Chapter-3

ENVIRONMENTAL POLICIES AND INSTITUTIONS: THE INDIAN SCENARIO

3.1 THE ENVIRONMENTAL POLICIES AND INSTITUTIONS IN INDIA

The present legal institutions for environmental management in India are the result of a spate of environmental laws enacted by the Indian Parliament in the aftermath of the UN Conference on the Human Environment in Stockholm in 1972. Addressing this Conference, the Prime Minister of India, Mrs. Indira Gandhi said, "The environmental problems of developing countries are not side effect of excessive industrialization but reflect the inadequacy of development. For the rich countries development is caused by the environmental destruction, but for developing countries it is one of the primary means of improving the environment for living, or providing food, water, sanitation and shelter, or making the desert green and the mountains habitable."

The policy makers believed that there is no trade-off between development and environment but in fact the relationship between them is complementary with the governmental effort for the preservation of environmental resources as an integral part of the overall strategy of economic development. It is this view which led to the emergence of supporting institutions for the environmentally sustainable economic development in India. But the history of some important statutes concerned directly or indirectly with environmental management in India can be traced as back as 1865. Some of them are worth mentioning as Bengal Smoke Nuisance Act of 1905; Bombay Smoke Nuisance Act of 1912; Wild Birds Animal Protection Act of 1912; Motor
Vehicles Act of 1938; Factories Act of 1948; River Boards Act of 1956; The Indian Forest Act of 1865; Elephant Preservation Act of 1879; Indian Easement Act of 1882 protecting the property rights of riparian owners against pollution by upstream users etc.

The Stockholm Conference in 1972 had led the Government of India to form the National Commission on Environmental Planning (NCEP) in the same year in the Department of Science and Technology which was regarded as an apex body of all environmental matters whose main responsibility was to plan and co-ordinate the activities of various ministries and agencies dealing with environmental matters. The following of the enactment of environmental laws consisting of Wildlife Protection Act, 1972 and Water (Prevention and Control of Pollution) Act, 1974 has been a landmark for the beginning of an era of governmental regulation for the control of environmental pollution in India. In continuation, the Government of India has undertaken a number of regulatory and promotional measures including the Water (Prevention and Control of Pollution) Cess Act, 1977; the Forest (Conservation) Act, 1980; the Air (Pollution and Control of Pollution) Act, 1981; the Environment (Protection) Act, 1986; Amendment of the Motor Vehicles Act of 1938 in 1988; the Public Liability Act, 1991 and a notification on Coastal Regulation Zone, 1991. Among the above mentioned legislations, the Water (Prevention and Control of Pollution) Act, 1974, amended in 1986; the Water (Prevention and Control of Pollution) Cess Act, 1977 amended in 1988; the Air (Prevention and Control of Pollution) Act 1981, amended in 1988; the Environmental Protection Act, 1986; the Forest (Conservation) Act, 1980, amended in 1988 and the Wildlife (Protection) Act, 1972, amended in 1983, 1986 and 1991 are the most important laws related to the
environmental management in India.

Some of the institutions responsible for the implementation and regulation of the above-mentioned environmental laws are as follows:

- Department of Environment in 1980 and the integrated Ministry of Environment and Forests in 1985; Department of Science and Technology; Department of Agriculture and Cooperation; Department of Biotechnology; Department of Ocean Development; Department of Space; Department of Non-Conventional Energy Sources; Energy Management Centre; Council of Scientific and Industrial Research, etc., at the Centre and Departments of Environment at the State and Union Territory levels;

- Central Pollution Control Board and State Pollution Control Boards;

- Central Forestry Board;

- Indian Council of Forestry Research and Education with specialized institutions for research in arid zones, forestry, moist and deciduous forests, wood technology, genetics, and tree breeding;

- Forest Survey of India (FSI) and the Wildlife Institute of India (WII) in addition to the existing organizations like the Botanical Survey of India (BSI) and Zoological Survey of India (ZSI);

- National Land use and Wasteland Development Council;

- National Wastelands Development Board;

- Indian Board of Wildlife;

3.2 ENVIRONMENTAL LAWS AND INSTITUTIONS FOR THEIR ENACTMENT AND IMPLEMENTATION

3.2.1 Water Act of 1974 and Air Act of 1981

The enactment of Water Act which was enacted by the Indian Parliament on March 23, 1974 provides the building blocks for the prevention and control of water pollution and maintaining or restoring of wholesomeness of water. This was done for the establishment, with a view to carrying out the purposes aforesaid of Boards for the prevention and control of water pollution, for conferring and assigning to such Boards powers and functions relating thereto and for matters connected therewith. It has resulted in the creation of Central and State Pollution Control Boards with the aim of prevention, abatement and control of water pollution. The Indian Parliament has no power to make laws for the states with respect to any of the matters aforesaid except as provided in articles 249 and 250 of the Constitution. As a result, in pursuance of clause (I) of article 252 of the Constitution, resolutions have been passed by all the Houses of the Legislatures of the States to the effect that the matters aforesaid should be regulated in those states by Parliament by law. Thus, this Act has resulted in the creation of Central and State Pollution Control Boards with the powers conferred on them to deal with all matters arising out of water pollution. The Air Act which was enacted by the Indian Parliament on 29th March, 1981 has puffed-up the mandate of the Central and State Pollution Boards to deal with the air pollution also.

The Central Pollution Control Board (CPCB) which forms part of the Ministry of Environment and Forests (MOEF) is a body consisting of experts in water and air pollution abatement drawn by the Central Government to protect the interest of key sectors like industry, agriculture, fishery, trade etc. It has representations from the
States (normally drawn from the members of State Pollution Control Boards) and Government owned companies and corporations. Generally, the members who represent industry, trade and agriculture are non-officials and providing for private sector participation in decisions associated to the design and implementation of policies regarding the prevention and control of water and air pollution.

