4.5 TREATMENT OF WASTE AND ENVIRONMENTAL POLLUTION

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Pollution is the discharge of chemical, physical, biological or radioactive contaminants to the environment. The principal forms of pollution include air pollution, water pollution, soil pollution, land pollution and waste pollution, to name a few. All these are considered as part of environmental pollutions. Today, the waste and environmental pollution is a severe ecological problem which not only affects the entire spectrum of our biota (man, animals and plants) but also the non-living natural resources of the earth. A variety of pollutants are continuously added in large amounts to our environment and this renders it highly toxic for our survival.

Waste pollution and waste treatment

Waste is defined as every substance or object arising from human or animal activities that has to be discarded as useless or unwanted. There are several forms of waste pollution such as solid waste pollution, radioactive waste, mining waste and hazardous waste. Several environmental problems persist due to the disposal of these forms of waste pollution. But now, the world has come a long way from dumping trash in holes to adopting hi-tech ways for waste pollution treatment. There are several ways of waste pollution treatment. It can be treated physically, chemically, and biologically.

Physical treatment

Physical treatment includes various methods of phase separation, sludge drying in beds and prolonged storage in tanks. All these processes depend on gravitational settlement.

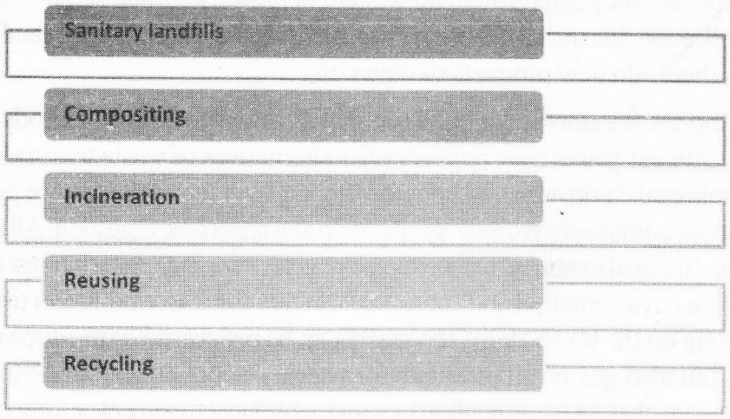
Chemical treatment

Chemical treatment is used both to facilitate the complete breakdown of hazardous waste into non-toxic gases, and more usually, to the chemical properties of the waste, for example, to reduce water solubility and to neutralize acidity or alkalinity.

Biological treatment

Various waste pollutions are treated by biological methods even though the concentration of toxic materials present in them is often lethal to micro-organisms.

Several other methods used for waste treatment are:



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Sanitary landfills

This is the most widely used waste disposal and management method. It involves disposing municipal solid waste by compacting it and then covering it with soil and blankets. Landfills should be well-engineered facilities that are strategically located, designed, operated, monitored, closed, cared for after closure and cleaned up when necessary. Waste disposed of in a landfill can be secured against the leaching of undesirable chemicals into ground water by solidifying them with materials such as cement and fly-ash from power plants. Without adequate precautions, the leachate ends up mixing with underground water and soil and might become a major source of dioxin pollution.

Compositing

This is the process of controlled decomposition of biodegradable organic wastes such as food and yard wastes into humus. It is a natural way of recycling organic waste into new soil. It can be replicated by us to use on a larger scale.

Incineration

This process is applied if the waste is biologically hazardous and it is resistant to biodegradation and persistent in the environment. It is applied to those wastes which cannot be recycled. The process of incineration is advisable if the waste is volatile and is easily dispersed, if it is not safe to dispose of the waste in the landfill as it contains organically bound halogens, lead, mercury, nitrogen, sulphur, etc.

Reusing

Reusing refers to using items by repairing, donating to charity or selling them. It means using a product more than once, either for the same or a different purpose as and when possible.

Recycling

This is the reprocessing of items. It aims at minimization of waste for final disposal and conservation of exhaustible natural resources. A lot of waste materials like

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broken appliances, metal containers, glass bottles, plastic, textile, tyres and newspaper are recycled through the system of rag-pickers and scrap-merchants. After collection, the useful materials are sorted, separated and sent to facilities that process them into new products or materials.

Besides the afore mentioned traditional waste treatment methods, several waste treatment plants have applied other alternatives of waste treatment which have a minimal environmental impact. Among such technologies are pyrolysis, gasification, combined pyrolysis–gasification and anaerobic digestion. All the afore mentioned thermal treatment technologies are generating increasing interest as visible alternative environmental and economic options for waste pollution treatment. Depending on the technology, the waste can be processed to produce not only energy, but also gas or oil products for use as petrochemical feed-stocks and carbonaceous char for use in applications such as effluent treatment or for gasification feed-stock. The production of storable end products such as a gas, oil or char, enables the possibility of de-coupling the end use of that product either for energy production or petrochemical use from the waste treatment process.

Environmental pollution

Contamination of land, water and air due to several man-made activities is termed as environmental pollution. This pollution has an adverse effect on environment. It may lead to global warming, climate change, depletion of the ozone layer, etc. Today, environmental pollution is the agenda of discussion in most of the developed and developing countries. It has been noted that there are various factors that are responsible for the occurrence of environmental pollution; these are overpopulation, industrialization and urbanization.

