Geography Optional - 2023 - 24

ENVIRONMENTAL MANAGEMENT AND ISSUES RELATED TO ENVIRONMENT POLLUTION

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Rapid movement of industrialization throughout the world has been seriously menacing mankind's ability to maintain an ecological balance. Industrialization is the prerequisite of economic growth of any country; but unplanned industrialization and release of waste by industries brings environmental pollution or degradation. Every developmental activity directly relates to natural and environmental resources. Economic development without environmental considerations causes to environmental crises. The ecological role played by corporate sectors responsible for their business activities on the environment is becoming particularly explicit in the global market, especially in India. Management of both environmental and natural resources in a country like India has become more urgent. Every industry feels the necessity of sustainable development management. In addition, global awareness and acceptance of the importance of environmental issues has motivated the development of a new area of management known as "Corporate Environmental Management". Environmental management system is a part of the overall management system. The destructive influence of man's economic activities on the environment in the name of sustainable global economy is not of recent origin. concept of environmental management

In India, government has come forward to exercise control over the issue relating to degradation of environment. It is worth mentioning in this respect that the Indian constitution imposes as one of the fundamental duties of every citizen, the duty to protect and improve the natural environment including forests, lakes, rivers and wild life and to have compassion for living creatures.

Environmental Management – Concept

Environmental Management is entirely an emerging and dynamic concept. Environmental Management is concerned with the management for environment encompassing a business. It represents the organizational structure, responsibilities sequences, processes and preconditions for the implementation of an environmental corporate policy. Environment brings together all inanimate organism and forces functioning in nature including man. The basic functions of good environmental management are goal setting; information management; support of decision making; organizing and planning of environmental management; environmental management

programs; piloting; implementation and control; communication; internal and external auditing, etc. The present state of economic development, including the environmental state, makes it necessary to broaden management's understanding of natural environment. The way of industrialization being emphasized for the development of economy, in coming year's environmental pollution will be the ecological nightmare. Hence, it has become imperative to take into account the ecological consequences while setting up an industrial unit. Technology is available today to reduce the environmental pollution and it must be used to correct the excesses of ecological brutality and to minimize the degree of environmental degradation. For all these, a proper accounting and reporting of environmental information is a must which can lead to sound "Environmental Management".

Importance of Environmental Management

Environment takes into consideration all conditions required for the survival .Absence of environmental consideration causes serious ecological damage. Poverty, lack of resources, population pressure and global inequity of the resource use are generating unparalleled social and environmental problems at national and global levels. Sustainable development has a tendency to strike a balance between the demands of economic development and the need for management of environmental processes. Precise knowledge of various facets of sound environmental management is the sine qua non for sustainable development which meets not only the requirements of the present generation but also of the future generation. Environmental management is especially valuable for internal management initiatives with a specific environmental focus, such as cleaner production, supply chain management, "given" product or service design, environmentally preferable purchasing and environmental management systems. Environmental management type information is increasingly being used for external reporting purposes also. Environmental Management Accounting (EMA) is one of the environmental management tools. EMA provides a broad set of principles and approach required for the success of many other environmental management functions and since the range of decisions affected by environmental issues is gradually increasing, EMA is becoming more important not only for environmental management decisions, but for all types of managerial functions with special emphasis on eco-efficiency and strategic position. concept of environmental management

As a result, environmental management helps corporate and other organizations boost their

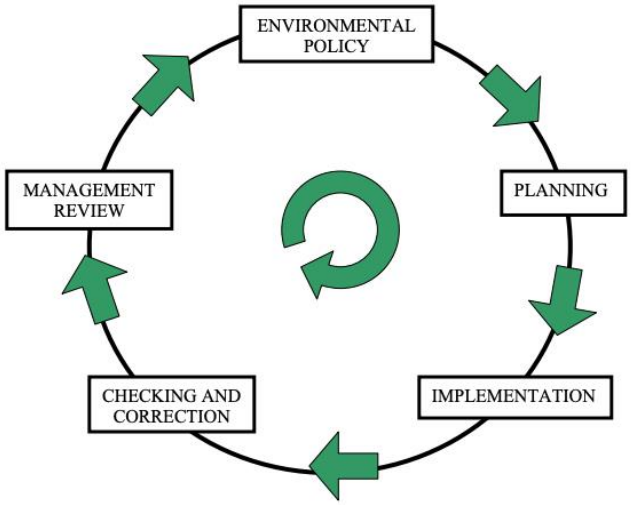
public trust and confidence and are related to receiving a fair assessment. The already degraded environment calls for its diligent management. Through environmental management, enterprises can enjoy the following benefits: concept of environmental management.

- Pollution control being burning subject of discussion, environmental management shows the extent to which pollution has been controlled by the corporate.
- Environmental management draws attention in another sense, which offers an idea about industrial development, a nation's economic progress and social welfare and the fulfillment of responsibility towards society.
- Environmental management is helpful in discharging organizational accountability and increasing environmental transparency. Sustainable development is possible with the help of environmental management as it helps include ecological ability of enterprise.
- Negotiation between the management and society helps organizations seek to strategically mange a fresh and emerging issue with distinct users.
- Environmental management supports green reporting to combat effectively all negative public opinions in the global economy where existence of a strong environmental lobby against environmentally unfriendly industries is found.
- Environmental management improves performance through better management of environmental cost and thus, benefits the natural and human environments.
- Environmental management forces corporate sectors to fulfill their commitments towards introduction and change, and thus appears to be responsive to new factors. Countries giving importance to the ecological aspect of activities are becoming more and more popular, particularly in Western Countries.
- Environmental management reflects unsound production and consumption patterns, misuse and scanty use of resources and assets like water.
- Optimal allocation of scanty resources in the economy is possible with the help of environmental management.
- Environmental management is essential in measuring a nation's economic development, social welfare, industrial development, pollution control and in fulfilling the needs of government, still the system is in its infancy and not all countries have been able to develop such a system. But with the passage of time, the system will gradually develop, research will be undertaken and it will fulfill the requirements for which it was originated.
- Impressive decision taking through the application of environmental management reduces or eliminates many environmental problems.