The Central Pollution Control Board (CPCB) has to perform the following functions.

1. Advises the Central Government on any matter regarding the prevention and control of water and air pollution;

2. Co-ordinates the activities of State Boards and thwart disputes among them;

3. Provides technical assistance and guidance to State Boards, carry out and sponsor investigations and research relating to problems of controlling and abating water and air pollution;

4. Plans and organizes the training of persons engaged in programmes for prevention and abatement of water and air pollution;

5. Organizes a comprehensive programme through mass media regarding the prevention and control of water and air pollution;

6. Collects, compiles and publishes the technical and statistical data relating to water and air pollution and the measures devised for their effective prevention and control. It also prepares manuals and codes regarding the treatment and disposal of effluents and disseminate information connected therewith;

7. Lays down, modifies or cancels the standards for water and air quality in consultation with State Governments;
8. Plans and causes to execute a nation-wide programme for the prevention and abatement of water and air pollution; and

9. Perform such other functions as prescribed.

The functions of the State Pollution Control Boards (SPCB) as follows:

1. To plan a comprehensive programme for the prevention abatement of air and water pollution in the state;

2. To advise the State Government on matters concerning the control and abatement of water and air pollution;

3. To collect and disseminate information relating to water and air pollution prevention and abatement thereof;

4. To encourage, conduct and participate in investigations and research relating to problems of water and air pollution abatement;

5. To collaborate with the Central Board in organizing the training of persons engaged in the programmes for the abatement of air and water pollution;

6. To inspect effluent works and plants for the treatment of effluents;

7. To lay down, modify or annul standards for air and water pollution with regard to the standards of air or water quality laid down by the Central Board and the ambient air and water quality specific to the region or the water body;

8. To evolve economical and reliable methods for treatment of effluents with regard to peculiar ambient air and water quality of different regions;

9. To evolve methods for utilization of sewage and suitable trade effluents in the case of water pollution abatement;
10. To advise the State Government about the location of any industry causing air or water pollution;

11. To perform other functions as may be prescribed from time to time or be entrusted to it by the Central Board or the State Government.

According to the Water and Air Acts, the non-compliance of industries with the directions of the Boards is punishable by imprisonment of up to three months and a fine of up to Rs. 10,000. An additional daily fine of Rs. 5000 can be imposed for continued non-compliance. If the non-compliance continues beyond a period of one year after the date of conviction it can be punishable with imprisonment for two to seven years with a fine. The Board, if necessary, can also close down certain polluting factories.

### 3.2.2 Water Cess Act of 1977 and the Environmental Protection Act of 1986

The Water Cess Act which was enacted by the Parliament on 7th December, 1977 and again amended in 1988 provides for imposition of a tax or Cess on water consumed by certain industries and by local authorities. The main objective of this tax is to increase the resources of the Central and State Pollution Control Boards for the prevention and control of water pollution. The rate of tax applicable to various water polluting activities varies from Rs. 0.015 to Rs. 0.08 per kilo litre of water consumed. If some or all the activities liable to the payment of water Cess install effluent treatment plants, such activities are entitled to a rebate of seventy per cent of the tax payable. The proceeds of the Cess will be first credited to the Consolidated Fund of India and the Central Government may pay the Central Board or State Boards after deducting the cost of collection. The Central Government has to take into account the
tax collected by the State Government in deciding the amount payable to the State Board. Willful evasion of tax by the concerned parties can make them liable to imprisonment up to six months or fine up to thousand rupees or both.

The Environment Protection Act enacted by the Parliament on 26th May, 1986 is intended to remedy the lacunae noticed in the earlier laws and to serve as a single environmental legislation. This Act provides for the protection and improvement of environmental resources like water, land and air as per the decisions taken at the Conference on the Human Environment held at Stockholm in June, 1972. This Act has given the powers to the Central Government to take all such measures as it deems necessary for the protection and improvement of the quality of environment and preventing, controlling and abating environmental pollution.

In particular, the powers of the Central Government include (i) Coordination of actions taken by the State Governments; (ii) Planning and execution of nation-wide programmes for pollution abatement; (iii) laying down standards for the quality of environment in its various aspects; (iv) Laying down standards for emission of environmental pollutants from various sources; (v) Restriction of areas in which polluting activities shall not be carried out or shall be carried out with certain restrictions; (vi) Laying down procedures and safeguards for prevention of accidents that cause environmental pollution and for handling hazardous substances and examination of manufacturing processes and materials which are likely to cause environmental pollution; (vii) Carrying out and sponsoring investigations and research relating to problems of environmental pollution and establishment of environmental laboratories and institutes and (viii) Collection and dissemination of information and preparation of manuals and guides relating to environmental pollution abatement.

The Forest Policy in India was started under the aegis of the Resolution No. 13/52/ F, on 12th May, 1952, in the erstwhile Ministry of Food and Agriculture, Government of India. Despite this resolution, forests in the country have suffered serious depletion causing for the pressures arising from the increasing demand for fuel wood, fodder and timber, inadequacy of policing, diversion of forest lands to non-forest uses, and the tendency of Government to look to the forest as a revenue earning resource. That is why it was felt for having a comprehensive law covering forest conservation. The enactment of Wild Life Protection Act and the Forest Conservation Act by parliament in the years 1972 and 1980 respectively provides a basis for the current National Forest and Wildlife Protection Policy in India. The basic objectives of this Policy are as follows (Government of India, 1992):

