



# ENVIRONMENTAL PROTECTION AND MANAGEMENT (18CV753)

## **Course objectives:**

This course will enable students to gain knowledge in Environmental Protection and Management systems

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# ENVIRONMENTAL PROTECTION AND MANAGEMENT (18CV753)

## **Module -1 : Environmental Management Standards**

- Unique Characteristics of Environmental Problems –
- Systems approach to Corporate environmental management –
- Classification of Environmental Impact Reduction Efforts
- Business Charter for Sustainable Production and Consumption –  
Tools, Business strategy drivers and Barriers
- Evolution of Environmental Stewardship.
- Environmental Management Principles
- National policies on environment, abatement of pollution and  
conservation of resources
- Charter on Corporate responsibility for Environmental protection.

# ENVIRONMENTAL PROTECTION AND MANAGEMENT (18CV753)

## **Module -2 : Environmental Management Objectives**

- Environmental quality objectives
- Rationale of Environmental standards: Concentration and Mass standards, Effluent and stream standards, Emission and ambient standards
- Minimum national standards, environmental performance evaluation: Indicators, benchmarking
- Pollution control vs Pollution Prevention - Opportunities and Barriers
- Cleaner production and Clean technology
- Closing the loops, zero discharge technologies

## Environmental Management System

- **ISO 14000 - EMS as per ISO 14001**
- **Benefits and Barriers of EMS**
- **Concept of Continual Improvement and Pollution Prevention**
- **Environmental Policy**
- **Initial Environmental Review**
- **Environmental Aspect and Impact Analysis**
- **Legal and other requirements**
- **Objectives and Targets**
- **Environmental Management Programs**
- **Structure and Responsibility**
- **Training Awareness and Competence**
- **Communication**
- **Documentation and Document Control**
- **Operational Control**
- **Monitoring and Measurement**
- **Management Review**
- **EMAS**

# Module -4 Environmental Audit

- Environmental management system audits as per ISO 19011
- Roles and qualifications of auditors
- Environmental performance indicators and their evaluation
- Nonconformance – Corrective and preventive actions
- Compliance audits
- Waste audits and waste minimization planning
- Environmental statement (form V)
- Due diligence audit



# Module -5: Applications

Applications of EMS , Waste Audits and Pollution Prevention opportunities in

- Textile industry,
- Sugar, Pulp & Paper industry,
- Electroplating,
- Tanning industry,
- Dairy industry,
- Cement industry,
- Chemical industries, etc.

Trans boundary movement, disposal, procedures, of hazardous wastes.



## **Course outcomes:**

After studying this course, students will be able to:

1. Appreciate the elements of Corporate Environmental Management systems complying to international environmental management system standards
2. Lead pollution prevention assessment team and implement waste minimization options
3. Develop, Implement, maintain and Audit Environmental Management systems for Organizations



# Reference Books:

- 1.Christopher Sheldon and Mark Yoxon, “Installing Environmental management Systems – a step by step guide” Earthscan Publications Ltd, London, 1999.
- 2.ISO 14001/14004: Environmental management systems – Requirements and Guidelines – International Organisation for Standardization, 2004
- 3.ISO 19011: 2002, “Guidelines for quality and/or Environmental Management System auditing, Bureau of Indian Standards, New Delhi, 2002
- 4.Paul L Bishop „Pollution Prevention: Fundamentals and Practice“, McGraw- Hill International, Boston,2000.
- 5.Environmental Management Systems: An Implementation Guide for Small and Medium-Sized Organizations, Second Edition, NSF International, Ann Arbor, Michigan, January 2001.





# Environmental Impacts of Industrialization

There are four primary impact points when it comes to industrialization — **air, water, soil and habitat.**

- The biggest problem is air pollution, caused by the smoke and emissions generated by burning fossil fuels.
- The United State's EPA regulates more than 80 different toxins that can be found in industrial pollution, from asbestos and dioxin to lead and chromium.
- In spite of these regulations, industries are among the worst generators of air pollution in the world.



# Environmental Impacts of Industrialization

- Water pollution is also a problem in these areas, specifically in regions where factories are built next to natural water sources.
- These toxins can come in a variety of forms — solid, liquid or gaseous — and they can all end up contaminating the local water supplies.
- Even landfills and other waste disposal areas can leach toxins into the local water supply, leading to water pollution as in the case of rivers

# Environmental Impacts of Industrialization

## The Solution

- There are two possible approaches that both factories and legislators can take to help reduce the impact of industrial pollution.
- First, industries can reduce their reliance on a product that is causing pollution.
- The other option is to treat industrial waste to remove toxic components so that the rest of the waste can be disposed of safely.

# Environmental Impacts of Industrialization

## The Solution

- It isn't always easy, and it does require that each factory implements the proper procedures to purify or cleanse their waste byproducts.
- However, it can help reduce the soil, air and water pollution being produced by these facilities, and also help in conservation of natural resources.

# Unique Characteristics of Environmental Problems

Some of the environmental problems which are critical at the present time are fairly widely known because of the growing awareness of all levels of society, including governments, general public and the scientific community. However, our present information on the structure and function of the biosphere is not sufficient to allow an accurate evaluation of the total situation, except to indicate some broad problem areas. There may be serious potential problems of which we are as yet unaware; other known problems may be less serious than we think.

# Unique Characteristics of Environmental Problems

The consensus of the Commission's survey was that a fairly restricted number of problems were found to recur time and again. The major critical problem may be summarized as, "the adverse effects of a changed environment on human health and well-being"; i.e., the possibility that a changing environment may lead to increased mortality, increased frequency of diseases, lowered nutritional status via decreased agricultural productivity, or lowered psychological value of the environment. Concern has been widely expressed that these possible effects on man may be caused by direct input of toxic substances into the environment or improper land use. Climatic changes as a result of human activity may also adversely affect the standard of living through, for example reduced crop productivity, and increased energy consumption, etc.



# Unique Characteristics of Environmental Problems

Those problems considered most relevant for early implementation by a global environmental monitoring system are:

1. Potentially adverse climatic change resulting from human activities
2. Potentially adverse changes in biota and man from contamination by toxic substances including radionuclides
3. Potentially adverse changes in biological productivity caused by improper land use (reduced soil fertility, soil erosion, extension of arid zones etc.)

