CHAPTER - VI
ENVIRONMENT

Preserving the ecosystem for protecting the environment has become a major challenge all over the world. The developing countries in order to develop their economy have failed to protect the environment. Knowing the environmental degradation and foreseeing the calamity that is going to happen in future, the United Nations (UN) took a cautious step by inviting the member countries to discuss on the subject “Human Environment” at Stockholm in 1972. The conference tried to find ways for controlling and regulating the environment which surrounds the human beings and also in which the human beings are a part.

The International Conference on Human Environment declares

a) **Man has the fundamental right to freedom, equality and adequate conditions of life, in an environment of quality that permits a life of dignity and well being, and**

b) **Man bears a solemn responsibility to protect and improve the environment for present and future generations.**

Even before this, the first indication of UN concern was manifested in the objectives of Bruch Plans in 1948 for the regulation and control of atomic energy which in the course of time led to the establishment of International Atomic Energy Agency (IAEA).

The term “Environment” which has been drawing the attention of several National level and International level organisations cannot be defined in a simple way. It has different meaning to different people. To some it means fresh clean air and pristine
waters; to others, it means their man-modified neighbourhoods (or) immediate surroundings. Still others relate “Environment” to “Ecology” and think of plant animal interrelationships. But it is a combination of all these aspects. It includes not only the areas of air, water, plants and animals, but also other natural and man-modified features which constitute the totality of our surroundings.

This different meaning of the term “Environment” implies its complex nature. The New Encyclopedia Britannica defines it as a “complex of physical, chemical and biotic factors that act upon as organism (or) an ecological community and ultimately determine its form and survival.” Macropaedia “deals with earth’s environment, “biosphere” deals with the relationship between the principal systems and components of the environment, “ecosystem” treats the major territorial and aquatic eco-system of the earth, the pollution of the environment and the conservation of its natural resources are treated in conservation of natural resources. This chapter deals about the latter aspect viz. pollution of the environment and the conservation of its natural resources.

When and why does the environment get polluted? The answer to this is provided by defining the term “pollution”. “Pollution is the presence, in the environment, of matter (or) energy whose nature, location (or) quantity produces environmental effects undesirable for human.” Pollution is considered as an unfavourable alteration of the environment by the human beings either partially (or) fully. However, Daniel H. Henning and others say that the definition of pollution depends upon the public decisions concerning proper use of the environment and determination of tolerable levels of pollution.

Pollution occurs when environmental changes create (or) are likely to create nuisance (or) hazards to public health, safety (or) welfare (or) when they are harmful to domestic, industrial, agricultural, recreational (or) other legitimate uses of environmental components (or) livestock, wildlife, fish aquatic life and other biological species.
As a process, pollution contaminates (or) alter the quality of some portion of the environment through the addition of harmful impurities. Pollution is not a series of unrelated problems concerning air, water, the sea, land dereliction and the like. It is a single problem concerning waste, which often may be disposed of in a number of different ways.\footnote{\textsuperscript{8}}

Pollution of environment essentially means that a source whether natural (or) man-made is rendered unfit for some beneficial use due to physical, chemical (or) biological factors.\footnote{\textsuperscript{9}} Pollution is an inevitable consequence of most human activity. Most of the ecological ills are the product of several factors in different and often interacting combinations. Recent economic development reveals that “Trade Free Zone” established to boost exports in developing countries have nowadays become major polluting force and epicenter of environmental degradation.