In the light of evolutionary learning, it is considered essential to make an endeavor to incorporate the effects of environmental resources in the entire business functions of a business house. Environmental management through environmental accounting is an attempt to identify the

resources consumed and the costs imposed on the environment by a corporate. Every corporate citizen should evaluate an environmental management system through environmental accounting to keep records of the benefits and costs rendered by the environment of a corporate and justifying these costs and benefits are large constituents of environmental accounting which in turn, nourishes a corporate development and operation for an all-round environmental management system. Maintaining secrecy and widely following different accounting systems sometimes make the task very difficult. But still, environmental management is highly useful in planning, public resource management, pollution control and for policy analysis.

The responsibilities of accountants in environmental management cannot be denied. An accountant should create environmental consciousness in the corporate sectors from top level to bottom level so that the environmental culture may be installed and their cooperation may be sought for in enforcing it. Every staff in the corporate sector must be made aware of the importance of environmental quality management. The management accountant has an important role in uttering this principle or mantra in every walk of corporate life. Corporate agenda should be prepared and the following may be incorporated there: concept of environmental management.



- Corporate commitment to environmental protection should be clearly stated;
- Environmental protection is a genuine task and no stone will be left unturned in preserving and safeguarding ecological balances;
- Environmental friendly code of conduct must be noticed at all levels and by all the people;
- Employees failing to observe environmental friendly code of conduct must be reprimanded;
- Alteration in product design should be made as far as possible to incorporate eco-friendly materials and other inputs;
- Renewable sources of energies like solar energy, wind energy, etc. must be used and so advocated;
- Maintenance, replacement and repairs of machinery, tools, equipment, vehicles, etc. should be done properly and in time;
- Arrangement for returning or collecting back non-biodegradable packing materials must be used to the best possible extent;

- If the working of the corporate on any day or in any month is against environmental interest, staff doing this must seek apology;
- Installation of adequate waste and sewage plants before the industrial wastages are left into river, sea, etc. may be made;
- Adequate number of PROs to communicate with the external world and to clear the corporate commitment to the world at large must be recruited;
- Environmental engineers must be recruited for seeking their opinion on environmental related matters and for involvement in establishing a cleaner and efficient production system thereby minimizing wastage and ensuring optimum usage of all the raw materials;
- Corporate manager should be proactive rather than active. The adequate measures must be initiated to protect environment before the new technology is put to use or adopted;
- Participation in activities like social forestry, community forest efforts, environment cleaning works, etc. may be made;
- R&D activities for identifying new processes or methods of production or inputs which are sustainable from environmental point of view should be encouraged.

The aforesaid corporate environmental agenda should be drafted by the management accountant and implemented in and outside the corporate with full support of the top management. The management accountant as far as environmental matters are concerned can be taken as the "spokesperson" who represents the environment. Regular environmental performance reports, environmental laws and changes in them, periodical environmental audit by independent agencies, etc. should be brought to the notice of all concerned in the corporate to ensure genuine environment to protect the environment. concept of environmental management

Environmental balance sheet usually includes the following: concept of environmental management

Environmental Assets: Water pollution treatment plants; Sewage treatment plants; Air pollution preventive systems; Investment in Social forestry; Human Training and Development cost; Capital work-in-progress; Renewable energy sources; Eco-friendly production machines; Packaging materials etc. The above assets are required to control environmental degradation.

Environmental Liabilities: Amount of compensation payable according to court rulings; NGOs' rulings; Pending Law suits against environmental hazards; Amount of damages yet to be assessed, etc. Environmental liabilities are actually the obligations payable or incurred in discharge of environmental responsibilities by a corporate. These liabilities can highly influence the corporate financial status. A positive financial net worth could be converted into negative one if the working of the corporate is at the cost of environmental protection. It is, therefore, essential to assess them properly in determining environmental capital. The objective of any corporate is

to minimize its environmental liabilities by being friendly to its environment. Green capital takes place when environmental investments exceed the environmental liabilities.

It is desirable that environmental capital should be equal to environmental liabilities. Environmental balance sheet is an indispensable part of yearly financial accounts. Necessary legal provisions may be made to make it mandatory for the corporate. Further, Courts, NGOs, Consumer Forums, Environmental and Social workers and other environmental organizations should strive for necessary morale persuasion on the corporate management to prepare and publish the amount of Green Capital investment in environmental protection.