A second category includes problems that, although of great importance, are not suitable for early global monitoring either because of their nature or because further study is necessary to determine whether they should be included in a global environmental monitoring system. These problems are:

4. Potentially adverse changes in the growth, structure and distribution of the human population
5. Changes in the subjective human perception of the environment
6. Eutrophication of waters
7. Decreasing freshwater resources
8. Natural disasters

# Systems approach to Corporate Environmental management

- Corporate enterprises are some of the important vehicles of economic development in a country.
- There is a nexus between economic development issues and environmental management issues.
- Therefore, sustainable economic development should be environment-friendly.
- **It has to be emphasized that, in the long run, there is no conflict between environmental management and profitability of a firm**
- But, a company may be guided by short-term considerations where environmental issues, in the absence of legal compulsions, may be ignored.
- Companies must not forget that, with economic development, the environmental awareness has been on the increase.



# Systems approach to Corporate Environmental management

It may be pointed out that the ways in which corporations can take actions can be delineated into **four groups**:

- Environmental innovation
- Environmental strategy
- Environmental management, and
- Environmental technology



# Systems approach to Corporate Environmental management

## *Environmental innovation*

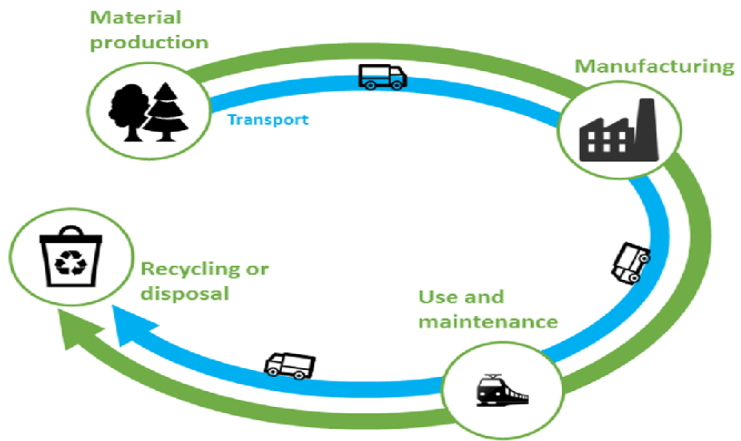
- Innovation refers to engaging in new economic activity and may comprise all stages of this process from initial invention through product development and introduction to the market.
- It can take place rapidly involving new technologies or techniques or it can take place slowly with small incremental steps to new technologies or techniques.



# Systems approach to Corporate Environmental management

## *Environmental strategy*

- A strategy is an integrated set of actions aimed at securing sustainable competitive advantage.
- A good management system must adopt suitable strategies.
- The ultimate objective of a firm is to achieve a long term sustainable advantage over its key competitors in all of its businesses
- As for example, 'cradle to grave' policies



# Systems approach to Corporate Environmental management

## *Environmental management*

- Environmental Management systems are designed to promote corporate objectives. They help planning, coordination, control and decision-making. They define authorities, fix up responsibilities and facilitate flow of information throughout the organization.
- A good environmental management is, therefore, a *driving force* for improvement of environmental performance.



# Systems approach to Corporate Environmental management

## *Environmental management*

- The objective of having a good environmental management is to help companies to make decisions and channel the available resources into those areas where benefits to the environment will be the greatest.
- The system identifies the ecological weaknesses of the firm and focuses management attention to problem areas. It covers the entire product range, product techniques and processes, marketing and post-consumption disposition of the product.

# Systems approach to Corporate Environmental management

## *Environmental technology*

- All technologies have some impacts on environment. Environmental technologies reduce unfavorable impacts on environment
- Environmental technologies may be of two types - 'end of pipe' or 'control' technologies and 'green' or 'clean' technologies.
- Control technologies are easy and less-expensive to incorporate into existing systems in order to comply with environmental regulations. Green technologies are 'general processes or products' which integrate environmental considerations into their design and/or application in order to reduce their impacts on the environment.



# Systems approach to Corporate Environmental management

## *Environmental technology*

- So, a company may adopt control technologies in the short run and in the long run it should gradually switch over to green technologies. The implementation of these short and long-term policies concerning environmental technologies cannot take place without an organizational structure that can effectively incorporate responses to environmental challenges.



- Review of progress
- Corrective action
- Seeking continuous improvement

**1. Sustainable Development Policy**

- Leadership and commitment to sustainability
- Identification of threats and opportunities
- Identification of stakeholders
- Identification of sustainability issues
- Policy definition and alignment with business strategy