- Maintenance of environmental stability through preservation and restoration of the ecological balance that has been adversely disturbed by serious depletion of the forests of the country;
- Conserving the natural heritage of the country by preserving the remaining natural forests with the vast variety of flora and fauna, which represents the remarkable biological diversity and genetic resources of the country;
- Checking soil erosion and denudation in the catchments areas of rivers, lakes, reservoirs in the interest of soil and water conservation, for mitigating floods and droughts and for the retardation of siltation of reservoirs;
- Checking the extension of sand-dunes in the desert areas of Rajasthan and along the coastal tracts;
- Increasing substantially the forest/tree cover in the country through massive afforestation and social forestry programmes, especially on all denuded, degraded and unproductive lands;
• Meeting the requirements of the rural and tribal populations for fuel wood, fodder, minor forest produce and small timber;
• Increasing the productivity of forests to meet essential national needs;
• Encouraging efficient utilization of forest produce and maximizing substitution of wood;
• Creating a massive people's movement with the involvement of women, to achieve these objectives and to minimize pressure on existing forests;
• Stringent provisions for preventing use of forest land for any other purpose;
• Setting up of the National Wastelands Board to guide and oversee the wastelands development programme by adopting a missionary approach for enlisting people's participation, harnessing the inputs of science and technology and achieving interdisciplinary coordination in programme planning and implementation;
• Formulation of a National Wildlife Action Plan;
• An exercise for preparation of a National Forestry Action Programme;
• Establishment of National Parks and Sanctuaries covering about four per cent of the country's area;
• Eco-development plans for Sanctuaries and National Parks;
• Identification of bio-geographical zones in the country for establishing a network of protected areas including seven Biosphere Reserves set up so far;
• Management Plans for identified wetlands, mangrove areas and coral reefs; and
• Formulation of a National River Action Plan.

Actions for Conservation of Biodiversity include:
• Intensification of surveys and inventorization of biological resources in different parts of the country including the island ecosystems. The survey should include information on distribution pattern of particular species/
• population/communities and the status of ethno-biologically important groups;
• Conservation of biodiversity through a network of protected areas including Biosphere Reserves, Marine Reserves, National Parks, Sanctuaries, Gene Conservation Centres, Wetlands, Coral Reefs and such other natural habitats of biodiversity. This should include taxonomic and ecological studies on the flora and fauna with adequate emphasis placed on the lower vertebrate, invertebrate and micro-flora which are important in contributing to the healthy maintenance of ecosystems;

• Full and correct rehabilitation of poor/tribal population displaced due to creation of national parks/ biosphere reserves/tiger reserves;

• Conservation of micro-fauna and micro-flora which help in reclamation of wastelands and revival of biological potential of the land;

• Protection and sustainable use of plant and animal genetic resources through appropriate laws and practices;

• Protection of domesticated species/varieties of plants and animals in order to conserve indigenous genetic diversity;

• Maintenance of corridors between national parks, sanctuaries, forests and other protected areas;

• Emulation and support for protecting traditional skills and knowledge for conservation;

• Development of methodologies to multiply, breed and conserve the threatened and endangered species through modern techniques of tissue culture and biotechnology;

• Discouragement of monoculture and plantation of dominating and exotic
species, in areas unsuited for them and without sufficient experimentation; and

- Restriction on the introduction of exotic species of animals without adequate investigations.

3.2.4 National Environmental Tribunal Act, 1995 and National Environment Appellate Authority, 1997

The National Environmental Tribunal Act has been implemented since 17 June, 1995. It emphasizes for (i) strict liability for damages caused by any accident while handling any hazardous substances and (ii) setting up a National Environmental Tribunal for efficient and prompt disposal of cases caused by such accidents in order to give relief and compensation for damages to persons, property and the environment.

This legislation has been considered unprecedented in the world for providing relief, compensation and restitution to victims of accidents during handling of hazardous substances and also for environmental damage. Some of the worth mentioning features of this Act are as follows:

1. There should be establishment of the tribunal with its benches in each State and Union Territory in a phased manner. In the first phase, besides the principal bench at Delhi, benches are proposed to be set up at Mumbai, Calcutta and Madras.

2. The Tribunal shall be guided by the principles of natural justice but shall not be bound by the procedure laid down in the Code of Civil Procedure. The Tribunal will be powered to regulate its own procedure; and also enjoy powers vested in a civil court while trying a suit in respect of summoning and enforcement of attendance of any person, taking evidence on oath and affidavits, powers
requiring the discovery and production of documents.

3. The aggrieved persons or entities and representative bodies in the field of environment can have access to tribunal by making an application. The Tribunal may, if satisfied after inquiry, admit the application for adjudication and if not satisfied, it may immediately reject the application after recording reasons. The Tribunal also has suo moto power to dispense justice to the victims of an accident.

4. The claims for compensation for damage will be entertained by the tribunal if they are presented within five years from the occurrence of the damage. No other civil court is entitled to entertain any claim or action entertained, tried or dealt with by the Tribunal. Appeals from the Tribunal will lie with the Supreme Court.

5. Tribunal's directions or orders will be binding on party or parties. Non-compliance will be punishable with an imprisonment up to three years or with fine which may extend upto Rs. 10 Lakhs or both. The orders will, however, be passed after the accused is given an opportunity to show cause. The Government of India has issued the National Environment Appellate Authority Ordinance on 30th January, 1997. The Ordinance provides for the establishment of a National Environmental Appellate Authority to hear appeals with respect to restriction of areas in which any industry, operations or processes or class of industries, operations or processes shall not be carried out or shall be carried out subject to certain safeguards under the Environment (Protection) Act, 1986 and for matters connected therewith or incidental thereto. This is to bring in transparency in the process, to bring in accountability and to ensure the smooth and prompt
implementation of developmental projects and schemes. Public hearings have become a part of environmental impact assessment. Also, the machinery is being set up for hearing appeals against environmental pollution impact assessment.

3.2.5 National Environment Policy, 2004

The National Environment Policy (NEP, 2004) 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. It is recognized that maintaining a healthy environment is not the state’s responsibility alone, but also that of every citizen. A spirit of partnership should thus be realized throughout the spectrum of environmental management in the country. While the state must galvanise its efforts, there should also be recognition by each individual – natural or institutional, of its responsibility towards maintaining and enhancing the quality of the environment. The NEP, 2004 is also intended to be a statement of India’s commitment to making a positive contribution to international efforts.

