

Unique characteristics

Introduction:-

Technological innovation and Economic growth in the 20th century have led to significant improvement of human welfare; however, they also cause unprecedented environmental problems. These problems include not only local/regional environmental pollution but also global issue such as climate change, resource shortages, the Energy Crisis and loss of biodiversity etc. Environmental problem is complex because it relates not only to a technical/physical issue but also social issues.

Environmental problems are often multidisciplinary multi-faceted and complex by nature, consisting of diverse, intertwined dimensions. A unique characteristic of Environmental Problem are

- * Uncertainties
- * Cause - Effect mismatches
- * Norm plurality
- * Interdisciplinary character

Environmental problems are often multifaceted and complex by nature comprising diverse intertwined dimensions.

1) Uncertainty

Most environmental problems that emerge due to human activities are accompanied by a non-trivial degree of uncertainty. Typical examples include climate change, nuclear waste and micro pollutants in water. Problems such as there may arise uncertainties about their causes and effects (i.e., about what to govern), as well as appropriate response strategies (i.e., how to govern).

These type of uncertainty can be distinguished

↳ unpredictability (unpredictable system behaviour)

↳ incomplete knowledge (lack of information, unreliable information)

↳ multiple knowledge [conflicting interpretations of frames human environmental relations]

2) Mismatches across sectors, levels, space and time i.e., cause and effect mismatch.

An important characteristic of many environmental problems is a mismatch between those who create the problems and those forced to deal with consequences. This mismatch can lead to uneven distributional effects across sectors, levels, space or time.

⇒ ~~cause~~ This type of characteristic is observed in following case

a) different sources and sectors might generate environmental problems, while their consequence may might affect different part of society

b) environmental problems can have multi-level and spatial dimensions, while some arise on local level (sound pollution), others transboundary in nature (e.g., water quality & safety), can have global dimension.

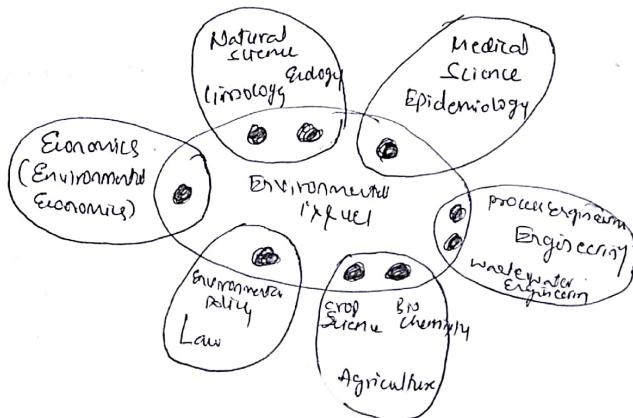
c) many environmental problems occur after a substantial delay.

3) Plurality of norms, values and interests
A key challenge accompanying environmental problems is how they are framed (or) perceived. Frames are interpretations of complex phenomenon that help us to understand them.

When people label phenomenon, they give meaning to some aspects while disregarding others as less important. Difference in problem frames are caused not only by different knowledge being on even lack of knowledge, but also by difference in interests, beliefs (or) worldviews.

Farmers, for instance, sometimes have different views of biodiversity protection than Ecologists (or) government representatives. It can lead to confrontations, to discussions, to mutual learning & ultimately to common perspective. It can be solved by connecting different problem frames i.e., connecting different frames through network connection

ii) interdisciplinary characteristic



Corporate Environmental Management :-

* Corporate Environmental responsibility is about managing the use of natural resources in the most effective and efficient manner in order to reduce environmental impacts and financial costs.

* Here we discuss about various activities undertaken by companies for Environment management under CSR (Corporate social responsibility) include water conservation, Tree plantation, developing green products, using renewable sources of energy and waste management.

The three main elements/purpose of corporate Environmental management are

- * Eliminate waste and Emissions
- * Maximize the Efficient use of resources and productivity
- * Minimize the activities that might impair the enjoyment of resources by future generations .

The ultimate aim of corporate Environmental management must be to reach a situation where Companies are operating in a way which is consistent with concept of sustainable development.

one key idea which lies behind the concept of sustainable development is that there is trade off between long - term Economic growth and the sustainability of Environment.