**5. Review and corrective action**

**Business Strategy and Vision**

**2. Planning**

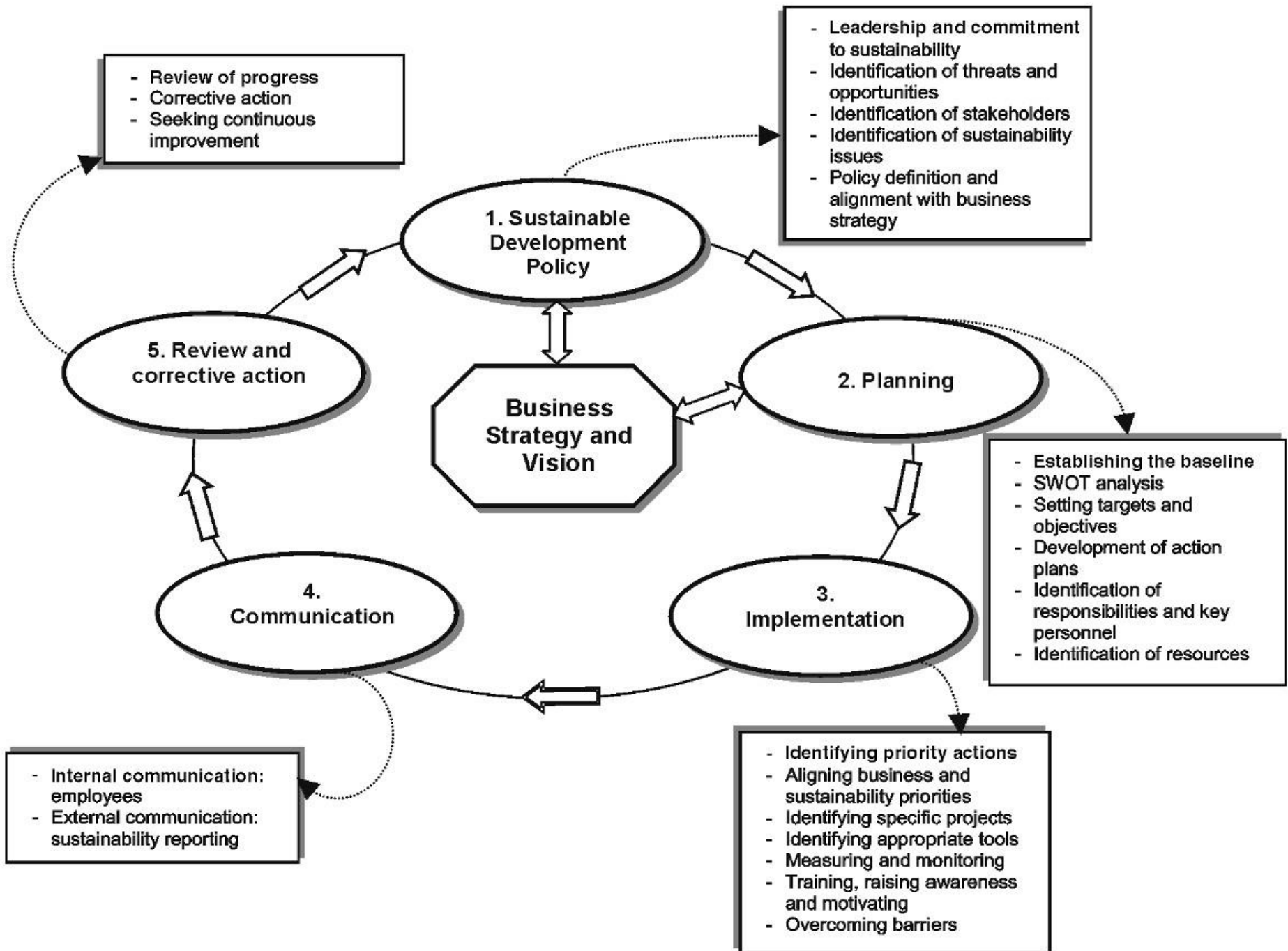
- Establishing the baseline
- SWOT analysis
- Setting targets and objectives
- Development of action plans
- Identification of responsibilities and key personnel
- Identification of resources

**4. Communication**

**3. Implementation**

- Internal communication: employees
- External communication: sustainability reporting

- Identifying priority actions
- Aligning business and sustainability priorities
- Identifying specific projects
- Identifying appropriate tools
- Measuring and monitoring
- Training, raising awareness and motivating
- Overcoming barriers





# Systems approach to Corporate Environmental management

## An Integrated Environmental Management Approach



# Evolution of Environmental Stewardship

**Environmental stewardship** refers to responsible use and protection of the natural **environment** through conservation and sustainable practices.

Aldo Leopold (1887–1949) championed **environmental stewardship** based on a land ethic "dealing with man's relation to land and to the animals and plants which grow upon it."





# Evolution of Environmental Stewardship

There are 3 types of environmental stewards: **doers, donors, and practitioners.**

- Doers go out and help the cause by taking action. For example, the doers in an oil spill would be the volunteers that go along the beach and help clean up the oil from the beaches.
- A donor is the person that financially helps the cause. They can do anything from donating their money, to hosting public events to raise funds. They are typically governmental agencies.
- Lastly there are practitioners. They work on a day-to-day basis to steer governmental agencies, scientists, stakeholder groups, or any other group toward a stewardship outcome.