Due to the abovementioned reasons, basically three types of environmental pollutions persist in the environment. These are:

- Air pollution
- Water pollution
- Soil pollution

Pollution dealing with atmospheric changes is called air pollution. Contamination that pollutes water, irrespective of it being used for drinking or industrial purposes is called water pollution. Pollution caused to water after use is called waste water or effluents. The other type of pollution is soil pollution that is contamination of soil due to human activities such as deforestation, improper farming, excessive use of pesticides, herbicides, etc. Apart from air, water and soil pollution we have environmental pollution due to solid waste, hazardous waste, or biomedical waste which is rising in alarming proportion. In addition, we have specific pollution due to noise, pesticides, food, metal and thermal pollution which is also slowly but surely degrading the environment.

In order to fight such environmental pollutions several treatment plants and technologies have been developed and applied.

Treatment of air pollution

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Air pollution can be cured only by switching to fuels that are not very harmful for the environment. One can also cure the problem of industrial air pollution by organizing production processes.

Besides this, the polluted air can also be treated, for instance in air washing systems. Among biological methods, the treatment of air pollution can be done through biofilter and bioscrubber. Use of biofilter is the easiest and cheapest of air pollution treatment methods. In a biofilter, the components that are required include a bed of dung or manure, peat, 1 meter deep heather and tree bark. With the help of the entire components, a biofilter bed is prepared through which the contaminated air is blown.

Another method that can be applied in air pollution treatment is biowasher. Air is absorbed on water that streams along a package in a biowasher. Microrganisms are present over this package, which convert pollutants aerobically.

A traditional method of air pollution treatment is bioscrubber. This consists of two units—a scrubber and a biological treatment basin. In the scrubber, the soluble waste gases and oxygen are incessantly absorbed into water. In the basin unit the process of biological oxidation occurs.

Treatment of water pollution

Treatment of water pollution is a very difficult task, but still prevention and its treatment are both possible. There are various technical, educational, economic and legal methods through which water pollution can be treated. In terms of education, educating and making people aware about its pollution is the first step in its treatment.

In the terms of laws, formulation of several environmental laws can prevent water from being polluted. It has been found that water pollution discharged from one nation goes to another through rivers and seas. This way the water of the entire world gets polluted. Powerful enforcement of environmental laws across national and international boundaries may be a major source of water pollution treatment.

A nation rich with money can invest huge amounts on water pollution treatment technologies. Another economic way is to make polluting nations pay to clean up the pollution. This could deter people from polluting water.

Now let us look at some technological aspects of water pollution treatment. Treatment of water pollution can be achieved through the following four methods.

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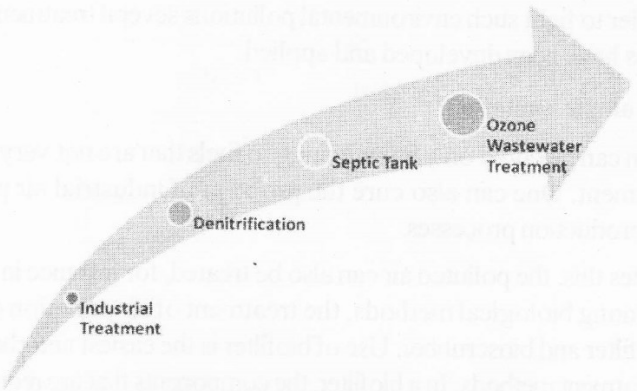

Industrial treatment

Most of the raw sewage before being released to the environment is treated properly in water treatment plant. In this process, the waste sewage passes through a number of chemical processes stored in different chambers, thereby removing the toxicity of the sewage by use of filters for removing a large number of suspended, solid particles and inorganic material.

Denitrification

In order to prevent groundwater pollution, the process of denitrification is used. The process of denitrification prevents the leaching of nitrates in soil.

Septic tank

Water pollution can also be treated through the use of septic tank. These are usually used to treat sewage in the cities. Here, untreated sewage flows into the septic tank. In this process, the liquids are separated from the solids. The heavier particles of the solid are settled at the bottom of the tank and the lighter parts settle at the topmost layer of the tank. As far as the liquids are concerned, they then flow out of the tank into a land drainage system and the remaining solids are filtered out. The rate of filtration may vary on the weight of the material of the land and water sources, but the premise of the septic tank is filtration.

Ozone wastewater treatment

This treatment is yet another popular treatment method of water pollution. Here, an ozone generator is used to break down pollutants in the water source. It is the role of the generator to convert oxygen into ozone. In this process, the ozone generator makes use of either the electric discharge field or the ultraviolet radiation. Through this method, most of the bacteria that are present in water are destroyed.

Treatment of soil pollution

The presence of harmful and toxic chemicals in the soil is termed as soil pollution. This will become a major problem in coming years. Therefore, to stop the adverse effects of soil pollution, various soil pollution treatment methods are being used. Some of the soil treatment methods are:

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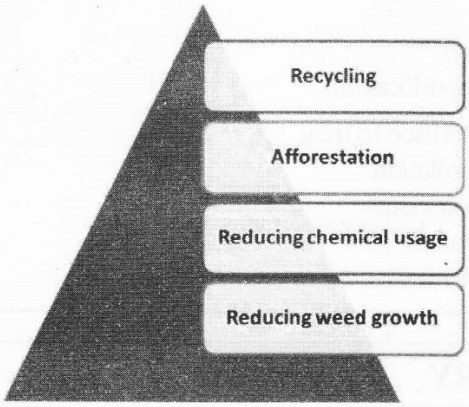

Recycling

One of the major causes of soil pollution is dumping waste materials in landfills. But recycling paper, plastics and other materials reduces the volume of refuse in landfills and thus save soil from being polluted.