Sustainable development stresses the interdependence between Economic growth and Environmental quality. It is possible to make development and Environmental protection compatible by following Sustainable strategies

strategies and by not developing the particular areas of economic activity that are most damaging to the environment.

Systems approach to Corporate Environmental management:-

There are two approaches of managing the Environment

- i) preservative approach
- ii) conservative approach.

According to the first approach, man should not disturb natural system and should adapt to it. But this is not possible because for all types of developmental activities he will have to use nature and its components, resulting in eco-imbalance of varied intensity.

The conservative approach is that there should not be overexploitation of nature and conservation of natural resources is essential for sustainable development. In fact, proper utilization and conservation of resources is the prime objective of Environmental management.

The best approach to Environmental management is an integrated approach in which all the components of Environment are taken into consideration and its proper management, as a whole is done.

In recent years, several approaches have been developed for the management of Environment

(C.P.T.O.)

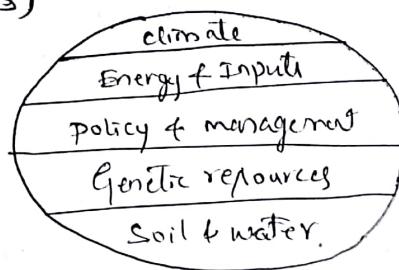
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The various approaches developed for the Environmental management are

- 1) Adhoc approach - developed in relation to specific situations
- 2) problem solving approach - identification of problems & needs + implement solutions
- 3) System approach
- 4) Specialist discipline approach
- 5) Voluntary sector approach (NGO)
- 6) Commercial approach
- 7) political ecology approach.
- 8) Human Ecology approach.

Apart from the above, an Environmental management System (EMS) approach has been developed as an integrated and proactive approach to environmental issues.

It helps industry (or) other bodies and is designed to ensure that an Environmental policy and Environmental objectives are adopted and followed. Below figure illustrates a basic EMS approach developed by Hurd and Johnson (1995).



Thus, EMS system approach helps to

- a) Develop a proactive Environment approach
- b) Ensure a balanced view across all functions
- c) Enable, Effective, directed Environment goal setting
- d) make the Environmental auditing process effective.

Nowadays, there has been an increasing emphasis on Environmental management for business as role of business has increased in environmental protection protection.

The emphasis is on

1. green corporate Environmental management
2. green business Ethics
3. Eco-auditing
4. Impact assessment, hazard and risk management
5. green marketing and labelling
6. Recycling and waste disposal
7. Environmentally sound investing investment and funding
8. Total quality management.

The commercial approach involves corporate priority, Employee education, customer advice, transfer of technology, prior assessment, facilities and operations, research and compliance and operating.

While doing any integrated any above mentioned integrated approach, the following aspects should be taken into account.

↳ ~~perception and awareness~~

↳ ~~source of perception and awareness~~

1. perception and awareness.

a) source of perception and awareness

b) Level of perception

c) Role of perception in Environmental planning.

2. Environmental Education and Training
- at schools, college and university level
and at research and training institutes
 - Advertisement through media

3. Resource management

- Classification of natural resources
- Survey and Evaluation of Eco-resources
- Conservation of Energy, mineral, forest, Soil and water resources and
- proper utilization of human resources

4. Environmental impact assessment:

- Assessment of present conditions
- Assessment of the impact of industrial and technological developments
- Assessment of the efforts done for Eco-balance
- Development of Eco-friendly techniques

5. Control over Environmental degradation and

Pollution :

- Purification of degraded Environment
- Pollution control
- Monitoring
- Forecasting of natural hazards and to minimize the losses.

i) Business charter for sustainable consumption and production ✓

The international chamber of commerce (ICC) is a non-governmental organization serving world business. Its membership extends to more than 130 countries and includes thousands of business organizations and enterprises with international interests.