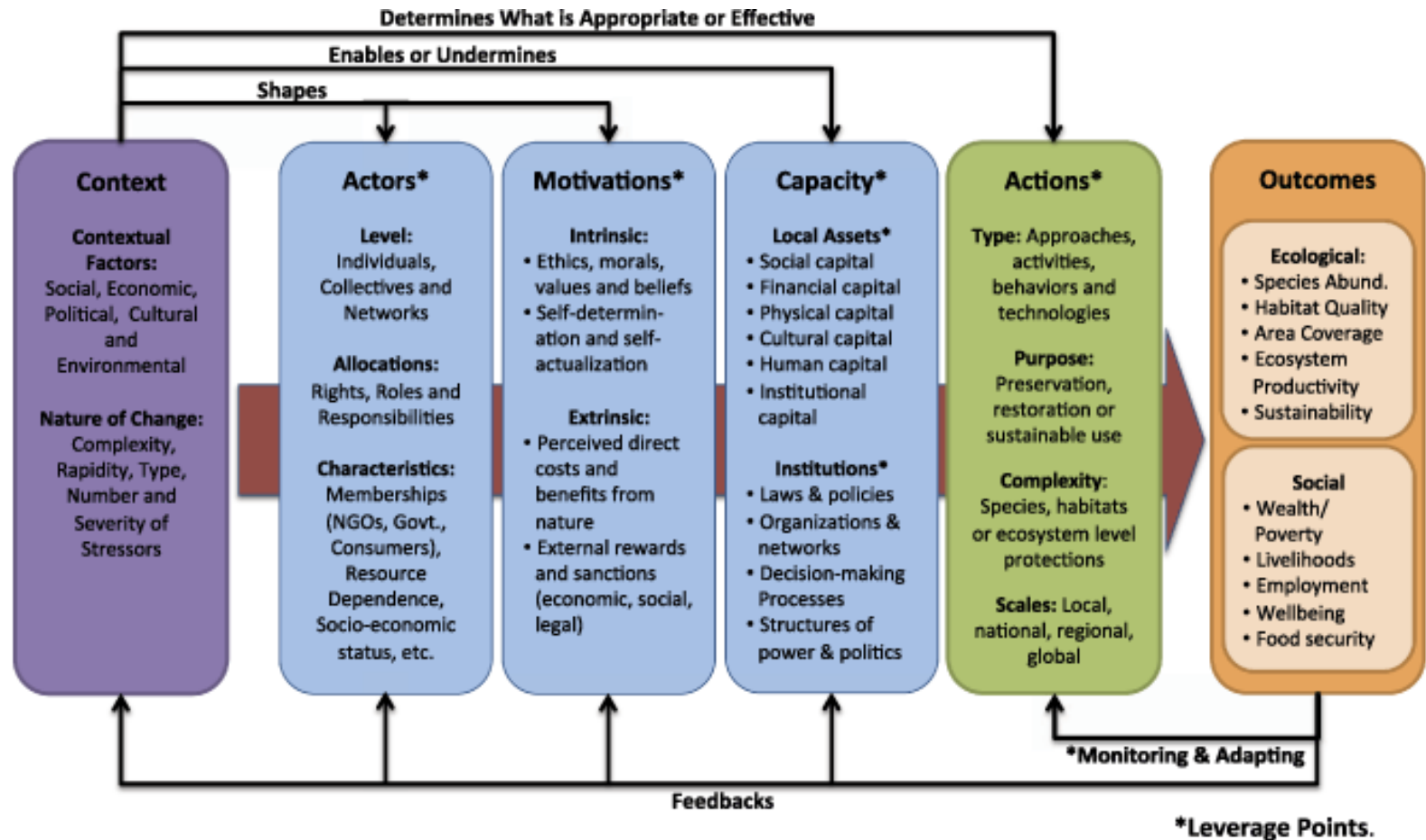


# Evolution of Environmental Stewardship

Anybody can be an environmental steward by being aware and knowledgeable of the world around them and making sure they do as little as possible to negatively impact our world. Without these groups it would be hard to get any sort of sustainability in our increasingly industrially based world.

**Environmental stewardship:** The responsible use and protection of the natural **environment** through conservation and sustainable practices to enhance ecosystem resilience and human well-being

# Evolution of Environmental Stewardship



# Evolution of Environmental Stewardship

Implementing Environmental Stewardship practices will result in many positive benefits for company. These can include:

- saving costs and adding value,
- potentially reducing company site's regulatory responsibilities,
- improving environmental performance and reducing liability, and
- providing company with a competitive advantage due to more effective and efficient operations.

Recognizable environmental stewardship activities include, but are not limited to, having a corporate environmental policy, mentoring to other businesses, implementing energy and water efficiencies, reducing the hazardous and other waste materials you generate, cutting down on the environmental impact of your staff's commuting activities, and many other sustainable actions



# Environmental Stewardship

## **Environmental Policy**

Write a policy (1-page document) that explains your company's environmental goals and policies.

## **Environmental Management System**

Sites can obtain ISO 140001 certification or develop and utilize their own EMS to annually (or more frequently) evaluate their environmental performance.



# Environmental Stewardship

## **Annual Environmental Report**

Yearly report posted to your company web page that explains your company's environmental performance for the past year.

## **Carbon Footprint**

Report that shows all greenhouse gas emissions. Must include both onsite and offsite contributions.

## **Environmental Purchasing Policy**

Establish an Environmental Purchasing Policy that requires the purchase of environmentally responsible products whenever possible





# Environmental Stewardship

## **Vendor/Supply Chain Requirements**

Establish vendor requirements/contracts with businesses that supply your company to ensure environmentally sound business practices are employed.

## **Mentoring Other Businesses**

Does the site offer mentoring of an environmental nature to other businesses? If yes, describe the mentoring program and any available contact information the site can provide



# Environmental Stewardship

## **Outreach Program**

Participate or offer assistance to community leaders and local groups to address, educate and collaborate on environmental issues in the community

## **Green Building Certification**

Obtain LEED building certification (or other recognized green building certification) for new or major building renovation projects.



# Environmental Stewardship

## **Green Building Implementation**

Utilize green building design concepts in new construction or renovation projects. No formal certification by LEED is required.

## **Life Cycle Assessments**

Conduct a detailed LCA of any products or site services/activities to evaluate environmental impacts, determine inefficiencies and institute improvements



# Environmental Stewardship

## **Hazardous Materials Reduction**

Reduce the amount of hazardous materials used at your facility or exchange your use of high hazard materials for less hazardous materials.

## **Water Use Reduction**

Implement changes at your facility that result in reduced water use. Examples: installation of water saving fixtures, grey water recycling systems, reuse of production waste water, rain water harvesting systems, etc.



# Environmental Stewardship

## **Material Conservation**

Conserve materials used at your site by changing process, product or formulations, participate in waste exchanges, reuse operational waste, etc. Materials required to be recycled by the State or your County do not qualify.

## **Employee Trip Reduction**

Provide a program to reduce or eliminate employee commuting trips to the workplace. Examples: telework program, flexible work schedules, incentives to carpool or use public transportation, etc



# Environmental Stewardship

## **Process/Operations Energy Use Reduction**

Reduce energy use associated with onsite processes or production operation. Examples: VFD motors on equipment, solar powered equipment or lights, etc.

## **Transportation Energy Use Reduction**

Reduce transportation energy use by upgrading company fleet to hybrid Vehicles or electric vehicles, switching to cleaner burning fuels, etc.



# Environmental Stewardship

## **Renewable Energy Use**

Major installations, such as solar panels or wind turbines, to generate renewable energy for onsite use; or you can purchase energy from a green energy power provider.

## **Environmental Enhancement Project**

Reclamation projects at your site or in the community, such as a wildlife habitat restoration, rain gardens, invasive species weed control, or use of native species.

# Environmental Stewardship

## Innovative Program

Any environmental activity not recognized under other stewardship categories, such as being a member of a state sponsored voluntary program

TOGETHER WE CAN CHANGE TOMORROW TODAY



## Environmental Stewardship

CONSEQUENCE HEALTH BIODEGRADABLE  
CLIMATE CHANGE RESPECT LEADERSHIP UPCYCLE  
WILDLIFE EDUCATION  
PRESERVATION CONSIDERATION UNDERSTANDING AIR QUALITY  
INVOLVEMENT BIODIVERSITY  
SUPPORT TECHNOLOGY  
RESPONSIBILITY RESPECT  
CONSERVATION RECYCLE POLICY  
INNOVATION PARTICIPATION IMPACT  
WATER USE PURPOSE  
ETHICS DIVERSITY OWNERSHIP  
SOLAR CONNECTION LIFE  
ENGAGEMENT POLLUTION HARMONY  
RENEWABLE EFFICIENCY



Together We Can Change Tomorrow Today

We are the first generation who truly understands that the world our children grow up in, will be vastly different from our own. How we overcome the challenges of our time, will make the difference between a world that we tolerate, and a world in which we prosper. One World is for everyone who feels they are living in a period of change, who feels uncertain about the future, and who wants to make the world a better place.