The scientific and technological innovations contribute to environmental problems by creating new substance, new techniques with potentially serious environmental risks. The limited understanding of the causes and consequences of ecological degeneration is also one of the factors of environmental pollution.\footnote{\textsuperscript{10}} Unplanned, illegal and unserviced urban growth is carrying yet another environmental problem. The human greed in converting the agricultural land into residential (or) commercial areas have changed the ecosystem.\footnote{\textsuperscript{11}}

The delay and difficulty in programme implementation sometime provide the opportunity for the pollutants to spread over and cause pollution. Besides these factors, the traditional pollution causing areas such as air, water, toxins, consumer wastes, soil erosion, mining, destruction of flora and fauna etc., have affected the environment. This happens due to too much exploitation of the natural resources. However, trends vary greatly between individual pollutants. In general acute local pollution has become very rare, whereas widespread low-level pollution has been increasingly recognized as a potential problem.\footnote{\textsuperscript{12}}
Environmental pollution has become a multi-disciplinary field of study wherein, people from different areas have studied the causes and consequences of the environmental pollution. The major kinds of environmental pollution are air-pollution, water pollution, solid-hazardous waste pollution, noise pollution, etc.

**Air Pollution:**

The major component of the biosphere is air, without which living organisms cannot survive (except some lower forms of bacteria). For a healthy life, pollution-free air is essential. But pollution-free air of late has become very rare especially in highly urbanised and industrialised areas. The occurrence of air pollution is mentioned by the World Health Organisation (WHO) as "substances enter into air by the activity of mankind cause harmful effect to his health, vegetables, property (or) to interface with the enjoyment of his property".  

Air pollution is normally associated with concentrated population, industrial growth and high motor vehicle use which are the characteristics of urban areas. Major chemicals that pollute the air are sulphur-dioxide, carbon monoxide, carbondioxide, nitrogen oxide and suspended particles which exist naturally in the atmosphere. When the level of these materials exceed the standard and become harmful to life, the air is said to be "polluted air".

Air pollution was recognised as a problem after the smog incident which took place in London in 1952 where many deaths had occurred. One of the most serious consequences of air pollution is possible climatic changes generated by the increasing concentration of carbondioxide in the atmosphere. This carbondioxide content results subsequently in "Green House Effect" by retaining long wave radiation. This change will have maximum impact on highly populated countries like India, Bangladesh, Pakistan, Indonesia etc.
Another global air quality problem is the depletion of stratospheric ozone presumed to be largely due to the release, into the environment, of chlorofluorocarbon used as propellants in most aerosol products as refrigerants - and in many industrial processes. The concentration of ozone in the stratosphere declined on an average of three percent between 1979 and 1986 and over the poles by 30 to 40 percent and up to 60 percent during the seasonal ozone\textsuperscript{16} hole over Antarctica.

Ozone serves to reduce the amount of ultra violet radiation, thereby protects the human population from skin cancer and also inhibiting declines in agricultural and marine productivity. Besides the above two consequences, the air pollution results in damaging materials and buildings (sulphur dioxide contributing to early aging and damaging of a variety of materials), poor visibility (air pollution diminishes the visibility, obscuring scenic and aesthetic views and interfacing with safe transportation) and climatic, acid rain and other global effects (the gases such as nitrogen oxide and sulphurdioxide when they come along with rain, transformed into acids thereby affecting soil, crops, plants, lakes etc).

Unlike water pollution, air pollution can drift high (or) low and in any direction depending on the wind and weather. If water is polluted, one can avoid drinking polluted water, but in the case of air pollution, one has to inhale it as it comes. So, one cannot do away with air pollution. Utmost what can be done is to control air pollution. There are several methods which help in controlling air pollution - zoning, air-pollution control at source,\textsuperscript{17} installation of controlling devices and equipment, construction of high stacks (chimneys) to discharge the pollutants at higher altitudes and by growing vegetation.

It has been advised that to reduce and control carbon dioxide emission, the levels of cutting and burning of tropical rain forests is to be reduced and also the amount of carbon dioxide which is generated by burning of fossil fuel is to be reduced.
Train (1976) stated that the fundamental process to be followed, notwithstanding the comprehensive nature of air pollution control is to combine emission limitations and land use planning. Morell (1974) has expressed this two pronged approach succinctly. "A judicious combination of pollution control technology and more responsible land use decision making in the environmental age provides the only effective long-term solution to the problems of air pollution."