ICC developed a "Business charter for Sustainable development" which sets out 16 principles for Environmental management. The charter covers Environmentally relevant aspects of health, safety and Product Stewardship. Its objective is "that the widest range of Enterprises commit themselves to improving their Environmental performance in accordance with the principles to achieve SDG [Sustainable development goals]

The 16 principles set out in the charter are as follows:

- * Corporate priority
- * Integrated management
- * process of Improvement
- * Employee Education
- * prior assessment
- * products and services
- * customers advice
- (*) Facilities and operations
- * Research
- (*) precautionary approach
- * Contracts and supplies
- * Emergency preparedness
- * Transfer of Technology
- * Contributing to the common effort.
- * openness to concern
- * Compliance and reporting.

a) Corporate priority

To recognise Environmental management as among the highest corporate priorities and as key determinant to sustainable development; to establish policies, programmes and practices for conducting operations in an environmentally sound manner.

b) Integrated management

To integrate these policies, programmes and practices fully into each business as an essential element of management in all its functions.

c) process of improvement

Continually improve corporate policies, programmes and environmental performance, taking into account technical developments, scientific understanding, consumer needs and community expectations, with legal regulations as a starting point and to apply the same environmental criteria internationally.

d) Employee Education

To educate, train and motivate employees to conduct their activities in an environmentally responsible manner.

e) prior assessment

To assess environmental impacts before starting a new activity (or) project and before decommissioning a facility (or) leaving a site.

f) facilities and operations

To develop, design and operate facilities and conduct activities taking into consideration the efficient use of energy and materials, the sustainable use of renewable resources, the minimization of adverse environmental impacts of waste generation and the safe and responsible disposal of residual wastes.

g) Research:

To conduct (a) Support research on the Environmental impact of raw materials, products, processes, Emissions and wastes associated with the enterprise and on the means of minimizing such adverse impact.

h) precautionary approach:

To modify the manufacture, marketing (a) use of products (or) services (or) the conduct of activities, consistent with scientific and technical understanding, to prevent serious and (or) irreversible environmental degradation.

i) Transfer of Technology:

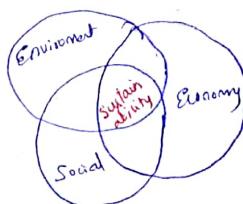
To contribute to the transfer of Environmentally Sound Technology and management methods throughout the industrial and public sectors.

j) Compliance and reporting:-

To measure Environmental performance; to conduct regular Environmental audits and assessment of compliance with company requirements, legal requirements and periodically to provide appropriate information to the board of directors, shareholders, employees, the authorities and public

Tools for sustainable Consumption and production:

For achieving sustainable development we need to balance following three pillars



Following are the some of the tools for sustainable management

- * Business perspective
- * Analytical Tools
- * Procedural tools
- * Communication Tools
- * Tool box

a) Business perspective / goals :-

Companies can act in two very different ways to society's demand for sustainable development

- i) Reactive: Fulfilling existing laws, directives and perhaps standards
- ii) proactive: Go beyond Existing regulations to become leader and use sustainability aspects as business opportunities.

b) Analytical Tools :-

* Following are the some of analytical tools

i) Environmental Audit check list

Qualitative tool that serve as a guide for the orientation of the Environmental Management of a company

ii) Life cycle assessment (LCA)

A Tool for the systematic Evaluation of the Environmental aspects of a product (or) service system through all stages of its life cycle.

iii) Industrial Accident Risk Evaluation.

* Determination of the Environmental Risk

due to the installation (or) the operation of industrial processes.

d) Material flow Accounting (MFA)

Refers to accounting in physical units (usually in tons); the life cycle of materials in a given location

e) Cost Effective Analysis ;

» consideration of abatement costs .

→ Comparison of this cost with abatement results that are obtained with a certain amount of money.

f) Cost benefit Analysis (CBA)

Economic assessment tool from social (or) societal

point of view in contrast to the company view.

c) procedural tools ↗

» Environmental impact Assessment

→ Environmental Management system

» Environmental Audit

» Eco-design

» Supply chain management - { streamlining everything from product flow to unexpected natural disasters }

d) Communication Tools ↗

→ Consumer communication and marketing

→ Eco-labelling

→ Multi-stakeholder dialogue

Barriers to adopt sustainability production and consumption

- Lack of resources
- Lack of awareness
- Lack of ~~Funding~~ Training and skills.

a) Lack of resources:

Many companies do not invest in sustainability practices due to the lack of resources. Resources ~~are~~ not big may not be big issue for big corporations, but for small & medium Enterprises lack of resources is the main issue i.e., they do not have enough finance to implement sustainable practices.