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# Environmental Management Principles

Environmental management refers to those activities which enhance beneficial links and minimise adverse links among resources systems and their environments, and which seek to attain desirable environmental system states, in response to community perceptions and desires, under prevailing socioeconomic and technological conditions

In particular, the goals of resources management are often single purpose, whereas those of environmental management are invariably multi-purpose' this is because resources management focuses only on its resource system while environmental management deals with both resource system and their environments. Further, community needs and value are fundamental to environmental management goal setting.

## **The Principles of Environmental Management:**

These are some guiding principles of environmental management. These principles are helpful in environmental decision making

### **1. Polluter Pays Principle (PPP):**

- For the last two decades, many economists have suggested that firms discharging polluting effluents to the environment should somehow be made to pay a price for such discharges related to the amount of environmental damage caused.
- OECD has suggested the Polluter Pays principles (PPP) as a general basis for the environmental policy. It states that if measures are adopted to reduce pollution, the costs should be borne by the polluters.

## 1. Polluter Pays Principle (PPP):

According to the OECD Council, “The principle to be used for allocating costs of pollution prevention and control measures to encourage rational use of scarce environmental resources and to avoid distortions in international trade and investment is the so-called Polluter Pays Principle.”

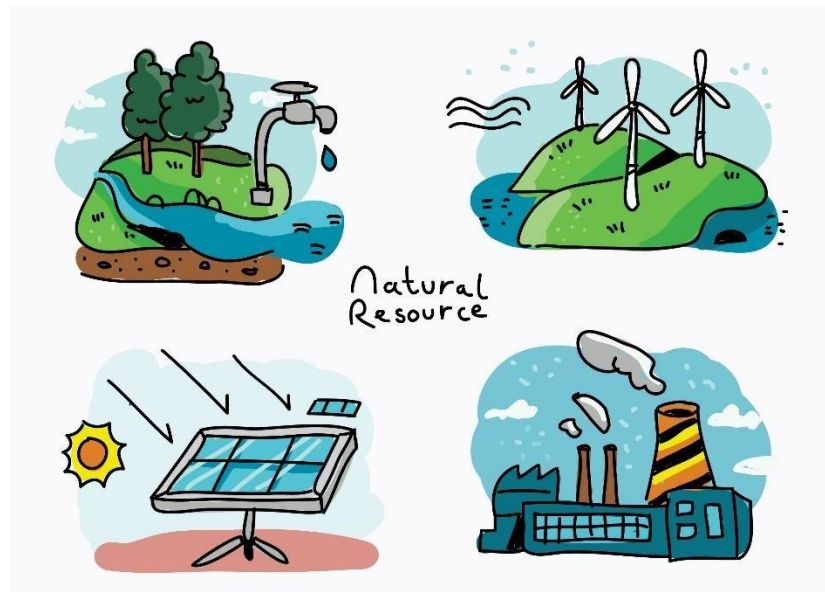
The essential concern of this principle is that polluters should bear the costs of abatement without subsidy.



## 2. The User Pays Principle (UPP):

It is considered as a part of the PPP. The principle states that **all resource users should pay for the full long-run marginal cost of the use of a resource and related services, including any associated treatment costs.**

It is applied when resources are being used and consumed.



## **3. The Precautionary Principle (PP):**

The main objective of the precautionary principle is to ensure that a substance or activity posing a threat to the environment is prevented from adversely affecting the environment, even if there is no conclusive scientific proof of linking that particular substance or activity to environmental damage. The words 'substance' and 'activity' are the result of human intervention.

Lack of full scientific certainty shall not be used as a reason for postponing cost effective measures to prevent environmental degradation. Therefore, the principle is essential for the protection of environment and human health by implementing in the field of production and distribution of energy resources

## **4. Principle of Effectiveness and Efficiency:**

It is essential that efficiency of resources use may also be accomplished by the use of policy instruments that create incentive to minimize wasteful use. It also applies to various issues of environmental governance by streamlining processes and procedures in order to minimize environmental costs.

## **5. The Principle of Responsibility:**

It is the responsibility of all persons, corporations and states to maintain the ecological processes. Further, access to environmental resources carries attendant responsibilities to use them in an ecological sustainable economically efficient and socially fair manner.

## **6. The Principle of Participation:**

- It is the duty of all the persons to participate in collectively environmental decision making activities.
- Some participation areas are related to the use of trees and other plants, minerals, soils, fish and wildlife for purposes such as materials and food as well as for consumptive and non-consumptive recreation.
- The second issue concerns solid waste i.e. garbage, construction and demolition materials and chemically hazardous waste etc.
- The third issue of participation is related to pollution generating activities.

## **7. The Principle of Proportionality:**

- The principle of proportionality is based on the concept of balance. A balance is to maintain between the economic development on the one hand and environmental protection on the other hand.
- It cannot be disputed that no development is possible without some adverse effects on ecology.
- Therefore, it is essential to adjust the interest of the people as well as the necessity to maintain the environment.
- Moreover, comparative hardships have to be balanced and benefits to a larger section of the people have to be maintained.



## National policies on environment

**The National Environment Policy (NEP) 2006** by the Ministry of Environment and Forests (MoEF) aims at mainstreaming environmental concerns into all developmental activities.

It emphasises conservation of resources, and points that the best way to aid conservation is to ensure that people dependent on resources obtain better livelihoods from conservation, than from degradation of the resources.

It argues that environmental degradation often leads to poverty and poor health outcomes among populations.

# National Environment Policy (NEP) 2006

The document goes on to highlight the principles underlying the policy that emphasise the:

- Important role of human beings in the sustainable development processes
- The non negotiability and incomparable value of environmental resources
- Right to development for all
- Equity in the use of environmental resources and
- The need for the decentralised and multisectoral approach in dealing with environmental issues.