Afforestation

Due to cutting down of trees, the soil loses its natural quality and can even erode. With afforestation, the pollution of soil can be reduced to a large extent.

Reducing chemical usage

Overuse of chemicals can lead to soil pollution. By reducing the use of chemical fertilizers and pesticides and herbicides, the pollution of soil can also be reduced.

Reducing weed growth

Reducing weed growth can lead to reduced soil pollution. In doing so, weed growth is covered with soil with numerous layers of wet newspapers or a plastic sheet for several weeks before cultivation. This prevents light from reaching the weeds, which kills them.

Check Your Progress

12. Any substance or object arising from human or animal activities that is to be discarded as useless or unwanted is termed as
    (a) Waste
    (b) Sewage
    (c) Soil pollution
    (d) Water pollution
13. Denitrification is used to prevent
    (a) Ocean pollution
    (b) Groundwater pollution

Contd. ...

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(c) Acid rain
(d) Tank impurification

14. Biowasher is used to treat
(a) Water pollution
(b) Land pollution
(c) Air pollution
(d) Soil pollution

4.6 SUMMARY

- In this unit, you have learned various strategies of environmental resource conservation including water, air, soil and forest resources. To start with, you have learned the meaning, objectives and strategies of afforestation.
- Afforestation is the direct human-induced conversion to forested land of land that is not covered by trees through planting, seeding or human-induced promotion of natural seed sources. This is a very important method of maintaining biological diversity.
- The key component of overall environmental resources planning is conservation of air, water and soil. In this unit, you learned the definition and meaning of air, water and soil conservation and the various strategies for their conservation.
- Waste and environmental pollution is a severe ecological problem which not only affects all living, but also the non-living natural resources of the earth.
- A variety of pollutants are continuously added in large amounts to the environment rendering it highly toxic for our survival. This unit dealt with some of the educational, legal and technical treatment of waste and environmental pollution.

4.7 KEY TERMS

- **Afforestation:** It is the direct human-induced conversion of unforested land that was not covered by trees through planting, seeding or any human-induced promotion of natural seed sources.
- **Crop rotation:** In this method, dissimilar crops are cultivated sequentially on the same piece of land which helps to the structure and fertility of the soil.
- **Contour ploughing:** It is a method in which cultivation is done on the contour lines of a slope to reduce the speed of water run-off and is an important strategy for soil conservation.

- **Denitrification:** A process used to prevent groundwater pollution.
- **Ozone wastewater treatment:** A process used to destroy bacteria present in water.

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4.8 ANSWERS TO 'CHECK YOUR PROGRESS'

1. (a) 2. (c) 3. (d) 4. (a) 5. (b), (d) 6. (a), (c) 7. (d)
8. (d) 9. (c) 10. (b) 11. (a) 12. (a) 13. (b) 14. (c)

4.9 QUESTIONS AND EXERCISES

Short-Answer Questions

1. What is afforestation?
2. Write a short note on environmental pollution.

Long-Answer Questions

1. Write a detailed note on afforestation strategies.
2. Write a detailed note on water pollution strategies.
3. Discuss the strategies for combating air pollution.
4. What are the strategies used for preventing soil pollution? Explain.
5. Write a note on environmental pollution and illustrate the various environmental pollution treatment methods.
6. Describe the underlying strategies for water conservation in the agricultural sector.
7. Explain how crop rotation and terrace cultivation helps to conserve soil.
8. Explain the biological method of air pollution treatment.

4.10 FURTHER READING/REFERENCES

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UNIT 5 ENVIRONMENTAL PROTECTION AND PROMOTION

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Structure

5.0 INTRODUCTION

One of the strategies to protect the environment and to promote environmental awareness among the masses is through laws, policies, legislation and movements. It has been found that with the passage of time, with the emergence and formulation of several laws and legislations and with movements by people, people are now more aware and concerned about the environment than ever before.

The focus of this unit is on the laws, policies, legislations and movements in the environmental sector. To start with, you will learn about the National Policy on Environment which has been developed in most of the countries. In India, the National Policy on Environment provides a comprehensive policy statement and infuses a common approach to the various sectoral and fiscal approaches to environmental management.

For protecting the environment, a number of laws have been passed worldwide. The mission of every law is to safeguard the natural environment, including air, water and land, upon which so much life depends. In this unit, special stress is given on Environmental Protection laws with special reference to India.

Increasing population, urbanization, industrialization and various developmental activities pose a threat to the environment. Therefore, for effective control and management of environmental pollution, suitable legislation is required, national level standards are to be evolved, pollution control technology is to be

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developed and pollution programmes are to be implemented effectively. In this unit you will learn about the Pollution Control Board of India and its role and functions in protecting and promoting the environment.

You will learn about certain environmental movements and the role of non-government organizations in the promotion of the environment and how these movements have contributed in ecological development so that our future is secure.