Benefits of Environmental Management Accounting

Environmental Management Accounting (EMA) has no single univocally accepted definition. EMA is the management of environmental and economic performance with the help of development and execution of appropriate environmentally related accounting system and practices. EMA typically includes reporting, auditing, life-cycle costing, full-cost accounting benefits assessment and strategic planning for environmental management. EMA identifies collects, analyses and uses of two types of information for internal decision making purpose viz. 1. Physical information on the use, flows and destinies of energy, water and materials (including wastes) and 2. Financial information on environment related costs, earnings and savings. Although EMA brings light basically on internal management decision making, physical accounting information also is often reported to external stakeholders. concept of environmental management.

Environmental Awareness in India

Environmental management through environmental accounting shows the extent of pollution controlled by business entities. Man has been rapidly and deliberately exploiting the environmental resources with the aid of modern science and technology. Industrialization is genuine for life, but evils accompanying it are also no less in number. The most outstanding and patent danger that emerges from the industrial activities is pollution. In underdeveloped countries, pollution is not the serious problem as it is in technologically developed countries of the world. In well-developed nations and the greatest technologically advanced countries, the worst pollution happens. The industrialization is mainly concerned with physical environmental pollution (i.e. air, water and noise). Most of the Indian rivers and fresh water streams are seriously polluted by industrial wastes or elements of different industries causing waterborne diseases. Unplanned urbanization, construction of water projects, and migration of people – everything helps change the ecology and epidemiology of diseases. India is the third largest producer of tobacco in the world after the US and China. The Government of India has done little to control or reduce smoking because of conflicting loyalties, the need of the exchequer and the health of the people. Today unfortunately, urban ecology is no sounder and is poised with

health hazards and impaired human activity, due to low per capita availability of land. Environment and animal are both polluting each other. Untreated hospital wastes in the garbage places are endangering the health of both animal and man. Drossy animals on the urban roads are exposed to serious chemical pollution from automobile exhausts that lour their health, productivity and also reproductive efficiency. Environmental pollution in India is a serious problem now and serious efforts are being made to orient the public in its protection.

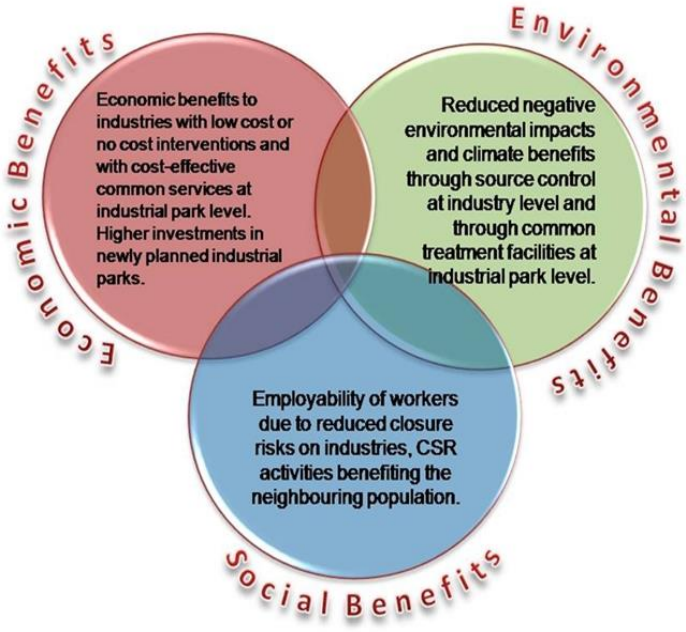


Fig: Benefits from Sustainable Development Approach

The administration of pollution control has been gloomy due to want of reliable information on the violation and implementation of these regulations. In India, we are not better off. The worst polluting company appears to be the most successful and attracts additional investment from an investing public . Measuring the inter-relationship between environment and development has become a complicated issue mainly because the current national accounting does not only consider the value of natural resources. The problem of environmental protection is becoming more and more acute and the necessity for considering the value of services of environmental resources is also gradually increasing day by day. Monetary values allotted to environmental goods and services under the shadow pricing process are not certain and inadequately quantified. Many conditions and assumptions lying under economic theory are not encountered. International firms and organizations had a tendency to disclose non-monetary information including environmental information; naturally, they have enhanced the expectations from Indian corporate to act responsively towards the environment and be accountable to society beyond the traditional role of providing financial accounts to shareholders. Usually, literature available as to environmental performance reporting has concentrated on developed countries and little attention has been given to the states of environmental reporting of developing countries. So far, no accounting standard has been issued extensively for accounting treatment of the aforesaid problems. Though some guidelines in regard to these problems have been issued by many organizations internationally, but these guidelines are mostly advisory in nature. A large number of countries impose requirements on corporate to report on their environmental performance, in India, corporate are required to prepare a so-called “Green Account”. Absence

of comprehensive and verifiable information and financial data on environmental performance of companies sometimes induce them to pollute the environmental and yet appear more efficient economically than others which incur costs to protect the environment. The economics approach to environment issues as reflected in some countries opines that companies in unscrupulous pursuit of profits can do much social harm and the environment suffers. Environmental management is not effectively followed in India. Environmental aspects in India are so significant to a company that there is every possibility or risk for the occurrence of significant misrepresentation or inadequate or incomplete presentation of such information within financial statements concept of environmental management.