"Although Everyone are trying to adopt sustainable practices, but still ~~they~~ they are not practicing due to lack of resources & finance".

b) Lack of awareness

Lack of awareness has been identified as another main barrier for the adoption of sustainability practices. Besides this, if people are aware then they resist to change, this is also the barrier while implementing sustainable practices.

c) Lack of staff Training and skills

Most of the industries are facing the problem of staff training and lack of skills. most of industries have a old staff who do not have adequate skills that are necessary to use these sustainability practices. Level of knowledge and experience of

the managers and other staff is very important for adopting sustainability practices. Similarly, awareness to seek knowledge about change is also important.

Drivers to adopt sustainability practices

- Stakeholders pressure
- Competitive pressure
- Regulatory pressure
- Commitment by top management.

a) Stakeholders pressure

Sustainability is related in the context with responsibility and is defined by owner values. Most of the stakeholders have belief that the organization should adopt those policies and acts that will show norms and values of the organization. Many stakeholders ^{should} pressure their enterprises to adopt sustainability practices because these practices care about environment & lives of people.

b) Competitors pressure

As most of companies ~~will~~ are giving keen importance to sustainable Environment protection they are adopting sustainable practices. They will make/procurize competitor company to adopt sustainable practices.

c) Regulatory pressure

Regulatory laws are implemented by Government regarding Environmental protection. It is mandatory for industries to follow those laws.

Environmental fitness is a compulsory factor the government demand from organizations. With the growing concepts of sustainability practices the regulations by government are also increased. Some organizations are adopting because the sustainability practices because they feel it necessary to save the environment, other organizations are adopting because of regulatory pressure by the government.

d) commitment by the top management ✓

Management has key role in the adoption of sustainability practices. Many organizations have strategies on the implementation of sustainability practices, but few are implementing, because their management is not serious in practicing. So if the top management is committed, it can drive organizations to adopt such practices.

Environmental Stewardship ↴

* Stewardship of Environment refers to protecting the environment through recycling, conservation, regeneration, and restoration.

- * It means taking responsibility for our choices
- * The responsibility for environmental quality should be shared by all those whose actions affect the environment

(P.T.O)

* Environmental stewardship embodies the concept of Green office, a green school or green home which is conceptualised as smarter and better as at γ

- a) Ecological - using non-toxic, recycled, Environmental friendly products and supplies
- b) Efficient - using as little energy and other resources as possible and putting out the smallest amount of waste as possible
- c) Healthy - will generate as little visual, noise and physical pollution as possible.

Significance of environmental stewardship

Earth and most of natural species is environment already damaged greatly by human activity. Hence Environmental stewardship is important because we must preserve our Environment for our future generations.

Our Earth is being destroyed by our wasteful ways and we must correct ourselves before Earth's resources are completely depleted. With stewardship we will be able to work together one small step at a time to protect our Environment.

Environmental stewardship can help preserve natural resources and achieve sustainable outcomes. It mainly focused on fit natural resources systems and desired outcomes for each on

Alo: Sustain clean and healthy air

Ecosystems: protect and restore Ecosystem functions, goods and services

Energy : Generate clean energy & use it efficiently

Land : Support Ecologically Sensitive Land management and development.

Materials: use materials carefully and shift to environmentally preferable materials.

water: Sustain water resources to ensure quality and availability for desired uses.

Focus on priority environmental problems where stewardship has the greatest potential

a) Design stewardship strategies for small set of cross-cutting priority issues



- i) Sustainable products
- ii) Clean Transportation
- iii) Ecosystem protection
- iv) Community stewardship
- v) Resource conservation

b) Strategic use of challenge programs [Ex: reducing use of toxics, accelerating testing of priority chemicals]

c) Leverage market opportunity

Harness the increasing interest in Environmental Performance information by investment, insurance and other financial institutions to focus attention on priority risks.

- ↳ what motivates stewardship behaviours?
- * Information and Scientific Evidence about the status of natural resources
- * Increasing awareness of the risks and opportunities associated with business Supply chain
- * Growing public interest in Environmentally responsible Purchasing & investing

What hinders people and organization from adopting stewardship behaviours?