# National Environment Policy (NEP) 2006

- The objectives of the policy include:
  - Conservation of critical environmental resources
  - Intra-generational equity
  - Livelihood security for the poor
  - Inter-generational equity
  - Integration of environmental concerns in economic and social development
  - Efficiency in environmental resource use
  - Environmental governance
  - Enhancement of resources for environmental conservation

# National Environment Policy (NEP) 2006

The document outlines a range of strategies to meet these objectives that aim at:

- Conservation of existing environmental resources through regulatory reforms
- Emphasis on education, information, research, capacity building and technological innovations
- Intersectoral collaboration and periodic evaluations of the existing policies.

# Environment Protection Act, 1986

The purpose of the Act is to implement the decisions of the United Nations Conference on the Human Environment. They relate to the protection and improvement of the human environment and the prevention of hazards to human beings, other living creatures, plants and property.

The Act is an “umbrella” legislation designed to provide a framework for central government coordination of the activities of various central and state authorities established under previous laws, such as the Water Act and the Air Act.

# Environment Protection Act, 1986

This act has four Chapters and 26 Sections.

**Chapter 1** consists of Preliminary information such as Short Title, Extend, Date of Commencement and Definitions. The definitions are given in the second section of the Act.

**Chapter 2** describes general powers of Central Government.

**Chapter 3** gives the Central Government the power to take action to protect the environment.

**Chapter 4** allows government to appoint officers to achieve these objectives. It also gives the government the power to give direction to closure, prohibition or regulation of industry pollution.

The act has provisions for penalties for contravention of the provisions of the act and rules, orders and directions. It also gives detail if the offence is done by a company or government department. It says for such offence the in-charge and head of department respectively would be liable for punishment.

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# Policy Statement for the Abatement of Pollution, 1992

The objective of this document is to integrate environmental considerations into decision-making at all levels.

To achieve this, the document lays down steps to be taken to prevent pollution at source, encourage, develop and apply the best available practicable technical solutions.

The Policy Statement for Abatement of Pollution, adopted in 1992 lays emphasis on pollution prevention in place of the conventional end-of-the-pipe treatment also identified the adoption of best available and practicable technologies as the key element for pollution prevention.

# Policy Statement for the Abatement of Pollution, 1992

The focus of the various programmes and schemes of the Ministry and its associated organizations related to pollution prevention and control is, therefore, on such issues such as promotion of clean and low waste technologies, waste minimization, reuse or recycling, improvement of water quality, environment audit, natural resource accounting, development of mass based standards, institutional and human resource development etc.

The whole issue of pollution prevention and control is dealt with by a combination of command and control methods as well as voluntary regulations, fiscal measures, promotion of awareness etc.



# National Conservation Strategy and Policy Statement on Environment and Development, 1992

- The National Conservation Strategy and the Policy Statement on Environment and Development are in response to the need for laying down the guidelines that will help to weave environmental considerations into the fabric of our national life and of our development process. It is an expression of India's commitment for reorienting policies and action in unison with the environmental perspective.
- It talks about the nature and dimensions of the environmental problems, actions taken in response to the problems and lists out priorities and strategies for action. It also views development policies from environmental perspectives and the support policies and systems required.

# Abatement of pollution

Abatement is a general term used for methods or technologies that reduce the amount of pollutant generated in a chemical or other manufacturing facility

In contrast, the terms cleanup and remediation refer to removal or appropriate disposal of the pollutants after they have been generated; these methods are also often referred to as end-of-the-pipe treatment. Current industrial practice places more emphasis on **abatement** (also known as **pollution prevention**) and follows the following simple rule:

**"If you don't make it, you don't treat it."**

# Abatement of pollution

Pollution abatement involves source reduction, in-process recycling, in-plant recycling, design modifications, off-site recycling, and treatment to make the waste less hazardous. Source reduction refers to the examination of various processing units in detail to determine if wastes can be minimized.

The step involves several layers of study:

- (1) Waste inventory is generated.
- (2) Critical processes leading to waste are identified.
- (3) Alternative processing strategies are studied to reduce the amount of waste generated in these processes.

The collection of waste inventory is an important part of such an analysis. In addition, the inputs that generate these wastes are identified. These data then suggest ideas for source reduction.

# Abatement of pollution

Pollution abatement refers to technology applied or measure taken to reduce pollution and/or its impacts on the environment.

The most commonly used technologies are scrubbers, noise mufflers, filters, incinerators, waste—water treatment facilities and composting of wastes.





# Abatement of pollution

## Air

- Smog, ground-level ozone pollution, acid rain and climate change influenced by greenhouse gas emissions are all products of fossil-fuel combustion, whether for industrial processes, electricity generation or gasoline-powered vehicles.
- Examples of contemporary **abatement strategies** include requiring smoke-stack scrubbers on coal-fired power plants to reduce emissions of sulfur and nitrogen dioxides and placing caps on carbon emissions to reduce greenhouse gases.

## Water

- Water pollution usually comes in one of two major forms, point source pollution and nonpoint source pollution. Point sources include specific release of pollutants into waterways, like industrial effluents or untreated sewage.
- Nonpoint sources are not locally specific and include pollution from storm water runoff in urban areas and pollutant leaching from contaminated soils.
- **Abatement measures** include requiring treatment of sewage waste water solids, installation of storm runoff retention systems (also called wet ponds) in areas with a high density of impervious surfaces and educating the public about the dangers of storm water pollutants to streams, rivers and aquifers.



## Soil

- Land pollution can come from a variety of sources. Landfills, chemical and fuel refinery leaks or spills and industrial agricultural techniques that require heavy use of pesticides and chemical fertilizers all contribute to soil pollution.
- **Abatement measures** include eliminating lead from fuels to reduce lead pollution of the soil, requiring underground liners for landfills, voluntary recycling programs, regulating fuel and chemical production to minimize risks of spills or leaks and exploring alternative agricultural methods to reduce the need for pesticides and herbicides.