5.1 UNIT OBJECTIVES

After going through this unit, you will be able to:

- Describe the National Policy on Environment
- Understand the laws on environmental protection
- Discuss the role of pollution control boards, including the Central and State Pollution Control Boards
- Assess the role of environmental movements and non-governmental Organizations in the promotion of the environment

5.2 NATIONAL POLICY ON ENVIRONMENT

The environment comprises all entities, natural or manmade, which provide value to mankind. In order to manage the assets of environment, a national policy for environment has been developed in most nations across the world. In India, the National Policy on Environment offers a broad statement on environmental policy and also imparts a relevant suggestion on several fiscal and social aspects for the management of environment.

In India, the National Policy on Environment has a commitment to make the environment clean and green. It also makes a commitment on a positive contribution to global efforts. In every state, its citizen has the responsibility of maintaining a clean and healthy environment. Working together in partnership can easily impart a good and healthy environment to the citizens of the nation. In controlling the respective resource of the environment and in strengthening the environmental management in a state many stakeholders including local communities, public agencies, the investment communities and international development partners work together.

The key environmental challenges that the country faces relate to the nexus of environmental degradation with poverty in its many dimensions, and economic growth. These challenges are intrinsically connected with the state of environmental resources, such as land, water, air and their flora and fauna.

The National Environmental Policy is also planned in such a way that it alone makes an encouraging contribution to international efforts in eradicating environmental apprehensions in all development actions. The policy explains the important environmental challenges facing the country, normative principles underlying policy action, the intentions of environment policy and strategic premise for intervention. It also lays down the macro level indications done in institutional and legislative development steps, required to carry out the strategy level mechanism and themes for implementation and review. The policy has been prepared after due consultation and advice by different stakeholders and industry experts.

The National Environmental Policy is set up to review and enact the legislation by the Central, State and Local Government agencies. The Policy acts as a guide for various projects engaged in the execution of regulatory reforms and environment conservation reforms. The policy uses a large number of resources based outside the fiscal regime for fulfilling its objectives.

Present National Environmental Policy

The National Environmental Policy contains a set of national policies for environmental management. This set includes a large number of policies from the

- National Agriculture Policy, 2000
- National Water Policy, 2002
- National Population Policy, 2000
- National Forest Policy, 1998
- Policy Statement on Environment and Development, 1992
- National Conservation Strategy
- Policy Statement on Abatement of Pollution, 1992

All of these policies have recognized the need for sustainable development in their specific contexts and formulated necessary strategies to give effect to such recognition. The National Environment Policy uses its accumulated knowledge and the current experience to fill in the gaps that are present, by increasing its scope of coverage. In the process, it builds upon the earlier and existing policies instead of creating completely new ones. It is a response to our national commitment to a clean environment, mandated in the Constitution in Articles 48 A and 51 A(g), strengthened by judicial interpretation of Article 21.

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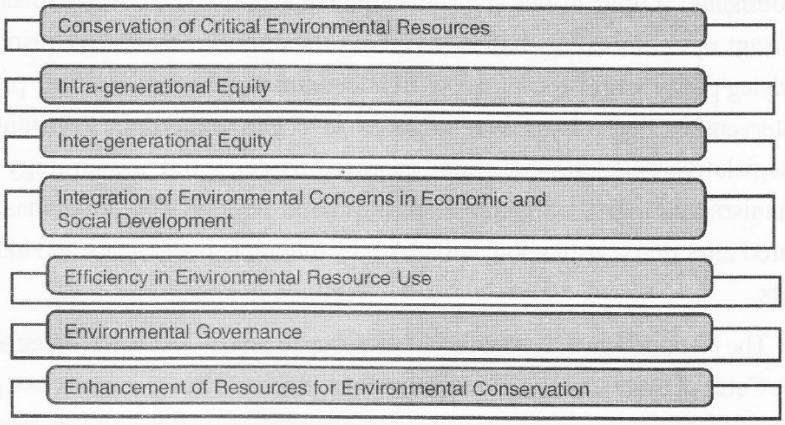
Objectives of the Policy

The principal objectives of the policy are listed below.



Conservation of critical environmental resources: The principal objective of the policy is to save environmental natural resources and man-made heritage which not only add economic benefit to the country but also act as a livelihood resource for human beings.

Intra-generational equity: The principal objective of the policy is to ensure equal benefit to the poor section of the society by providing them equitable access to environmental resources.

Inter-generational equity: The principal objective of the policy is to make sure that the environmental resources are used sensibly so as to provide for not only the current generation but also for the generations to come.

Integration of environmental concerns in economic and social development: The principal objective of the policy is to translate environmental concerns into projects, programmes, policies and plans for both social and economic development.

Efficiency in environmental resource use: The principal objective of the policy is to minimize negative environmental impact by decreasing resource usage in terms of usage per unit of economic output.

Environmental governance: The principal objective of the policy is to regulate and manage the use of environmental resources by using good governance principles such as regulatory independence, participation, reducing time and costs, implementing accountability, rationality and transparency.

Enhancement of resources for environmental conservation: For environmental conservation, the principal objective of the policy is to provide conventional comprehensions, adequate finance and social capital, management and technological skill. The availability of all these resources is possible through the collaboration of mutually beneficial multi-stakeholders and through the partnership between municipal agencies and local communities, through the

educational and research associations and through several bilateral and multilateral development partners.