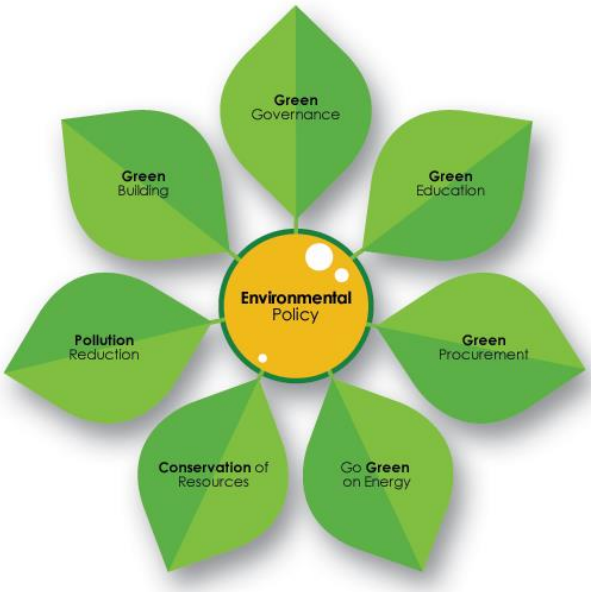
Awareness

Laws for the preservation of environment were passed in India in 1970,in favor of the environment at the United Nation's Conference on the human environment in Stockholm, 1972. Diverse rules, laws, etc. have been enacted from time to time.

Environmental management through keeping of accounts and records with the help of environmental accounting would be beneficial to hinder exploitation of natural resources and prevent their depletion. The Environmental Reporting Practices of the corporate sectors in India are not satisfactory; very few corporate entities have some mention about the environment in general terms. Most of the corporate entities have taken reporting on environmental aspects under more statutory obligations and less social responsibility. The statutory provisions about reporting on environment protection are not adequate to submit true and fair information about the consequences of corporate operation on environment. Although environmental management through environmental accounting and reporting is voluntary exercise in India, the organizations preferring to exhibit environmental issues in their statements enjoy several benefits such as improved image of the product or corporate.

Conclusion

Environment being an essential part of every body's living is said to be true even for legal entities i.e. corporate. The corporate living should not destroy environment balance sheet rather it should largely contribute for sustainable development of a country. concept of environmental management. The social values placed on environmental goods and services are changing so rapidly that estimates are likely to be obsolete before they are available for use. Planning for sustainable development requires an estimate of environmentally adjusted GNP. However, despite the theoretical irregularities, the slogan for environmental management and environmental accounting has won perpetual benefit inherent in it. In addition, growing awareness and acceptance of the importance of natural and environmental resources globally and nationally has laid to the development of environmental management. Valuation of environmental goods and services and incorporation of environmental data into the national and corporate levels suggest different techniques. In many countries, the disclosure practices in regard to environmental issues have become mandatory. But in some countries, such mandate is not everywhere. Taking step internationally and particularly to formulate valuation techniques regarding environmental issues is now an urgent need. Mandatory guidelines can be issued in each and every country to incorporate these in the company's annual report including environmental related legislation as in developed countries.



The dedication with which work for the development of environmental management is going on will surely lead to environmental management occupying a more stable and efficacious position in the coming future, as it could greatly improve the value of economics as a decision-making tool, especially in determining national policy. The implementation of environmental management is expected to bring about a change in the managerial attitudes and thinking. Despite difficulties associated with environmental management, there is much evidence to show that a large number of countries around the world have sincerely attempted to pick-up the new challenges and threats. Economic activity should not be guided by 'profit motive' alone, but should also include "quality of life" and "ecological balance". The key to sustainable growth, therefore, is not to provide less but to provide efficiently with the help of environmental management system.

Issues related to environment pollution

Pollution occurs when pollutants contaminate the natural surroundings; which brings about changes that affect our normal lifestyles adversely. Pollutants are the key elements or components of pollution which are generally waste materials of different forms. Pollution disturbs our ecosystem and the balance in the environment. With modernization and development in our lives pollution has reached its peak; giving rise to global warming and human illness.

Pollution occurs in different forms; air, water, soil, radioactive, noise, heat/ thermal and light. Every form of pollution has two sources of occurrence; the point and the non-point sources. The point sources are easy to identify, monitor and control, whereas the non-point sources are hard to control

The Central Pollution Control Board (CPCB)

CPCBisstatutory 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, are

- to promote cleanliness of streams and wells in different areas of the States by prevention, control and abatement of water pollution, and

- to improve the quality of air and to prevent, control or abate air pollution in the country.

Water (Prevention and Control of Pollution) Act, 1974

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 are 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.CPCB has been assigned following functions at National Level :

- Advise the Central Government on any matter concerning prevention and control of water and air pollution and improvement of the quality of air;
- Plan and cause to be executed a nationwide program for the prevention, control or abatement of water and air pollution;
- Coordinate the activities of the State Boards and resolve disputes among them; Provide technical assistance and guidance to the State Boards, carry out and sponsor investigations and research relating to problems of water and air pollution, and for their prevention, control or abatement;
- Plan and organize training of persons engaged in program for prevention, control or abatement of water and air pollution;
- Organize through mass media, a comprehensive mass awareness program on prevention, control or abatement of water and air pollution;
- Collect, compile and publish technical and statistical data relating to water and air pollution and the measures devised for their effective prevention, control or abatement;
- Prepare manuals, codes and guidelines relating to treatment and disposal of sewage and trade effluents as well as for stack gas cleaning devices, stacks and ducts;
- Disseminate information in respect of matters relating to water and air pollution and their prevention and control;
- Lay down, modify or annul, in consultation with the State Governments concerned, the standards for stream or well, and lay down standards for the quality of air;
- Establish or recognize laboratories to enable the Board to perform, and;
- Perform such other functions as and when prescribed by the Government of India.

