- The officials divided the countries into parts namely annex 1 and annex 2. So annex 1 consisted of developed countries and the developing countries were put in annex 2.
- The main goal of the Kyoto Protocol was to decrease emission level by 5.2% on an average of 1990 level.
- The process of reduction was scheduled in the commitment period
- The Protocol's first commitment period started in 2008 and ended in 2012.
- The Kyoto Protocol came into force in the year 2005 when 55 of the participants of Annex I sanctioned the Protocol. Those 55 countries actually resulted in 60% of total greenhouse gases emission in the year of 1990.
- The 2nd commitment period was started in 2013. US and Canada withdrew from it.
- There are 28 articles in Kyoto Protocol. Each article tells different rules and regulations.

The Earth Summit

The United Nations Conference on Environment and Development (UNCED), also known as the Rio de Janeiro Earth Summit, the Rio Summit, the Rio Conference, and the Earth Summit (Portuguese: ECO92), was a major United Nations conference held in Rio de Janeiro from 3 to 14 June in 1992.

Earth Summit was created as a response for Member States to cooperate together internationally on development issues after the Cold War. Due to issues relating to sustainability being too big for individual member states to handle, Earth Summit was held as a platform for other Member States to collaborate. Since the creation, many others in the field of sustainability show a similar development to the issues discussed in these conferences, including non-governmental organizations (NGOs).

The issues addressed included:

- systematic scrutiny of patterns of production — particularly the production of toxic components, such as lead in gasoline, or poisonous waste including radioactive chemicals
- alternative sources of energy to replace the use of fossil fuels which delegates linked to global climate change
- new reliance on public transportation systems in order to reduce vehicle emissions, congestion in cities and the health problems caused by polluted air and smoke
- the growing usage and limited supply of water

An important achievement of the summit was an agreement on the Climate Change Convention which in turn led to the Kyoto Protocol and the Paris Agreement. Another agreement was to "not to carry out any activities on the lands of indigenous peoples that would cause environmental degradation or that would be culturally inappropriate".

The Convention on Biological Diversity was opened for signature at the Earth Summit, and made a start towards redefinition of measures that did not inherently encourage destruction of natural ecoregions and so-called uneconomic growth.

Twelve cities were also honoured by the Local Government Honours Award for innovative local environmental programs. These included Sudbury in Canada for its ambitious program to rehabilitate environmental damage from the local mining industry, Austin in the United States for its green building strategy, and Kitakyūshū in Japan for incorporating an international education and training component into its municipal pollution control program.

The Earth Summit resulted in the following documents:

- Rio Declaration on Environment and Development
- Agenda 21
- Forest Principles

AGENDA 21

- Agenda 21 is an action plan of the United Nations with regard to sustainable development.
- It is a product of earth summit (UN conference on environment and development) held in Rio de Janeiro, Brazil in 1992

- It is also for multilateral organizations and individual governments around the world.
- The '21' in agenda 21 refers to the 21st century. Its aim is achieving global sustainable development.
- It is an immense document of 40 chapters outlining an 'action plan' for sustainable development, covering a wide range of specific natural resources and the role of different groups, as well as issues of social and economic development and implementation.
 - The 40 chapters that have been grouped in 4 sections.
 - Section 1 - social and economic dimensions (combating poverty, promoting health)
 - Section 2- conservation and management resources for development (atmospheric protection, deforestation, biodiversity)
 - Section 3- strengthening the role of major group.
 - Section 4- means of implementation (include science technology and education)

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