Principles of the policy

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The development of the National Policy on Environment is based on the acknowledgement which states that only those developments are sustainable which admire the significance of justice and integrity and which also respect the environmental limitations. As discussed above, the main objectives of the National Policy on Environment are appreciated through planned intrusion provided by several public authorities at Central, local, and State levels of the government. The plans and strategies are based on the certain principles that mainly depend upon the economic, and administrative and technical aspects. The principles that guide the actions of different actors in connection to the policy are mentioned below.

Human beings are at the centre of sustainable development concerns: In harmony with nature, all human beings are allowed to lead a fruitful and healthy life.

The right to development: This must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations.

Environmental protection is an important constituent of the development process: In order to achieve sustainable development, environmental protection cannot be isolated from the developmental process.

The precautionary approach: If there is any reason or threat of degradation of environmental resources, insufficiency in scientific certainty is not a cause to delay the prevention and protection of environmental deprivation by applying commercial methods.

Economic efficiency: In a society, economic efficiency denotes maximization of welfare among all the members. The National Policy on Environment also endorses the globalization of environmental cost according to which the polluter will accept the cost of pollution. The policy lays due emphasis on minimizing the wastage of natural resources, leading to an increase in efficiency through the use of different policy statements. The various procedures and processes are streamlined to help execute the different issues of environmental governance. This helps in reduction of delays and wastage leading to different kinds of expenses.

Entities with incomparable values: Certain resources do not have any value or their value is incomparable. The society or the masses at large do not accept any compensation or monetary value for loss of such resources. Such resources can involve significant risk to life, human health or the environment.

Equity: According to the cardinal principle of equity or justice, the law cannot treat any human being differently based on insignificant or irrelevant differences among them. These equity laws are of different types:

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End-result equity: The equity laws relate to fair outcomes in terms of equal distribution of obligations and entitlements.

Procedural equity: The equity rules are applicable according to context.

Decentralization: The Decentralization of power involves transfer of power from the Central Authority to Local and State Authorities. These powers are applied to address certain salient issues and empower the public authorities that have jurisdiction at the spatial level.

Public trust doctrine: The State is not an absolute owner, but a trustee of all natural resources, which are by nature meant for public use and enjoyment, subject to reasonable conditions, necessary to protect the legitimate interest of a large number of people, or for matters of strategic national interest.

Integration: Integration is the accumulation of ecological consideration in the policymaking sector. The integration also leads to strengthening of different types of linkages whether it is at the State level, Central level or Local Self- Government levels. These linkages are charged with implementing the different policies related to the environment.

Environmental standard setting: All the standards that are adopted in our society these days can lead to huge social or economic costs if they are not used carefully and are rather applied discriminately. Therefore, before setting of these standards one must take into consideration a large number of factors such as compliance cost, technical feasibility of the project being undertaken, strategic considerations and other environmental issues.

Preventive action: The policy states that all individuals should try to prevent damage to the environment as their prime duty. This would be more beneficial than restoring the degraded environmental resources at a later stage.

Environmental offsetting: The policy lays down a set of general obligations required to protect the natural systems that help in sustaining life along with protecting a large number of endangered or threatened species. It also helps to provide livelihood to the masses and take care of their general well being. In case it is difficult to provide such protection (in cases that override public interest) the proponents of the activity undertake a large number of offsetting measures. The policy emphasizes the different strategy themes and actions that not only focus on recent initiatives, but also emphasizes the outgoing activities, roles and functions. It lays due importance to key development changes.

Regulatory reform: In order to manage the environmental and natural resource, a holistic approach is very essential. For this, regulatory reform is one of the best options. The environmental conservation regulatory reform mainly comprises a set of dictatorial institutions and a governmental framework through which environmental quality is maintained.

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Process-related reforms: Process-related reforms will be followed for reviewing the existing procedures for granting clearances and other approvals under various statutes and rules.

Substantive reforms: Need for substantive reforms to make the regulatory process more effective for:

(a) ***Environment and forest clearance:*** At the planning stage it is necessary that environmental apprehensions are addressed to encourage regulatory authorities. Projects should be implemented for prohibiting the conversion of dense forests regions into non forests regions.

(b) ***Developmental activities in coastal areas:*** There is a need to effectively ensure protection to coastal environmental resources, valuable in nature.

(c) ***Living modified organisms:*** It has been found that the Living Modified Organisms is a biggest threat to human and animal health and can disturb the ecological resource of the environment. Biotechnology has an immense potential to enhance people's livelihood and add additional benefit to the country's economy.

(d) ***Environmentally sensitive zones:*** On scientific basis and with efficient participation of the local bodies, for the environmentally sensitive zone, an area development plan must be implemented.

(e) ***Monitoring and enforcement:*** Monitoring infrastructure and trained employees in enforcement institution is very important for environmental compliance.

(f) ***Use of economic principles in environmental decision-making:*** In order to encourage more effective and proficient allocation of environmental resources, the use of economic principles in environmental decision-making is very important. In addition, for the proper regulation of environmental needs, use of economic instruments is also very essential.

Enhancing and conserving environmental resources: There should be enhancement and conservation of environmental resources in the area of land degradation, forest, wildlife, bio-diversity and traditional knowledge, natural heritage, fresh water resources, mountain ecosystem and coastal resources.