The NEP, 2004 has been motivated by the above considerations and is intended to mainstream environmental concerns in all development activities. It briefly describes the key environmental challenges currently and prospectively facing the country, the objectives of environment policy, normative principles underlying policy action, strategic themes for intervention, broad indications of the legislative and institutional development needed to accomplish the strategic themes, and mechanisms for implementation and review. It has been prepared through a process of extensive consultation with experts, as well as diverse stakeholders, and this process is also documented.

The NEP, 2004 is intended to be a guide to action: in regulatory reform,
programmes and projects for environmental conservation; and review and enactment of legislation, by agencies of the Central, State, and Local Governments. It also seeks to stimulate partnerships of different stakeholders, i.e. public agencies, local communities, the investment community, and international development partners, in harnessing their respective resources and strengths for environmental management. On the whole, it is expected to do better than fiscal neutrality, and likely raise substantial resources from outside the fiscal regime to realize its objectives.

_the Objectives of NEP 2004_

The principal objectives of this policy are enumerated below. These objectives relate to current perceptions of key environmental challenges. They may, accordingly, evolve over time:

- **Intra-generational Equity: Livelihood Security for the Poor:** To ensure equitable access to environmental resources and quality for all sections of society, and in particular, to ensure that poor communities, which are most dependent on environmental resources for their livelihoods, are assured secure access to these resources.

- **Inter-generational Equity:** To ensure judicious use of environmental resources to meet the needs and aspirations of present and future generations.

- **Integration of Environmental Concerns in Economic and Social Development:** To integrate environmental concerns into policies, plans, programmes, and projects for economic and social development.

- **Efficiency in Environmental Resource Use:** To ensure efficient use of environmental resources in the sense of reduction in their use per unit of
economic output, to minimize adverse environmental impacts.

- **Environmental Governance**: To apply the principles of good governance (transparency, rationality, accountability, reduction in time and costs, and participation) to the management and regulation of use of environmental resources.

- **Enhancement of Resources for Environmental Conservation**: To ensure higher resource flows, comprising finance, technology, management skills, traditional knowledge, and social capital, for environmental conservation through mutually beneficial multi-stakeholder partnerships between local communities, public agencies, and investors.

3.2.6 National Environment Policy 2006

The present national policies for environmental management are contained in the National Forest Policy, 1988, the National Conservation Strategy and Policy Statement on Environment and Development, 1992; and the Policy Statement on Abatement of Pollution, 1992. Some sector policies such as the National Agriculture Policy, 2000; National Population Policy, 2000; and National Water Policy, 2002; have also contributed towards environmental management.

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 seeks to extend the coverage, and fill in gaps that still exist, in light of present knowledge and accumulated experience. It does not displace, but builds on the earlier policies.
Objectives of the National Environment Policy, 2006

The principal Objectives of this policy are enumerated below. These Objectives relate to current perceptions of key environmental challenges.

➢ Conservation of Critical Environmental Resources:

To protect and conserve critical ecological systems and resources, and invaluable natural and man-made heritage, which are essential for life-support, livelihoods, economic growth, and a broad conception of human well-being.

➢ Intra-generational Equity: Livelihood Security for the Poor:

To ensure equitable access to environmental resources and quality for all sections of society, and in particular, to ensure that poor communities, which are most dependent on environmental resources for their livelihoods, are assured secure access to these resources.

➢ Inter-generational Equity:

To ensure judicious use of environmental resources to meet the needs and aspirations of the present and future generations.

➢ Integration of Environmental Concerns in Economic and Social Development:

To integrate environmental concerns into policies, plans, programmes, and projects for economic and social development.

➢ Efficiency in Environmental Resource Use:

To ensure efficient use of environmental resources in the sense of reduction in their use per unit of economic output to minimize adverse environmental impacts.
➢ **Environmental Governance:**

To apply the principles of good governance (transparency, rationality, accountability, reduction in time and costs, participation, and regulatory independence) to the management and regulation of use of environmental resources.

➢ **Enhancement of Resources for Environmental Conservation:**

To ensure higher resource flows, comprising finance, technology, management skills, traditional knowledge, and social capital, for environmental conservation through mutually beneficial multi stakeholder partnerships between local communities, public agencies, the academic and research community, investors, and multilateral and bilateral development partners.

3.3. **ALTERNATIVE INSTRUMENTS AND INSTITUTIONS FOR POLLUTION ABATEMENT**

Non-market policy instruments include command-and-controls (CAC). Market based instruments consist of pollution taxes (Pigou, 1932) and marketable pollution permits (Dales, 1968). These are often referred to as economic instruments. The choice between these instruments depends both on their efficacy in achieving the target level of emissions as well as on the relative size of welfare losses they produce (Baumol and Oates, 1988). Government can use non-market policy instruments, market based or economic instruments or a combination of two.

3.3.1 **Command and Controls (CAC)**

The CAC instruments are in the form of fines, penalties and threats of legal action for closure of the factories and imprisonment of the owners. They can be used either for facilitating the use of specific technologies for the environment management or for the realization of specific environmental standards. It can be shown that the cost
of imposing and implementing compliance are generally higher when CAC
instruments are used than with economic instruments. Furthermore, under CAC
instruments, there can be no incentives for firms to innovate or invest in more efficient
pollution control technologies or in cleaner process technologies.

3.3.2 Economic Instruments

Economic instruments can be divided into three categories: price based
instruments, quantity based instruments and hybrid instruments. These instruments are
often called as market based instruments. Together with supply-demand forces of the
market they achieve efficiency even with the presence of environmental externalities
like air and water pollution.