RIVER STRETCHES FOR RESTORATION OF WATER QUALITY

Central Pollution Control Board is monitoring 445 rivers in 29 States and 6 Union Territories in the country. The monitored data is analyzed statistically and compared with the water quality criteria. The stretches of rivers not meeting with the criteria are identified as polluted stretches and categorized in five priority classes.

Based on BOD concentration stretches consistently exceeding to

- BOD levels >30 mg/l are categorized as Priority Class-I,
- BOD between 20 & 30 mg/l as Priority Class - II,
- BOD between 10 & 20mg/l as Priority Class-III,
- BOD between 6-10 mg/l as Priority Class –IV and
- BOD between 3 & 6 mg/l as Priority Class- V.

Groundwater Quality Monitoring Groundwater monitoring during the period 2014-15 was conducted at identified locations in Unnao, Varanasi, Kanpur & Allahabad districts. Total 68 samples were collected from Unnao, Sitapur, Varanasi, Raibareli, Unchahhar, Shajahanpur, Bareilly, Kanpur, Pilibhit, Allahabad &Chandauli. It was observed that the overall groundwater quality is not satisfactory with respect to electrical conductivity, TDS, total hardness, magnesium, turbidity and total hardness.

'**Namami Gange Programme',** is an Integrated Conservation Mission, approved as 'Flagship Programme' by the Union Government to accomplish the twin objectives of effective abatement of pollution, conservation and rejuvenation of National River Ganga.

Main pillars of the Namami Gange Programme

- Sewerage Treatment Infrastructure
- River-Front Development
- River-Surface Cleaning
- Bio-Diversity
- Afforestation
- Public Awareness
- Industrial Effluent Monitoring
- Ganga Gram

Its implementation has been divided into Entry-Level Activities (for immediate visible impact), Medium-Term Activities (to be implemented within 5 years of time frame) and Long-Term Activities (to be implemented within 10 years).

The key achievements under Namami Gange programme are:-

Creating Sewerage Treatment Capacity:- 63 sewerage management projects under implementation in the States of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal.12 new sewerage management Projects Launched in these states. Work is under

construction for creating Sewerage capacity of 1187.33 (MLD).Hybrid Annuity PPP Model based two projects has been initiated for Jagjeetpur, Haridwar and Ramanna, Varanasi.

Creating River-Front Development:-28 River-Front Development projects and 33 Entry level Projects for construction, modernization and renovation of 182 Ghats and 118 crematoria has been initiated.

River Surface Cleaning:-River Surface cleaning for collection of floating solid waste from the surface of the Ghats and River and its disposal are afoot and pushed into service at 11 locations.

Bio-Diversity Conservation:- Several Bio-Diversity conservation projects are namely: Biodiversity Conservation and Ganga Rejuvenation, Fish and Fishery Conservation in Ganga River, Ganges River Dolphin Conservation Education Programme has been initiated. 5 Bio-Diversity center's at Dehradun, Narora, Allahabad, Varanasi and Barrackpore has been developed for restoration of identified priority species.

Afforestation:- Forestry interventions for Ganga through Wildlife Institute of India; Central Inland Fisheries Research Institute and Centre for Environment Education has been initiated. Forestry interventions for Ganga has been executed as per the Detailed Project Report prepared by Forest Research Institute, Dehradun for a period of 5 years (2016-2021) at project cost of Rs.2300 Crores. Work has been commenced in 7 districts of Uttarakahnd for medicinal plants.

Public Awareness:- A series of activities such as events, workshops, seminars and conferences and numerous IEC activities were organized to make a strong pitch for public outreach and community participation in the programme. Various awareness activities through rallies, campaigns, exhibitions, shramdaan, cleanliness drives, competitions, plantation drives and development and distribution of resource materials were organized and for wider publicity the mass mediums such as TV/Radio, print media advertisements, advertorials, featured articles and advertorials were published. Gange Theme song was released widely and played on digital media to enhance the visibility of the programme.

Industrial Effluent Monitoring: - The number of Grossly Polluting Industries (GPIs) in April, 2019 are 1072. Regulation and enforcement through regular and surprise inspections of GPIs is carried out for compliance verification against stipulated environmental norms. The GPIs are also inspected on annual basis for compliance verification of the pollution norms and process

modification, wherever required through third party technical institutes. First round of inspection of GPIs by the third-party technical institutes has been carried out in 2017. Second round of inspection of GPIs has been completed in 2018. Out of 961 GPIs inspected in 2018, 636 are complying, 110 are non-complying and 215 are self-closed. Action has been taken against 110 non-complying GPIs and are issued closure directions under Section 5 of the E(P) Act. Online Continuous Effluent Monitoring Stations (OCEMS) connectivity established to CPCB server in 885 out of 1072 GPIs.

Ganga Gram:- Ministry of Drinking Water and Sanitation (MoDWS) identified 1674 Gram Panchayats situated on the bank of River Ganga in 5 State (Uttarakhand, UttarPradesh,Bihar,Jharkhand,West Bengal).