## **Energy Conservation**

- Another basic but important pollution abatement strategy includes what many call reducing your carbon footprint. More people using fewer resources and less energy reduces pollution impacts on a larger scale.
- Examples of conservation include: using cleaner-burning fuels and renewable sources of energy like solar or wind power, using public transportation or carpooling, recycling and reusing paper, plastics and metals, insulating your home to make it more energy-efficient, installing energy-efficient appliances, and buying locally produced goods to reduce the need for shipping of products over long distances.

# Conservation of Resources

Natural resources are something which comes from nature and people cannot make natural resources, but they can collect it. Natural resources are the boon of nature to mankind.

Resources like wood, stones, lead, metals, air and many more are classified under natural resources. Natural resources are obtained directly from the Earth. Man-made objects use these resources for their benefit

The modern lifestyle and the advance in technology have had a very bad impact on natural resources. Natural resources like coal and petroleum are depleting at a very fast rate, and once they are depleted, we will have to depend on other sources of energy.

# Conservation of Resources

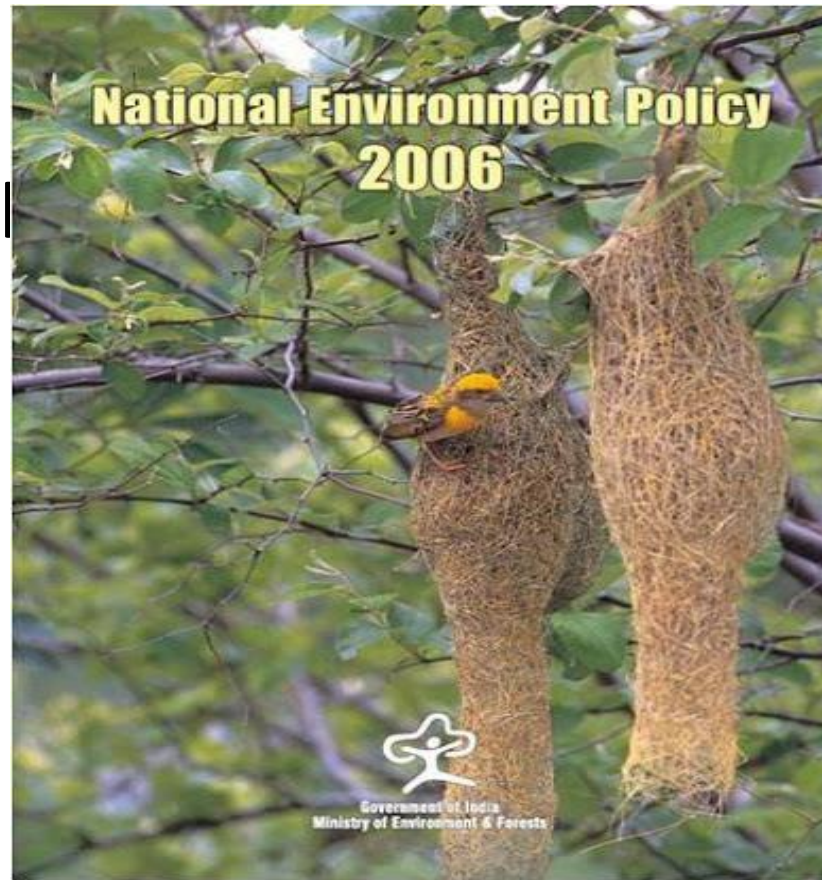
## Pollution

- **Environmental pollution** is one of the biggest problems that we are facing right now
- It refers to the contamination of the environment around us due to our activities.
- This environmental pollution covers all the aspects of pollution such as air pollution, land pollution, and water pollution



**The National Environment Policy (NEP) 2006** by the Ministry of Environment and Forests (MoEF) emphasizes conservation of resources

Con



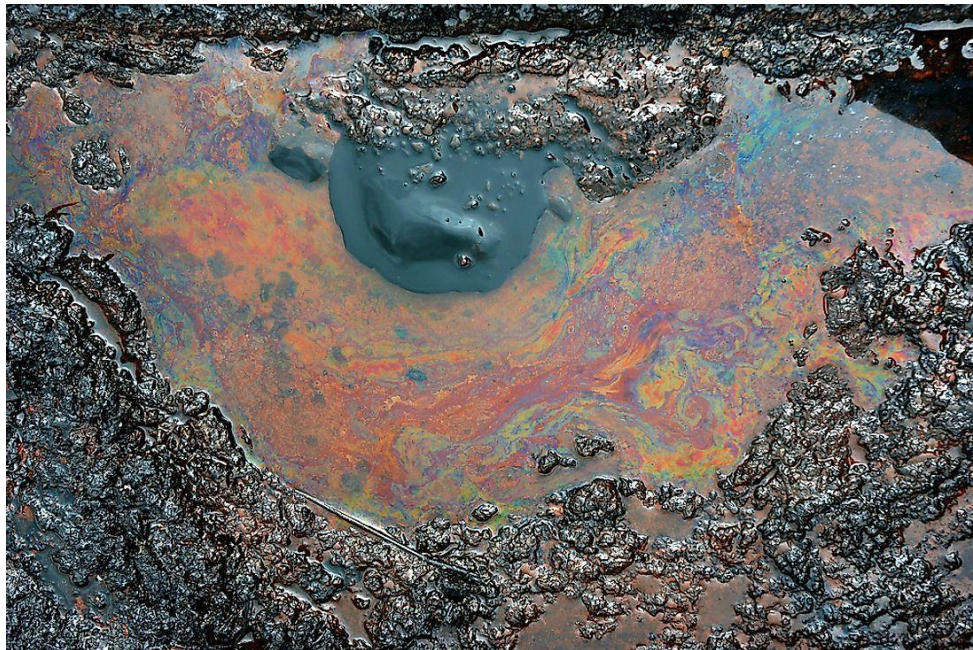
sources



# Conservation of Resources

## **Land Degradation:**

The degradation of land, through soil erosion, alkali-salinization, water logging, pollution, and reduction in organic matter content has several proximate and underlying causes such as disposal of industrial and domestic wastes on productive land.