3.3.2.1 Price Based Instruments

The price based instruments are first suggested by Pigou in 1931 in the form of
taxes and subsidies to deal with detrimental and beneficial environmental externalities
in production and consumption. Instances are pollution taxes on a polluting
commodity either through its production (paper, leather, electricity etc.) or
consumption (cigarette, packed food etc.) or on a polluting input (fuel inputs,
chemicals etc.). It could be a tax on either polluting output or pollution load. Also,
they can be subsidies on the commodities the production of which generate
environmental benefits (e.g., neighbor’s rose garden giving one the free benefit of
beauty). The pollution tax or Pigouvian tax is a corrective instrument to realize the
socially optimal level of economic activity generating pollution.

Pollution tax could be interpreted as the price the polluter has to pay for using
the waste disposal services from the environmental media. Since the market is missing
for the waste disposal service, this price could not be determined in the market. The
supply and demand schedules for this service could not be observed in the market. However, given the property right to the environmental resource to the public or government, environmental regulation by the government or public could make the polluter liable to pay a price for the waste disposal service. The polluter pays the price in the form of cost he incurs for complying with the environmental regulation. Therefore, the marginal cost of pollution abatement or the cost the polluter is willing to incur for reducing every successive unit of pollution abatement (MCA) could be interpreted as the demand price of waste disposal service. The demand curve for the waste disposal service is the falling MCA or demand price with respect to the pollution load generated. Alternatively, it could be seen as the curve depicting the rising MCA with respect to the pollution load reduction.

There is an opportunity cost or health and other damages suffered by the public by allowing the pollution. The supply price of waste disposal service is the price charged to the polluter by the government or public for every unit disposal of waste into the environmental media. Therefore, the marginal damages (MD) or damages from every successive unit of pollution that the public is willing to bear could be interpreted as the supply price of waste disposal service. The supply curve of waste disposal service is the rising marginal damages (MD) or supply price with respect to the pollution loads.

The damages from pollution are felt by a large number of people (more so with water pollution). Therefore, the damage from a unit of pollution at margin is the sum of marginal damages to all the affected people. Therefore, to design a Pigouvian tax, we require the information about abatement cost functions of polluting firms and
damage functions for all the affected people. The cost of collecting the information to estimate these functions can be prohibitively high.

3.3.2.2 Quantity Based Instruments

D.H Dales (1968) has suggested an alternative to the pollution tax, a system of tradable pollution rights for the management of environment. He has proposed that the property rights be defined to the use and abuse of environment such entitlement be offered for sale to the highest bidder. This system is like a tax to achieve the specified environment target at a minimum cost. For example in the case of air pollution, this approach first determines the optimal level pollution in a given geographical area. This level of pollution to be tolerated is then divided into a number of permits among the various polluting units within the area (either by free distribution or by auctioning). Firms which are already comparatively more efficient in controlling their wastes or pollution (the ones that face lower unit cost for pollution control) may continue their original level of production and emissions. But they will have some extra pollution permits (or entitlements) to spare. They can sell such extra permits to firms which are less efficient in controlling their wastes (the ones that face higher unit costs for pollution abatement). Provided monitoring is possible and effective, the net result is that total pollution is kept within the prescribed levels. The more efficient firms will sell their surplus permits to less efficient firms which require more permits in order to continue with original production plans. In this process, a market for pollution permits is created in which trading in permits takes place up to the point at which the aggregate supply of permits is equal to the aggregate demand for permits and the equilibrium permit price is equal to the marginal cost of abatement to each firm.
3.3.2.3 Mixed Instruments: A Practical Approach

In practice, we should have a mixture of both command and controls and economic instruments. Economic instruments alone may not be feasible because of high their imposition requires lot of information on firm level emission, technology etc., which are not easy to come by. Command and control measures alone are inefficient measures (they may result even in the use of costly pollution abatement technologies by the firms). Similarly, the estimation of damages to affected people in the case of pollution tax, and knowing a priori the optimal level of pollution in the case of tradable permits pose practical problems for the design of economic instruments. Fixation of pollution standards ..... MINAS, a priori by Pollution Control Boards and using either pollution tax or marketable permits instrument to induce the polluter industry to meet those standards is a hybrid method using regulatory and economic instruments. However, in this case the criterion for fixation of environmental standards is a subject of debate about whether they have to be decided on scientific basis or on the basis of referendum or political process. Scientifically, they have to be based on the evidence concerning the effects of air pollution on health or of polluted water on fish and human life. They can be alternatively decided through a political process by having referendum on the choice among alternative sets of pollution standards. Still, there are issues such as should they be at state levels or national, should the standards be compromise between the industry and people and so on.

3.4 ECONOMIC INSTRUMENTS IN INDIA

The environmental legislations provide for the blueprint and use of economic or market-based instruments such as pollution taxes and marketable pollution permits in India. These instruments are considered as remedial measures in the free-market
processes in order to deal with the externality of environmental pollution. They are
called market-based instruments because they facilitate the market to function
efficiently even with the environmental externalities. One of the important features of
economic instruments is that they facilitate the choice of least cost pollution
abatement technologies.

The cost of designing and implementing the Pigouvian tax is massive since it
requires the estimates of marginal damage and abatement cost functions. As
environmental pollution is an externality affecting the people in large number, the cost
of estimating damage functions can be prohibitively high. Thus, for practical
purposes, the tax-standard method is normally used in which the environmental
standards are exogenously given so that a pollution tax can be designed and levied on
the polluting firms in order to encourage them to spend on pollution abatement for
achieving the set standards. Some countries of Western Europe are currently using
the tax-standard method for controlling environmental pollution while the United
States of America is using the marketable pollution permits method.