Pollution abatement: There should be consideration of different measures to reduce, control the air water and soil pollution.

Conservation of manmade heritage: There should be consideration of potential impacts on designated heritages sites while fixing ambient environmental standards for heritage sites of incomparable values.

Environmental standards, management systems, certification and indicators: Permanent machinery for revising emissions standards and strengthening of monitoring network, adoption of ISO-14000 in small-scale sector and preferential government programmes, etc., should be set up.

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Clean technologies and innovation: To promote clean technologies in environmental sector, it is essential to maintain, establish, and encourage capacity building in evaluating clean technology, establish a institution related to environmental research technology and apply economic resource in the enhancement of fiscal instruments for the promotion of clean technology.

Enhancing environmental awareness, education and information: For enhancing environmental awareness among the general mass in a society, it is essential to add environmental text and content in primary, secondary and tertiary level educational curriculum. Besides, it can also be added among the educational structure at professional levels. In addition to this, the strategies of environmental awareness should also have its online presence in public. This way, the citizen can alone eradicate the environmental pollution from the environment.

Partnership and stakeholder involvement: Strong emphasis on the following partnership has been emphasized—public community, public private, public-community-private and public-voluntary organization, public-private-voluntary organization, etc.

Check Your Progress

1. The National Forest Policy was introduced in the year
   (a) 1996
   (b) 1987
   (c) 1999
   (d) 1998
2. The National Environmental Policy is proposed to be a guide for projects on
   (a) Poverty alleviation
   (b) Educational
   (c) Environmental conservation
   (d) Regulatory reform
3. The objective of The National Environmental Policy includes
   (a) Eradication air pollution
   (b) Environmental governance
   (c) Educational development
   (d) Urbanization
4. Consideration of different measures to reduce and control air, water and soil pollution is referred to in
   (a) Pollution abatement
   (b) Climate change
   (c) Conservation of man-made heritage
   (d) Living modified organism

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5.3 LAWS ON ENVIRONMENTAL PROTECTION

Environment protection has since the mid 1970's assumed a progressively greater importance in the eye of public and government. It has been regarded as important as world peace and development. For protecting the environment, a number of laws have been developed worldwide. The mission of every law is to safeguard the natural environment including air, water, and land upon which most of the life depends on. To protect environment every country has separate laws, but few of the laws are induced by international bodies. Various international bodies have come together under various conventions with specific aims. The United Nations Framework Convention on Climate Change resulted from the United National Conference on Environment and Development held in Rio de Janeiro in 1992 with the aim of tackling the global environmental issue. The 1997, the Kyoto Protocol to the Convention developed out of the work of this Convention, but adoption at country level can often be slow.

This conference also led to the UN Convention on Biodiversity. It promotes the restoration of degraded ecosystems and the recovery of threatened species. It requires each contracting party to develop or adopt national strategies, plans or programs for the conservation and sustainable use of biological diversity.

There have been other Conventions on global scale relevant to atmospheric pollution. As part of the United Nations Environment Program, the Vienna Convention to protect the Ozone layer was signed in 1985, leading to the 1987 Montreal Protocol on substances that deplete the ozone layer.

The United Nations Economic Commission for Europe which covers all European countries, Russia, the United States and Canada has a Convention on Long Range Transboundary Air Pollution which has led to several protocols tackling different forms of pollution.

In India, environmental protection has been on agenda since 1960's yet it was only in 1980s that the seriousness of environmental degradation and the inadequacy of the existing laws to protect environment was realized. Since then a number of steps and laws have been initiated. However, in 1976, through the Constitution 42nd Amendment Act, environment protection as such was introduced into the Constitution in the following manner:

In Part IV relating to Directive Principles of State Policy, Article 48-A was added which is as follows:

'48-A Protection and improvement of environment and safeguarding of Forest and Wildlife—The State shall endeavour to protect and improve the environment and to safeguard the forest and wildlife of the country.'

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A new Part IV was added which introduced in the Constitution of India 'Fundamental Duties'. Article 15 A (g) of this part is as follows:

'15-A Fundamental Duties- It shall be the duty of every citizen of India- (g) to protect and improve the natural environment including forests, lakes, rivers, wildlife and to have compassion for the living creature.'

These two additions to the Constitution of India make it imperative for the State to do everything it can to protect and improve the environment which expressly includes here the safeguarding of the forest and the wildlife of the country.

Besides these Constitutional provisions which expressly provide for environmental protection, in the three lists of the 7th Schedule of the Constitution of India, the following entries exist which permit the Union of the State or both, to make laws having a bearing directly or indirectly, on environment.

LIST I: UNION LIST

Entry No.

6. Atomic Energy and mineral resources necessary for its production.
14. Entering and agreements with foreign countries and implementing of treaties, agreements and conventions with foreign countries.
24. Shipping and **navigation** on inland waterways.
25. Maritime shipping and navigation, including shipping and navigation on tribal waters.
29. Airways, regulation and organization of air traffic and of aerodromes.
52. Industries, the control of which by the Union is declared by Parliament by law to be expedient in the public interest.
53. Regulation and development of oil fields and mineral oil resources.
54. Regulation of mines and mineral development to the extent to which such regulation and development under the control of the Union is declared by Parliament by law to be expedient in the public interest.
56. Regulation and development of inter-State rivers and river valleys.
57. Fishing and fisheries beyond territorial water.