National Mission for Clean Ganga, endeavors to deploy best available knowledge and resources across the world for Ganga rejuvenation. Clean Ganga has been a perennial attraction for many international countries that have expertise in river rejuvenation. Countries such as Australia, United Kingdom, Germany, Finland, Israel etc. have shown interest in collaborating with India for Ganga rejuvenation. Memorandums of Understanding (MoUs) were signed with various Central Ministries viz.- Ministry of Human Resource Development, Ministry of Rural Development, Ministry of Railways, Ministry of Shipping, Ministry of Tourism, Ministry of Ayush, Ministry of Petroleum, Ministry of Youth Affairs and Sports, Ministry of Drinking Water & Sanitation and Ministry of Agriculture for synergizing the Government schemes.

National Air Quality Monitoring Programme (NAMP): Central Pollution Control Board is executing a nation-wide National Air Quality Monitoring Programme (NAMP).

Parameters monitored under NAMP Under NAMP three criteria pollutants viz.

- PM10 (Particulate Matter having aerodynamic diameter less than or equal to 10 µm),
- Sulphur dioxide (SO2) and
- Nitrogen dioxide (NO2) were identified for regular monitoring at all locations.

Other notified parameters like Carbon monoxide (CO), Ammonia (NH3), Ozone (O3), PM2.5 (Particulate Matter having aerodynamic diameter less than or equal to 2.5 µm), Benzo(a) pyrene {B(a)P}, Lead (Pb) and Nickel (Ni) are being monitored at selected locations.

The monitoring ***of meteorological parameters*** such as wind speed, wind direction, relative humidity and temperature has been also integrated with the monitoring of air quality. The monitoring under the NAMP is being carried out by Central Pollution Control Board with support from State Pollution Control Boards; Pollution Control Committees and National Environmental Engineering Research Institute (NEERI), Nagpur. CPCB co-ordinates with these agencies to ensure uniformity and consistency of air quality data besides providing technical and financial support for operating the monitoring station.

Status of Ambient Air Quality in million plus cities during 2018 Increase in industrial activities, population both endemic and floating and vehicular population etc. have led to a rapid increase in environmental problems, one of them being air pollution. An inventory of air pollutants is the first step towards control of air pollution. Air quality categories in cities of India CPCB depicts

ambient air quality in terms of low, moderate, high and critical levels by calculating an exceedence factor

The four air quality categories are:

- Critical pollution (C) : when EF is more than 1.5;
- High pollution (H) : when the EF is between 1.0 - 1.5;
- Moderate pollution (M) : when the EF between 0.5 - 1.0; and
- Low pollution (L): when the EF is less than 0.5.

National Mean Concentration of three regularly monitored pollutants

National mean of SO2 concentration over the years indicates a decline in SO2 levels. The decreasing trend may be due to various interventions that have taken place in recent years such as reduction in Sulphur level in diesel, use of cleaner fuel such as CNG in metro cities, change in domestic fuel from coal to LPG etc. National mean of NO2 concentration has remained stable over the years with a slight decrease in last three years despite increase in sources like vehicles. The reason for this may be various intervention that have taken place such as improvement in vehicle technology and other vehicular pollution control measures like alternate fuel etc. National mean of PM10 concentration shows fluctuating trend exceeding the NAAQS. The reasons being emission from gensets, small scale industries, biomass burning, suspension of traffic dust, natural dust, commercial and domestic use of fuel and vehicular emission etc. Furthermore, the increasing trend of PM10 may be attributed to the increasing number of vehicles and re-suspension of natural dust.

National Ambient Noise Monitoring Network (NANMN) Program

Noise is generated from a variety of indoor and outdoor sources such as industries, transport vehicles, construction activities, generator sets, fire crackers. The Noise Pollution (Regulation and Control) Rules, 2000 were notified by MoEF& CC under the Environment (Protection) Act 1986 and amended in January 2010. Database on noise level is required for policy formulation, setting standards and ensuring compliance of the existing rules. Existing Network: Central Pollution Control Board in association with State Pollution Control Board has established National Ambient Noise Monitoring Network covering 07 metropolitan cities and installed 35 no. of Noise Monitoring System in Mumbai, Delhi, Kolkata, Chennai, Bengaluru, Lucknow and Hyderabad (five stations in each). The Strengthening of the Network has been carried out by adding 35 more stations in the same 07 metropolitan during 2014-15. Thus extending the monitoring network to 70 stations.

Frequency of Monitoring: Ambient Noise Monitoring is carried out in Real Time mode continuously and data captured at central receiving station at CPCB, Delhi is made available on public domain as well as CPCB's website.

ENVIRONMENTAL IMPACT ASSESSMENT

Environment Impact Assessment or EIA can be defined as the study to predict the effect of a proposed activity/project on the environment. A decision making tool, EIA compares various alternatives for a project and seeks to identify the one which represents the best combination of economic and environmental costs and benefits.

What is EIA?

Environment Impact Assessment or EIA can be defined as the study to predict the effect of a proposed activity/project on the environment. A decision making tool, EIA compares various alternatives for a project and seeks to identify the one which represents the best combination of economic and environmental costs and benefits.

EIA systematically examines both beneficial and adverse consequences of the project and ensures that these effects are taken into account during project design. It helps to identify possible environmental effects of the proposed project, proposes measures to mitigate adverse effects and predicts whether there will be significant adverse environmental effects, even after the mitigation is implemented. By considering the environmental effects of the project and their mitigation early in the project planning cycle, environmental assessment has many benefits, such as protection of environment, optimum utilisation of resources and saving of time and cost of the project. Properly conducted EIA also lessens conflicts by promoting community participation, informing decision makers, and helping lay the base for environmentally sound projects. Benefits of integrating EIA have been observed in all stages of a project, from exploration and planning, through construction, operations, decommissioning, and beyond site closure.