The use market-based instruments have not still been started in India and
various legislations existing are of the command and control type of regulatory
measures. Though command and control measures do not provide the necessary
incentives to the polluters for the choice of least cost methods of pollution control, so
far the Government of India has resorted only to such measures for controlling
industrial pollution. In contrast, fiscal instruments like pollution taxes or marketable
pollution permits though also coercive, provide incentives to the factories for adopting
the least cost pollution abatement technologies. Satirically, no serious efforts have
been made in India so far for using such instruments for controlling industrial
pollution. The currently levied tax on the consumption of water by industrial activities cannot be treated as a pollution tax, because its main goal is to raise revenue for the Pollution Control Boards. The tax collected is very nominal ranges between Rs. 0.015 to 0.07 per kilo litre which usually does not have much effect on industrial demand for water. Some of the research studies on water pollution abatement in India have found that the pollution tax on industrial water use should be several times higher than the current rate of water Cess in order to achieve the set water quality standards. One study made in the year 1989 estimates the cost of treatment per a kl of residual water at 1987-89 prices at Rs. 3.60 for the paper and pulp industry, Rs. 2.61 for oil refineries, Rs. 2.21 for chemicals and Rs. 1.64 for sugar. Another study carried out in 1994, estimates the marginal cost of abatement for the reduction of 100 mg of bio-oxygen demand (BOD) in the residual water of the paper and pulp industry at Rs. 0.38 at 1991-92 prices. Yet another study conducted in 1996 has found that the pollution tax per 100 mg reduction of chemical oxygen demand (COD) by the Indian manufacturing industry for realizing the standard of 250 mg per kl of residual water is Rs. 0.32 at 1995-6 prices.

One more incongruity of the choice of instruments for industrial pollution control in India is the widespread use of subsidies for the polluting parties. In fact in order to make a necessary correction for market failure, the pollution taxes should be imposed on a polluting activity. In contrast, pollution subsidies provide vicious incentives to industries for increasing their scale of production and hence environmental pollution. There is an important case in which subsidies or financial incentives for industrial units are justified for the control of industrial pollution in India. During the early phase sixties, several State Governments in India came out
with legislation in aid of industrial estates with the objective of promoting small-scale industries and achieving balanced regional development. More than 800 items were reserved for exclusive production by small-scale enterprises. Small scale enterprises are also entitled to financial assistance, tax benefits and subsidized electricity and water charges. Consequently, the industrial estates in various parts of the country are dominated by small and medium scale industries creating a number of environmental problems. These problems includes: insufficient understanding of the technology of waste generation and treatment, lack of required space for pollution control facilities, fruitless supervision and management of even simple installations for pollution control and lack of technical assistance. Thus, governmental assistance to small-scale enterprises may be justified for helping them to circumvent these problems.

3.5 COLLECTIVE ACTION

The Public Trust Doctrine is one of the foundations on which democratic societies were built and it rests on the principle that certain resources such as air, water, and forests are of such great importance to society as a whole that the government is entrusted with protecting these resources for the enjoyment of everyone. Effective public participation increases the credibility of government institutions responsible for executing the public trust by ensuring an open and inclusive decision-making process. When civil society and other stakeholders feel they have an understanding and voice in the decision-making process, public confidence in the fairness of the decision increases. Conversely, lack of meaningful public participation creates perceptions of undue influence or corruption that project proponents or industry may have over the regulatory system and regulators. Effectively involving the public in the decision-making process helps to promote the
accountability of government agencies and ensure that they are acting in the public interest. Participatory democracy also requires the involvement of all levels of government and society, including formal and informal institutions. There are a growing number of examples from developing countries reflecting the recognition of the value of strengthening the instruments and institutions for multi-stakeholder consultation and public participation in environmental management.

Throughout the world, Collective action has been emerged as an alternative institution to economic instruments such as pollution taxes in order to deal with environmental problems. Coase (1960) has explained that there is no need for pollution taxes or Pigouvian taxes to deal with market failures associated with externalities like environmental pollution. Given the initial property rights to either the externality generator or the receiver, the costless bargaining between them in a free market will result in the optimal control of the externality, the final outcome being independent of the initial allocation of property rights. Some countries are using Coasean tradition in order to deal with externalities.

For instance, environmental management in Japan has been done through collective action involving local communities, government and industries. The bureaucracy or government plays only catalytic or advisory role in promoting collective action between industry and local communities. In India also, the Coasean prescription has been put to practice to deal with some specific cases of environmental management especially in cases of water pollution abatement in industrial estates containing small-scale enterprises, management of local village forests and commons in rural areas etc.

The scale of economies present in pollution abatement, particularly in water
pollution abatement has compounded problems for industrial estates in India. In such a state of affairs, it is not cost-effective for small-scale enterprises to have their own individual effluent treatment plants. It is required for them to collaborate within the industry or estate to realize cost effective environmental protection. In India, Collective action involving the factories, affected parties and government for water pollution abatement is seen as an alternative institution in order to deal with the problem of water pollution abatement in industrial estates. Collective action in industrial water pollution abatement is intended to bring about the essential institutional changes that are attuned with the choice of cost saving technologies. If essential legislation is in place to define the property rights of factories and the affected parties, a common effluent treatment plant (CETP) can be established which results in costs saving to factories and the diminution in damages to the affected parties. To encourage collective action in industrial water pollution abatement some incentives for polluters, affected parties and the Government are as follows:

**Incentives for the polluters:**

- It is easy for a club to secure financial support from the Government and NGOs.
- CETP is less expensive in terms of capital and operation cost.
- Water can be treated economically with the help of CETP to produce process grade water which can be reused and recycled in the industry. It is a vital inducement to form a club in water scant regions.
- The size of an industrial estate depends upon water availability and the facility to dispose waste water on a sustainable basis. A CETP may help achieve both these objectives.
Incentives to Affected Parties:

- Enhanced and better quality of drinking water
- Diminution in damages from water borne diseases
- Recreational facilities from the conserved water body
- Diminution in the cost of legal action against polluters
- Improved access to legal institutions

Incentives to the Government:

- Reduction in the burden of various governmental agencies running for abatement and control of water pollution.
- Decency for a catalytic role rather than the disrespect for a coercive role.