LIST II: STATE LIST

14. Agriculture, including agricultural education and research, protection against pests and prevention of plant disease.
15. Preservation, protection and improvement of stock and prevention of animal diseases.
17. Water, that is to say, water supplies, irrigation and canals, drainage and embankment, water storage and water power subject to the provisions of Entry 56 of List I.

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18. Land, that is to say, rights in or over land, land tenures including the relation of landlords and tenants and the collection of rents; transfer and alienation of agricultural land, land improvement and agricultural loans.
21. Fisheries.

LIST III: CONCURRENT LIST

17. Prevention of cruelty to animals.
    17 A. Forests.
    17 B. Protection of wild animals and birds
18. Adulteration of food stuffs and other goods
29. Prevention of the extension from one State to another of infecting diseases or pests affecting men, animals and plants.

Under these various powers given to the Union Parliament and the Legislatures to make laws under these Entries in the Constitution as well as the corresponding Entries under the Government of India Act, 1935, quite a number of laws have been framed by the Union and the State Legislatures.

Tewari Committee

It was in 1980 that the Government of India set up a committee under the Chairmanship of the Deputy Chairman of the Planning Commission Shri. N.D. Tewari to suggest the administrative and legislature measures that ought to be taken for the protection of the environment. The significance of the Tewari Committee Report lies as much in what it recommended by way of institutional arrangements to tackle environmental problems as in its analysis of the major environmental issues confronting the country.

The Committee laid great emphasis on the need for the proper management of the country's natural resources of land, forest and water in order to conserve the nation's ecological base and recommended that a land commission at central level should be established as an initial step to attain this objective. Tiwari Committee also recognized three different other sections of concern that are preservation of different spices of flora and fauna that are under threat since long back, extinction of fragile ecosystem, and to protect the environment from the pollution of water and air that is mainly generated through the deposition of waste products and through industrialization. In addition, the Committee also put its concern on the improvement of the human settlement conditions.

To achieve the above mentioned objectives or concerns the Tiwari Committee also laid great emphasis on the improvement of environmental education at school and college level. Also, it put great stress on enhancing the environmental awareness programmes among public at every corner of the street.

We cannot deny with the fact that there are various other environmental legislations present in our society that protects and preserve the environment. But

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they mainly focus on a particular portion of the environmental problems like air pollution or water pollution. As a result of this, many other areas of environmental hazards are left over. In fact, at several grounds there is insufficient knowledge of environmental protection among people and government. They have very little knowledge on matters concerning to environmental management, environmental protection, industrial protection etc. Therefore, to overcome with this problem, there is an essential need for the development of a separate law for environmental protection. Thus, to overcome the problem, in the year 1986 Environment Protection Act was established for environmental protection.

Environment Protection Act

The Environment Protection Act, 1986 is a milestone in the environmental protection law of India. It had not only become necessary but more so it reflected the awareness and concern of the people and the Government towards environment protection.

The statement of the objects and reasons for the enactment of the Act states that concern over the state of the environment has grown the world over since the sixties. The increasing pollution is the sign of loss of environmental quality including loss of green belt from the globe, concentration of toxic gases in the atmosphere, and devastating food chain, ecological imbalance etc. This has not only generated environmental threat but is also a threat to all life forms on the earth. Therefore, it was necessary to enact a law that would cover these loopholes.

Under the Environment Protection Act, 1986 the Central Government has the power to protect and improve the quality of environment by taking any necessary measures. It may appoint authority or authorities with such powers and functions as it deems fit to check environmental pollution. The Act laid down that no industry in a city or no person in the state through his processes and activities has the power to emit any poisonous effluents in the excess amount in environment. Further, they are not supposed to handle any dangerous substances without permission by the government. Even if they do so, they have to handle the substance in prescribed manner as mentioned by the government. The Act further provides for the setting up of environmental laboratories and punishment for contravenes of any of the provision of the Act.

Prior to this Act, India had various other laws related to environmental protection, some of which are:

Radiation

- The Atomic Energy Act, 1962

Air Pollution

- The Air (Prevention and Control of Pollution) Act, 1981
- The Insecticide Act, 1968

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- The Industries (Development and Regulation) Act, 1951
- The Factories Act, 1948
- The India Boiler Act, 1923
- The Poison Act,1919

Water Pollution

- The Water (Prevention and Control of Pollution) Cess Act, 1977
- The Water (Prevention and Control of Pollution) Act, 1974
- The Merchant Shipping (Amendment) Act, 1970.
- The River Board Act, 1956

Others

- The Forest Conservation Act, 1980
- The Urban Land (Ceilings and Regulation) Act, 1976
- The Wildlife Protection Act, 1972
- The Indian Forest Act, 1927
- The Ancient Monuments and Archeological Sites and Remains Act, 1958
- The Prevention of Food Adulteration Act, 1954
- The Indian Fisheries Act, 1897

Water and Air (Prevention and Control of Pollution) Act, 1974

Industrialization and urbanization in India had led to a serious problem of water and air pollution. It has been found that the rivers, lakes and streams of the country are facing tremendous problem water pollution. The adverse effect of this is seen on agricultural sector as well as on human and marine life. In addition, the pollution has also an adverse effect on the fiscal aspect of the country. It was therefore felt by the government of India that a precautionary measure is very much essential for the protection of air and water from being getting polluted from the discharge of industrial and domestic effluents.