Evolution of EIA

EIA is one of the successful policy innovations of the 20th Century for environmental conservation. Thirty-seven years ago, there was no EIA but today, it is a formal process in many countries and is currently practiced in more than 100 countries. EIA as a mandatory regulatory procedure originated in the early 1970s, with the implementation of the National Environment Policy Act (NEPA) 1969 in the US. A large part of the initial development took place in a few high-income countries, like Canada, Australia, and New Zealand (1973-74). However, there were some developing countries as well, which introduced EIA relatively early - Columbia (1974), Philippines (1978).

The EIA process really took off after the mid-1980s. In 1989, the World Bank adopted EIA for major development projects, in which a borrower country had to undertake an EIA under the Bank's supervision

History of EIA in India

The Indian experience with Environmental Impact Assessment began over 20 years back. It started in 1976-77 when the Planning Commission asked the Department of Science and Technology to examine the river-valley projects from an environmental angle. This was subsequently extended to cover those projects, which required the approval of the Public Investment Board. Till 1994, environmental clearance from the Central Government was an administrative decision and lacked legislative support.

On 27 January 1994, the Union Ministry of Environment and Forests (MEF), Government of India, under the Environmental (Protection) Act 1986, promulgated an EIA notification making Environmental Clearance (EC) mandatory for expansion or modernisation of any activity or for setting up new projects listed in Schedule 1 of the notification. Since then there have been 12 amendments made in the EIA notification of 1994.

The MoEF recently notified new EIA legislation in September 2006. The notification makes it mandatory for various projects such as mining, thermal power plants, river valley, infrastructure (road, highway, ports, harbours and airports) and industries including very small electroplating or foundry units to get environment clearance. However, unlike the EIA Notification of 1994, the new legislation has put the onus of clearing projects on the state government depending on the size/capacity of the project.

Certain activities permissible under the Coastal Regulation Zone Act, 1991 also require similar clearance. Additionally, donor agencies operating in India like the World Bank and the ADB have a different set of requirements for giving environmental clearance to projects that are funded by them.

The EIA process

The stages of an EIA process will depend upon the requirements of the country or donor. However, most EIA processes have a common structure and the application of the main stages is a basic standard of good practice.

The environment impact assessment consists of eight steps with each step equally important in determining the overall performance of the project. Typically, the EIA process begins with screening to ensure time and resources are directed at the proposals that matter environmentally and ends with some form of follow up on the implementation of the decisions and actions taken as a result of an EIA report. **The eight steps of the EIA process are presented in brief below:**

- Screening: First stage of EIA, which determines whether the proposed project, requires an EIA and if it does, then the level of assessment required.
- Scoping: This stage identifies the key issues and impacts that should be further investigated. This stage also defines the boundary and time limit of the study.
- Impact analysis: This stage of EIA identifies and predicts the likely environmental and social impact of the proposed project and evaluates the significance.
- Mitigation: This step in EIA recommends the actions to reduce and avoid the potential adverse environmental consequences of development activities.
- Reporting: This stage presents the result of EIA in a form of a report to the decision-making body and other interested parties.
- Review of EIA: It examines the adequacy and effectiveness of the EIA report and provides the information necessary for decision-making.

- Decision-making: It decides whether the project is rejected, approved or needs further change.
- Post monitoring: This stage comes into play once the project is commissioned. It checks to ensure that the impacts of the project do not exceed the legal standards and implementation of the mitigation measures are in the manner as described in the EIA report. Forms of impact assessment

There are various forms of impact assessment such as Health Impact Assessment (HIA) and Social Impact Assessment (SIA) that are used to assess the health and social consequences of development so that they are taken into consideration along with the environmental assessment. One of the forms of impact assessment is strategic environment assessment, which is briefly discussed below:

Strategic Environment Assessment (SEA) refers to systematic analysis of the environmental effects of development policies, plans, programmes and other proposed strategic actions. This process extends the aims and principles of EIA upstream in the decision-making process, beyond the project level and when major alternatives are still open. SEA represents a proactive approach to integrating environmental considerations into the higher levels of decision-making.

Despite its wide use and acceptance, EIA has certain shortcomings as a tool for minimising environmental effects of development proposals. It takes place relatively late at the downstream end of the decision making process, after major alternatives and directions have been chosen . SEA had limited development and implementation till 1990. However, after 1990, a number of countries in developed economies adopted SEA. Some countries such as Canada and Denmark have made provision for SEA of policy, plans and programmes separately from EIA legislation and procedure.

Other countries such as Czech Republic, Slovakia, etc have introduced SEA requirements through reforms in EIA legislation and in case of United Kingdom through environmental appraisal. While in New Zealand and Australia, it is a part of resource management or biodiversity conservation regimes.

The adoption of SEA is likely to grow significantly in the coming years especially with directives by European Union and Protocol to the UNECE Convention on Trans boundary EIA by signatory countries.