The interdependency in collective action in industrial water pollution abatement and the benefit of all the pertinent parties shows that collective action concerning polluters, affected parties and the Government is practical. It also take into consideration the role of different parties, particularly the role of the Government.

Recent studies in India about the implementation of CETP technologies by some industrial estates in Andhra Pradesh, Haryana and Tamil Nadu clearly provide proof for the role of collective action involving people affected by pollution, the factories, NGOs and the Government. There are three processes involved in the collective action for control of water pollution on an industrial estate. These are (a) collective action of affected parties; (b) collective action of factories and (c) bargaining between a coalition of affected people and a coalition of factories. The collective action of affected people is possible, if the damages from pollution are substantive enough, to justify the transaction costs of coalition and bargaining. Given the threat of collective action from the affected people, factories on an industrial
estate have to take recourse to pollution abatement methods. The available pollution abatement technologies may provide the small factories a broad spectrum of technological choices out of which the common effluent treatment plant may be the least cost technology. Therefore, collective action by factories can be technology driven. Finally, bargaining between a coalition of affected people and a coalition of factories produces the end result of collective action, which is a realization of the prescribed environmental standards.

 Peoples' Participation in Environmental and Forest Management:

The National Forest Policy, 1988 encompasses people’s participation in the development and protection of forests to accomplish the objectives of providing fuel wood, fodder and small timber to local communities as well as to develop the forests for improving the environment. The MOEF issued guidelines in 1990 in order to implement this policy prescription to involve village communities in the development and protection of degraded forests on usufruct basis. The concept of Joint Forest Management (JFM) was accordingly initiated and extended to all states and Union Territories for operationalizing the same by developing appropriate mechanisms. So far seventeen states have issued their resolutions for JFM. As per reports received from nine states, 4.05 million hectares of degraded forests in the country are being managed and protected through approximate 40,300 village Forest Protection Committees.

The institution of JFM involves the participation of village communities, NGOs, and state forest departments in the management of forest lands in the manner described below:

• The programme should be implemented under an arrangement between the
voluntary agency/NGO, the village community (beneficiaries) and the State forest department

- No ownership or lease rights over the forest land should be given to the beneficiaries or to the voluntary agency. Nor should forest land be assigned in contravention of provisions contained in the Forest (Conservation) Act, 1980.

- The beneficiaries should be entitled to a share in usufruct to the extent and subject to the conditions prescribed by the State Government in this context. The voluntary agency should not be entitled to usufructuary benefits.

- Access to forest land and usufructuary benefits should be only to the beneficiaries who get organized into a village institution, especially for forest regeneration and protection. This could be the Panchayat or a cooperative of the villagers, with no restriction on membership.

- The beneficiaries should be given usufruct rights in produce like grasses, lops and tops of branches, and minor forest produce. If they successfully protect the forests, they may be given a portion of the proceeds from the sale of trees when they mature. The Government of West Bengal has issued orders to give 25 per cent of the sale proceeds to the village Forest Protection Committees.

- The selected site should be worked in accordance with a working scheme, duly approved by the State Government. The working scheme should be prepared in consultation with the beneficiaries.

- For raising nurseries, preparing land for planting and protecting the trees after planting, the beneficiaries should be paid by the Forest Department from the funds under the social forestry programme.
• It should be ensured that there is no grazing at all in the forest land protected by the village community. Permission to cut and carry grass free of cost should be given so that stall feeding is promoted.

• Along with trees for fuel, fodder and timber, the village community may be permitted to plant such fruit trees as would fit in with the overall scheme of afforestation.

• The benefit of people's participation should go to the village communities and not to commercial or other interests which may try to derive benefit in their names.

Sport
**National Parks and Sanctuaries: An Example of the Implementation of Provisions of Wildlife Protection Act, 1972**

• To be a comprehensive and uniform legislation for protection of wildlife throughout the country.

• To prevent and regulate hunting of and trading in wildlife or any product thereof.

• To lay down the procedure for the establishment maintenance and administration of areas as sanctuaries and national parks.

By the 42nd Constitution Amendment, 1976, forests were removed from the State list and included in the concurrent list (list of rights and duties common to State and Central Government). This Constitutional Amendment also provides for protection and improvement of the environment and safeguarding forest and wildlife in the Directive Principles of State Policy and declares that it is the fundamental duty of every citizen to protect and improve the natural environment including forests and wildlife.

The State Governments may declare any area to be a sanctuary or national
park, if they consider the area to be of adequate ecological significance for the purpose of protecting, propagating or developing wildlife and its environment. The difference between a sanctuary and a national park is that in a national park there is a virtual cessation of human activities. As of now, there are about 80 national parks and 441 sanctuaries in India covering 4.5 per cent of the total land mass.

The experiences of management of many wildlife parks and sanctuaries in India show that there is a conflict between the parks and people. In developing countries the tradeoff between economic efficiency and equity can not be ignored in the management of wildlife. A recent study of a national park known as Keoladeo National Park in Rajasthan State of India by Murty and Menkhaus (1994) sharply brings out this point. This small 2,873 hectare park contains over 400 different avian species, as well as several mammalian and reptilian species. Different ecosystems including wetland, woodland and grassland areas are found in this limited space.

As is the case with many national parks in developing countries, there is an asymmetry in the distribution of costs and benefits from wildlife protection in the case of Keoladeo National Park. While the benefits may mainly accrue to non-local national and international communities, the costs are mainly borne by the local communities. The estimate made by Murty and Menkhaus (1994) show that there are significant user and option value benefits for the national and international tourists visiting this park. Also, they have found that there are significant income losses to the local rural households. The Union Government and the Rajasthan State Government incur annual investment and operational expenditures on the park. This problem of equity can be solved by using instruments like entry fees and wildlife protection or environmental tax for capturing benefits to the users and redistributing them to the
local communities.