The government of India decided to formulate a law, a law which will establish a well planned unitary agencies in every state of India in order to prevent and control water and air pollution in the environment. It was in the year 1974 that the Act called Water and Air (Prevention and Control of Pollution) Act, 1974 was passed. It was established at both central and state level. The act was mainly established for the control, prevention and abatement of air and water pollution from the environment.

Indian Forest Act

In India, law conserving the forest was passed in the year 1927 and was named as the Indian Forest Act. The Act was mainly formulated for the protection of forest

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and forest products. According to the Act, any forest or waste land can become a part of the government's property and may be considered as reserve forest by the government. According to the Act, the Government can announce the trees of the protected forest as reserved tree. It can also prohibit the combustion of lime or charcoal and mining of stone. Similarly, in order to maintain the ecological balance of the country's forest, the Forest Act, 1980 was established. The act stated that ecological imbalance as a result of deforestation is a social threat and need preventions. According to this Act the State Government with the approval of the Central Government can make:

(1) any forest land as reserved forest

(2) any forest land or any portion may be cleared of trees which have grown naturally in that land

(3) any forest land or any portion for non-forest purpose

(4) any forest land may be allocated to any private person on lease

Wildlife Protection Act

In order to protect the wildlife of the country, India has established another act called Wildlife Protection Act in the year 1972. According to this act limitations were made on the wildlife hunting. Also, only those people were supposed to be appointed for the protection of wildlife that has caliber. Under this act, it was the role of the State Government to declare any area to be a National Park or a Sanctuary

The environmental protection laws in India are many and very comprehensive. Penalties are provided in the acts, yet we find that environmental degradation is on the increase. It is not enough that we create a structure of legislations. We must also create a structure of administration in all the relevant departments which are concerned with land and soil, water and forest, and flora and fauna are affected and influenced very deeply by this concern for preservation of environment.

As a part of the environment, we should start thinking more seriously about our environment. Legislative enactments are no doubt necessary and needed to confine human from destroying nature but then laws alone do not bring about reforms. People have to be made aware of the basic fact that they have no business to destroy nature. What is needed is a strong movement that would help create and generate the required spirit to protect the environment.

Check Your Progress

5. The United Nations Framework Convention on Climate Change was held in the year
   (a) 1992
   (b) 1996
   (c) 1987
   (d) 1887
6. Under the Tewari Committee, great emphasis was laid on the
   (a) Management of economic resources
   (b) Management of natural resources
   (c) Management of educational resources
   (d) Management of social resources
7. Under the Environment Protection Act, 1986 the Central Government has the power to
   (a) Improve the quality of education
   (b) Improve the quality of science and technology
   (c) Improve the quality of environment
   (d) Improve the standard of living
8. The Environment Protection Act was introduced in the year
   (a) 1978
   (b) 1974
   (c) 1977
   (d) 1986

5.4 ROLE OF POLLUTION CONTROL BOARDS

India is a vast country with diversified activities. Increasing population, urbanization, industralisation and various developmental activities pose a threat to the environment. The very attempts of development, due to lack of integrated planning and ineffective implementation, lead to encountering of environmental problems from negligence of natural resources, inappropriate expansion of human settlement activities, discharge of hazardous waste and wastewater, mistreatment of poisonous chemicals, expansion and jumbled sittings of industries etc. A major source of environmental pollution is the industrial discharge (effluent/emission), domestic sewage and the automobile exhaust having a great potential to degrade the wholesomeness of water and the quality of air which are the basic requirements of all living systems on earth for survival.

Hence, in India, environmental management is a very important for nature protection. Here, the term environment management encompasses environmental protection and planning, environmental education and research, environmental

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monitoring and evaluation, and environmental conservation etc. All these are a major guiding factor for national development in India.

It is essential in maintaining and restoring the quality of soil, water and air are needed for their best designated use. For effective control and management of environmental pollution, pollution control legislation is required, national level standards are to be evolved, pollution control technology is to be developed and pollution control programmes are to be implemented effectively by suitable techniques.

Bodies for pollution control

To control pollution, Pollution Control Board has been established on national level consisting of two bodies the Central Pollution Control Board and State Pollution Control Board.

Central Pollution Control Board (CPCB)

The Central Pollution Control Board was established in the year 1974 as per the provisions of the Water (Prevention and Control of Pollution) Act, 1974. The key role of the Central Pollution Control Board is to control and decrease the pollution in the country. They do so by providing technical inputs for information of national policies and programmes, by generating appropriate data, by giving training and promoting awareness among manpower, and by providing scientific information to the general mass. The Board helps in the promotion of hygiene of water resources including streams and wells of various regions of the States. They perform the task of improving the quality of water and air in the country.

Other Key Roles of Central Pollution Control Board

- 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 nation-wide programme for the prevention, control or abatement of water and air pollution;
- Co-ordinate the activities of the State Board and resolve disputes among them;
- Provide technical assistance and guidance to the State Boards, carry out and sponsor investigation 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 programme on the prevention, control or abatement of water and air pollution;
- Organize through mass media, a comprehensive mass awareness programme on the 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;