Strategic Environmental Assessment (SEA) is the process of predicting and evaluating the impact of a strategic action on the environment, and using that information in decision-making. SEA is basically environmental impact assessment of strategic actions: policies, plans and program. Environmental impact assessment of projects is the starting point for SEA, but EIA and SEA have some key differences:

Difference in EIA and SEA

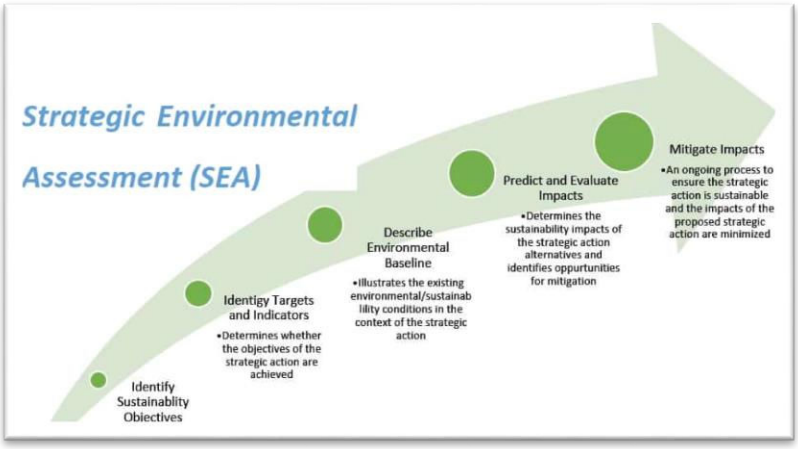
• Environment impact assessment	Strategic environment assessment
• Takes place at end of decision-making cycle • Reactive approach to development proposal • Identifies specific impacts on the environment • Considers limited number of feasible alternatives • Limited review of cumulative effects • Emphasis on mitigating and minimizing impacts • Narrow perspective, high level of detail • Well-defined process, clear beginning and end • Focuses on standard agenda, treats symptoms of environmental deterioration	• Takes place at earlier stages of decision making cycle Pro-active approach to development proposals • Also identifies environmental implications, issues of sustainable development • Considers broad range of potential alternatives • Early warning of cumulative effects • Emphasis on meeting environmental objectives, maintaining natural systems • Broad perspective, lower level of detail to provide a vision and overall framework • Multi-stage process, overlapping components, policy level is continuing, iterative • Focuses on sustainability agenda, gets at sources of environmental deterioration

Strategic Environmental Assessment of Policies, Plans and Program

- Takes place at earlier stages of decision-making cycle: aims to prevent impacts
- Pro-active approach to development proposals
- Considers broad range of potential alternatives
- Cumulative effects assessment is key to SEA
- Emphasis on meeting environmental objectives, maintaining natural systems
- Broad perspective, lower level of detail to provide a vision and overall framework
- Multi-stage process, overlapping components, policy level is continuing, iterative
- Focuses on sustainability agenda, gets at sources of environmental deterioration

EIA of Projects

- Takes place near the end of decision-making cycle: aims to minimize impacts
- Reactive approach to development proposal
- Considers limited number of feasible alternatives
- Limited review of cumulative effects
- Emphasis on mitigating and minimizing impacts
- Narrow perspective, high level of detail
- Well-defined process, clear beginning and end
- Focuses on standard agenda, treats systems of environmental deterioration



Limitations of EIA

- EIA takes place once many strategic decisions have already been made, it can often address only a limited range of alternatives and mitigation measures: those of a wider nature are generally poorly integrated into project planning.
- Consultation in EIA is also limited and the contribution of EIA to the eventual decision regarding the project is unclear.
- Although project EIA is widely used and accepted as a useful tool in decision-making, it largely reacts to development proposals rather than proactively anticipating them
- Project EIAs are also generally limited to the project's direct impacts. This approach ignores a wide range of impacts, including:
- **Cumulative impacts:** the environmental impacts of multiple plans, projects and other actions
- **global impacts**: impacts that go beyond the local, project level, for instance climate change
- **indirect, secondary or induced impacts:** impacts that occur several steps away from the original action, for instance new houses that generate more vehicle movements that increase air pollution that affect the flora in an area
- **Synergistic impacts**: where impact A + impact B have a total impact of more than A+B: for instance, NOx emissions and ozone emissions which together cause smog, which has impacts over and above those of just the NOx + ozone.

Strategic Environmental Assessment can deal with many of these difficulties, as it:

1. incorporates environmental issues into project planning and decision making;
2. considers alternatives or mitigation measures beyond project level
3. involves consultation on more strategic issues

Promotion of sustainable development

- SEA is that it can enhance the integration of environmental concerns in policy and planning processes, thereby helping to implement **sustainable development.**
- It can help to ensure that environmental and sustainability criteria are fully considered throughout the planning process, for instance in the identification of suitable (or unsuitable) locations for development, and in the assessment of alternative strategic actions.

- **Identify Sustainability Objectives** – Ensures that issues of ESD are incorporated at the earliest stage of decision making in the process
- **Identify Targets and Indicators** – Determines whether the objectives of the strategic action are achieved
- **Describe Environmental Baseline** – Illustrates the existing environmental/sustainability conditions in the context of the strategic action
- **Predict and Evaluate Impacts** – Determines the sustainability impacts of the strategic action alternatives and identifies opportunities for mitigation
- **Mitigate Impacts** – An ongoing process to ensure the strategic action is sustainable and the impacts of the proposed strategic action are minimized
- **Write SEA Report** – Documents the strategic action, and the Strategic Environmental Assessment process, results and decision making
- **Establish Environmental Guidelines**
- **Monitor Environmental Impacts**

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