# Conservation of Resources

**In addition, to such policy review, the following specific initiatives would be taken:**

- a) Encourage adoption of science-based, and traditional sustainable land use practices, through research and development, extension of knowledge, pilot scale demonstrations, and large scale dissemination, including farmer's training, and where necessary, access to institutional finance.
- b) Promote reclamation of wasteland and degraded forestland, through formulation and adoption of multistakeholder partnerships, involving the land owning agency, local communities, and investors.
- c) Prepare and implement thematic action plans incorporating watershed management strategies, for arresting and reversing desertification, and expanding green cover.
- d) Promote sustainable alternatives to shifting cultivation where it is no longer ecologically viable, ensuring that the culture and social organisation of the local people are not disrupted.
- e) Encourage agro-forestry, organic farming, environmentally sustainable cropping patterns, and adoption of efficient irrigation techniques.

# Conservation of Resources

## **Freshwater Resources:**

India's freshwater resources comprise the single most important class of natural endowments enabling its economy and its human settlement patterns. The freshwater resources comprise the river systems, groundwater, and wetlands.

They are also subject to significant net water withdrawals along their course, due to agricultural, industrial, and municipal use; as well as pollution from human and animal waste, agricultural run-offs, and industrial effluents



# Conservation of Resources

## **The following comprise elements of an action plan for river systems:**

- a) Promote research in glaciology to evaluate the impacts of climate change on glaciers and river flows.
- b) Promote integrated approaches to management of river basins by the concerned river authorities,
- c) Consider and mitigate the impacts on river and estuarine flora and fauna, and the resulting change in the resource base for livelihoods, of multipurpose river valley projects, power plants, and industries.
- d) Consider mandating the installation of water saving closets and taps in the building bye-laws of urban centres.
- e) Integrate conservation and wise use of wetlands into river basin management involving all relevant stakeholders, in particular local communities, to ensure maintenance of hydrological regimes and conservation of biodiversity.
- f) Incorporate a special component in afforestation programmes for afforestation on the banks and catchments of rivers and reservoirs to prevent soil erosion and improve green cover.

# Conservation of Resources

## **Groundwater**

Groundwater is present in underground aquifers in many parts of the country. Aquifers near the surface are subject to annual recharge from precipitation, but the rate of recharge is impacted by human interference.

The water table has been falling rapidly in many areas of the country in recent decades. This is largely due to withdrawal for agricultural, industrial, and urban use, in excess of annual recharge.

# Conservation of Resources

## **The following actions will be taken:**

- Promote efficient water use techniques, such as sprinkler or drip irrigation, among farmers. Provide necessary pricing, inputs, and extension support to feasible and remunerative alternative crops which may be raised by efficient water use.
- Support practices of rain water harvesting and artificial recharge and revival of traditional methods for enhancing groundwater recharge.
- Mandate water harvesting and artificial recharge in all new constructions in relevant urban areas
- Prepare and implement a comprehensive strategy for regulating use of ground water by large industrial and commercial establishments on the basis of a careful evaluation of aquifer capacity and annual recharge.
- Support R&D in cost effective techniques suitable for rural drinking water projects for remedial measures and removal of arsenic fluoride, and other toxic substances.
- Improve productivity per unit of water consumed in industrial processes, by making water assessments and water audits mandatory in identified industries and utilities.
- Suitable sites for dumping the toxic waste material may be identified and remedial measures may be taken to prevent the movement of the toxic waste in the ground water.

# Charter on Corporate responsibility for

## Environmental protection

- Industrial development is an important constituent in our pursuits for economic growth, employment generation and betterment in the quality of life.
- On the other hand, industrial activities, without proper precautionary measures for environmental protection are known to cause pollution and associated problems. Hence, it is necessary to comply with the regulatory norms for prevention and control of pollution.
- Alongside, it is also imperative to go beyond compliance through adoption of clean technologies and improvement in management practices.
- Commitment and voluntary initiatives of industry for responsible care of the environment will help in building a partnership for pollution control. This is the very purpose of this **Charter**.

# Charter on Corporate responsibility for

## Environmental protection

- The Government and the Industry broke new ground for pollution control in the form of a partnership initiative by releasing the Charter on Corporate Responsibility for Environmental Protection (**CREP**) on Thursday i.e. March 13, 2003.
- The Charter has set targets concerning conservation of water, energy, recovery of chemicals, reduction in pollution, elimination of toxic pollutants, process & 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.

# Charter on Corporate responsibility for

## Environmental

The Charter seeks to considerably reduce air and water pollution with the industry voluntarily agreeing to take up modernization of production processes and installation of necessary systems to reduce polluting effluents and other solid wastes.

This will be achieved through water and energy conservation, decreased use of raw materials, better monitoring of air and water quality, adoption of waste minimization options, better work practices and housekeeping etc.

The Charter also enables the industry to know the Government programmes, priorities and concerns in respect of **17 categories of major polluting industries** and gives appropriate time for implementation of action points identified in the sectoral discussions thus relieving the industry from the sudden burden and enforcement pressure

# Charter on Corporate responsibility for

Environment and Climate Change

## **17 CATEGORIES OF HIGHLY POLLUTING INDUSTRIES**

- 1. Aluminium Smelting**
- 2. Basic Drugs & Pharmaceuticals Manufacturing**
- 3. Chlor Alkali/ Caustic Soda**
- 4. Cement (200TPD and above)**
- 5. Copper Smelting**
- 6. Dyes and Dye Intermediate**
- 7. Fermentation (Distillery)**
- 8. Fertiliser**
- 9. Integrated Iron & Steel**
- 10. Leather Processing including Tanneries**
- 11. Oil Refinery**
- 12. Pesticide Formulation & Manufacturing**
- 13. Pulp & Paper (30 TPD and above)**
- 14. Petrochemical**
- 15. Sugar**
- 16. Thermal Power Plants**
- 17. Zinc Smelting**

# Charter on Corporate responsibility for

## Environmental protection

The greatest weakness is that compliance to norms are voluntary, not legally binding. Most of the norms are, in any case, way below global best practices. And since they were mutually agreed upon, there is no excuse for industry to not meet them.

When CREP was set up, it was presented as an alternate model to the traditional command and control regulatory mechanism.

The Charter marks a paradigm shift from regulatory enforcement of pollution control norms to voluntary compliance by the industry to significantly enhance the quality of environment. The Charter imparts the 'dimension of conscience' to the collective endeavour to fulfil the environmental objectives and targets