3.6 ROLE OF THE STATE IN ENVIRONMENTAL PROTECTION

The state has a major role to play in environmental protection through containing or mitigating environmental pollution caused by different economic agents such as industries, construction, mining etc. But there is considerable disagreement among the experts on the role of the state and policy prescriptions for environmental protection. This is mainly because valuation of environmental resources, particularly, their non-use values, is subject to a wide margin of error (Sankar, 2001).

However, there is some agreement that there are three broad categories of instruments available to the state for environmental protection (Kuik, et al, 1997). Instruments aimed at voluntary adaptations of individual and group behavior in a more environment friendly direction. This category, referred as "communicative Instruments", includes, among others:

a) Provision of knowledge and information in all possible forms on the environmental effects of the present behaviour and on 'Cleaner' alternatives.

b) Moral suasion, i.e., campaigns to persuade people and institutions to change their behaviour.

c) Institutionalization of environmental management within firms and other organizations.

d) Voluntary commitments by trade and industry or agreements between them and the government for better environmental management.

e) Instruments, which affect the market conditions under which people and firms make their decisions. This category is commonly referred to as 'Economic
Instruments'. This would comprise among others, the following:

I. Charges and taxes, which make polluting behaviour more expensive.

II. Subsidies and other types of financial support, which make environmentally friendly behaviour relatively economical.

III. Deposit refund systems, in which a deposit for a potential polluting product is being paid by the purchaser, which can claim a refund after returning the product or showing that the pollution did not take place.

IV. Liability legislation, requiring the polluter to compensate the environmental damage caused, and thus providing a financial incentive for pollution prevention.

Instruments, which influence the range of alternatives by means of prohibitions, restrictions, or obligations ('direct regulation'). These are called Command and Control (CAC) instruments. This can be done by introducing product, process or emission standards, by prescribing how certain activities have to be performed, demanding certain professional skills, specifying the precautionary measures to be taken, etc. Outright bans on certain activities, products or substances also belong to this category.

Thus, there are a large variety of instruments available to the policy makers of the state for the protection of the environment. However in practice, the scope of choosing between alternative instruments is limited by various factors. While the 'communicative instruments' may be the most feasible to pursue and may be the most acceptable, it may not be effective. This could be due to lack of strong will among the polluters as implementation of pollution abatement measures involves costs.
Even the 'economic instruments', though may be more attractive, particularly, subsidies should fit in with the legal and institutional framework and it should be technically and administratively feasible. The information needed to apply the instrument has to be available.

Further, there should be enough support or at least, not too much opposition against the instrument in society, to prevent sabotage and to keep enforcement costs reasonably low. This is particularly true with reference to Command and Control (CAC) instruments. Therefore, the actual mix of policy instruments chosen for environmental protection may vary from country to country depending on its goals, stage of development, institutional capabilities and political preferences (Sankar, 2001).

The environmental policy regime in India is not totally bereft of economic incentives to control pollution, though these are not prominent. The Government of India offers several incentives to ensure that industries are motivated to comply with various environmental standards prescribed under different Acts and Rules to control and prevent pollution. Some major fiscal incentives are (Karnataka State Pollution Control Board, 2000).

- Exemption from Income Tax for contribution of corporate sector and private individuals made to programmes on conservation of nature and natural resources.
- Depreciation allowance at 30% is allowed on devices and systems installed by Industrial units for minimizing pollution or for conservation of resources.
- Investment Allowance at the rate of 35% of the actual costs of new machinery or plant is granted if it assists pollution control and environment protection.
- Capital Gains Tax exemption to encourage industries to shift from congested
The onset of economic reforms in July 1991 and the subsequent deregulation for Foreign Direct Investment (FDI) led to the apprehension that the Government might relax its environmental laws to attract more FDI and it would encourage relocation of environmentally polluting industries from the developed world into India. But pollution control laws have not been relaxed in the process of economic reforms, for large and medium-scale industries though they have been relaxed in the case of small-scale industries as it has been assumed that they do not undertake hazardous processes (Kuik et al., 1997).

But small industries tend to cause more pollution due to inefficient production methods, inferior equipment, poor housekeeping and inability to adapt proper treatment technologies (Planning Commission, 2001). In order to encourage cleaner production, the government of India extends incentives like custom duty waiver, soft loans, etc and provides other concessions for installation of pollution control equipment in industrial units (Planning Commission, 2001). An important decision taken by the SPCBs in the 90s is to promote common effluent treatment plants for SSIs, where they are located in clusters and recover part of the cost from them. But where SSIs are not located together, such facilities have not been available and they are allowed to release the effluent into municipal drains or streams without treatment (Kuik et al., 1997). On the whole, the progress made with respect to common effluent treatment plants in SSI clusters may be, at the most, minimum.

Today, SSIs have to obtain consent from the Central Pollution Control Board (CPCB) only in the case of 17 industries, which have been categorized as highly polluting is listed below.

- Fertilizers (Nitrogen/Phosphate)
Sugar
Cement
Fermentation and distillery
Aluminum
Petrochemicals
Thermal power
Oil refining
Sulphuric acid
Tanneries
Copper smelter
Zinc smelter
Iron and steel
Pulp and paper
Die and die intermediates
Pesticides manufacture and formulation
Basic drugs and pharmaceuticals

In India, the development of the theory of environmental policies has gone through three phases. The first is related to the investigation of market failures and prisoners' dilemma type of problems, the second is about a purely government solution, and the third is that of institutional alternatives in which the market plays an important role. The empirical evidence for environmental degradation under free market management in the first phase may be ascribed to the somewhat underdeveloped market institutions to cope with environmental externalities. The failure can be attributed to the absence of property rights to environmental resources and supporting legal systems.