- * The perceptions that small actions do not really make a difference
- * Difficulty in making green products competitive in marketplace
- * Lack of attention to Environmental Performance by investment and financial institutions
- * Difficulty in measuring stewardship behaviour & performance

What steps could be Taken to promote Environmental Stewardship

- * Improve co-ordination of partnership programs and adopt more ~~more~~ customer oriented features
- * Increase technical assistance for small and medium sized business

- * conduct marketing research to better understand the attitudes that mainly influence people's behaviour of choice
- * work with Education Community to take stewardship principles part of minimum state Educational Standard

Environmental management principles

- * A multidisciplinary, interdisciplinary (or) holistic approach
- * a goal of sustainable development
- * It concerns for units, hazards and potentials
- * It supports for "polluter-pays" principle.
- * An attempt to act beyond the local (or) project level
- * Support for long term not just short-Term planning
- * Adherence to the "precautionary principle".
- * Integration of Environmental science, planning and management, policy making and public involvement
- * An awareness of the need to change the Ethics of peoples, business and government.
- * Employee Education
- * prior assessment of Environmental impacts.
- * A precautionary approach to Environmental problems.

National policies on Environment, abatement of pollution and conservation of resources :-

The policy elements seek to shift emphasis from defining defining objective for each problem area to ward actual implementation but the focus is on the long term.

The major major problems are pollution of water by traditional organic waste, waste generated from industrial waste etc., pollution of air in major cities, depletion of forests etc.,

The National policy thus on Abatement of pollution, mainly concentrates mainly on above problems. The Government seeks to ensure that its policies in every sector are based on a set of principles that harmonize Economic development and Environmental imperatives.

objectives of national policy

The objective is to integrate Environmental Considerations into decision making at all levels. To achieve this steps have taken to

- * prevent pollution at source
- * Encourage, develop and apply the best available practicable technical solutions
- * Ensure that polluter pays for the pollution and control arrangements
- * Focus protection on heavily polluted areas, and river stretches and
- * involve the public in decision making.

Some National policies on Environment, abatement of pollution and conservation of resources are.

a) Standards for Concentration of pollution

The present standards are based on the concentration of pollutants in Effluents and emissions. The norms will be revised to lay down mass-based standards, with which will set Specific limits to & Encourage the minimization of waste, promote recycling and reuse of materials as well as conservation of natural resources, particularly water.

Standards will not merely be a regulatory tool but will be mechanism to promote technological upgradation to prevent pollution, conserve resources and regulate waste. Regulations for liability and compensation for damages will supplement standards, to promote greater care and caution towards pollution prevention.

b) Fiscal measures

The aim of this is to give industry and consumer clear signals about the cost of using environmental and material resources. At present there are several fiscal initiatives for installation of pollution control equipment and for shifting polluting industries from congested areas. Economic instruments will be investigated to encourage the shift from curative to preventive measures, internalize the cost of pollution and conserve resources. The economic instrument majorly depends on characteristics and amount of discharge, hence it will stimulate the advancement of abated technologies and create increased demand of products.

c) Assistance for adoption of clean Technologies by small scale industries

Small scale industries are special feature of economy. Government are implementing a scheme for providing assistance for promoting combined facilities for treatment of effluents and solid wastes generated in clusters of small scale units. These scheme will be extended to provide necessary technical support as well.

d) Critically polluted areas

► mechanisms will be evolved to reduce local concentration of pollutants in complex industrial sites. This will include matching waste generators with waste buyers with the objective of solving waste disposal. Setting up of industrial estates and cluster of small industrial units in rural areas, will include pollution abatement measures as an essential component of infrastructure.

e) Environmental Audit

Industrial concerns and local bodies should feel that they ~~also~~ have a responsibility for abatement of pollution. For Environmental Audit is necessary.

The annual statement / audit will help in identifying and focusing attention on areas of concern, practices that need to be changed and plans to deal with the adverse effects.

The procedure of Environmental Audit ~~will be~~ ^{are} introduced in local bodies, statutory authorities and public limited companies to evaluate effect of policy, compliance of standards etc.

f) Environmental statistics

Authoritative statistical data on the environment is vital for development decision making. The collection and integration of environmental, economic and health data will be done to determine the status and to develop a concrete set of environmental indicators for monitoring the effects of pollution, information and access to the

public are essential so that Everyone knows what is happening to the Environment.

g) Public partnership

The public must be made aware in order to be able to make informed choices.

A government high priority ~~is~~ is to educate citizens about Environmental risks, the Economic and health dangers of resource degradation and real cost of Natural resources. Information about the Environment will be published periodically.

This information will help ~~to~~ motivate in

• affected citizens and non governmental organisations (NGOs) play role in Environmental monitoring and therefore allowing them regulate pollution

• Householders, as consumers make large number of relatively small individual contributions whose cumulative effect is considerable

• Consumer aware of Environmental harming products that will encourage manufacturers of manufacturers to produce goods that are Environmentally friendly and also in encouraging recycling and adopting adequate waste management.

h) Integration

Critical policy areas for control of pollution come under different departments and levels of government.

Steps will have to be taken to strengthen governmental and institutional structures dealing with Environmental management.

The Annual administration reports of the ministers will include a chapter on the action taken to follow

up the policy statement and other environmental initiatives they have taken or proposed.

Charter on Corporate Responsibility for Environmental Protection :-

Ministry of Environment & Forest (MoEF) has launched the charter on "Corporate Responsibility for Environmental Protection" in March 2002 with the purpose to go beyond the compliance of regulatory norms for prevention & control of pollution through various measures including waste minimization, in-plant process control & adoption of clean technologies.

The charter has set targets concerning conservation of water, Energy, recovery of chemicals, reduction in pollution, etc. Elimination of toxic pollutants, process and management of residues that are required to be disposed off in an environmentally sound manner. The charter enlists the action points for pollution control for various categories of highly polluting industries. The Task force was constituted for monitoring the progress of implementation of CREP recommendations / action points.

The charter was derived from an exercise undertaken by the Central Pollution Control Board (CPCB), which enlisted the action points for various categories of highly polluting industries. For monitoring implementation of charter, eight Task forces comprising representatives of the Ministry of Environment & Forests, Central Pollution Control boards, Industry associations and Experts have been constituted.

The key issues discussed were,

- * Handling and utilization of fly ash in thermal power plants.
- * Change over to membrane cell technology in chlor-alkali industries.

- * Effective use of post biomethanated distillery effluent for irrigation
- * incineration of toxic effluents resulting in the production of dye intermediates, pesticides, pharmaceuticals, petrochemicals
- * production of low sulphur fuels by refineries.
- * proper collection and treatment of effluents from tanneries,
- * Action to achieve zero effluent discharge in pulp and paper industries.

To discuss the status and to decide on further course of action, the Honorable minister of Environment and Forest called for a review meeting, which was attended by the Task force members, senior officials of the ministry, pollution control boards and industry representatives.

The findings of monitoring by the Task force indicate that important initiatives have been taken by various industries

- * Ensure that for aluminium industry only pre-baked technology (clean technology) be allowed for new projects
- * Existing pre-baked technology for aluminium production, the emission of fluoride reduced from 1.0 kg/tonne
- * Monitoring of the non-compliant cement industry, thermal power plants and iron and steel plants and asked CPCB to take bank guarantee (BG) with action plan from non-compliant industries.
- * Ensured that new thermal power plants will meet 100 mg/nm³ particulate matter standard and adopt dry fly ash extraction (at medium (35-40%) ash concentration pluming dipper system.

- * New guidelines for flue height have been developed considering ventilation coefficient
- * policy for use of beneficiated coal as per CREP rec. recommendation has been finalized.
- * Ensured that all steel plants using blast furnace sludge/oily sludge/ESP sludge in blast furnace.
- * Reduction of SO₂ Emission from refineries located in critically polluted / sensitive areas.
- * All new urea plants will have urea prilling towers based on natural draft
- * All fertilizer units will meet Total fluoride Emission limit of 25 mg/m³
- * Development of common LDAR protocol in progress for Petrochemical and refinery sector
- * In most of the cases, field visits have been made for on-site verification of the compliance of the implementation of CREP recommendations.
- * The state pollution control boards have also been asked to monitor implementation of the charter in respect of industries in their states