SOLID AND HAZARDOUS WASTES:

In many industrialised societies, raw materials are extracted, refined, processed and transformed into finished products. During this process large quantities of wastes (both liquid and solid) are produced. These solid and liquid wastes are toxic and hazardous. Solid wastes include sludge and other solid, liquid semi-solid and gaseous waste materials.

These solid wastes are disposed of in landfills, open dumps (or) impoundments where pollutants can often reach into surface and ground waters. This is how environment gets polluted. In reference to solid and hazardous waste problems on a global level, the International Register of Potentially Toxic Chemical of UN Environment Programme (UNEP) indicates that each year hundreds of millions of tons of hazardous industrial wastes are produced and they are discarded with little regard for human health and environment.

The International register goes on to recommend that in view of our "IGNORANCE", there is a vital need for an international clearing house for scientific, technical, legal and regulatory information for assessment and control of chemical hazards.

There are several ways by which these solid wastes can be disposed of. Many of the multinational companies, shifting their factories (that manufacture hazardous
substances) outside the national boundaries where regulations are imposed regarding disposal of solid wastes. However this method is facing restrictions. Land prices, environmental regulations and public opposition prevent numerous acceptable sites from being used as land filling. As a result, efforts are made to eliminate wastes at all levels of extraction, manufacturing, transportation and consumption.

Countries like USA are recommending suitable sites for the disposal of solid wastes. They have also suggested steps to select suitable sites. Although selection of sites for waste disposal may not provide solution to all the problems, still it is considered better when compared to overflowing land fills.

System of waste minimization was introduced in USA in 1985. The goal is prevention of waste (or) reduction of the toxicity of wastes before they are sent to landfills in order to protect the human health and the environment. They have (USA) three waste minimization regulations which are in practice. Other ways by which solid wastes can be disposed off includes improved control over solid waste disposal practices and better resource recovery as well as utilization of conservation techniques whenever possible.

Of the hazardous wastes, the disposition of radioactive wastes poses danger to the human community. The radioactive waste poses two major problems. First, radioactive wastes have some potential for use in the manufacture of nuclear weapons. Second, radioactive wastes are different in kind from other hazardous substances. The fission process emits so much of radioactive materials which is capable of destroying life. It is unfortunate, that knowing the dangers of radioactive wastes, some countries are experimenting in the field of nuclear energy. What is required is that they should be permanently prevented from entering the environment. Problems associated with solid and hazardous waste is plummeting to such an extent that Governmental involvement in this area has become necessary and more
WATER POLLUTION:

Just like air pollution, water pollution is also dangerous to life. Preventing pollution and purifying polluted water has become a Global concern. Almost 85 percent of the rain falls directly into the sea, the remaining percentage has been utilised by human sector, industrial sector and agricultural sector. They in turn discharge their filth and harmful wastes into the sink thereby causing pollution.

These three sectors use water mainly for drinking, cooking and food processing, bathing, swimming and recreation, growth, propagation of fish, shellfish and other aquatic life and watering, irrigation, cooling and industrial process. For almost all activities, water is needed. Supply of clean water and of adequate quantity is essential for the promotion of healthy environment. The term “Pollution” is employed when wastes from human and natural activities flow into a water system in such quantities that the natural capacity of the system to cleanse itself is either reduced (or) destroyed. Water pollution occurs either due to point (or) due to nonpoint sources. Nonpoint pollution sources are sedimentation, pesticides, organic agricultural wastes and fertilizers. It is therefore difficult to measure and control.

Normally, self-cleansing water system uses oxygen to breakdown organic pollutants into harmless (or) inoffensive forms. When too-much waste enters a water system, however, the natural purification process breaks down. The consequence is polluted water unsuitable for a variety of functions.

The National Water Commission (1973)\textsuperscript{23} stated that pollution is caused by

- Bacteria, viruses and other organisms that can cause disease (e.g) cholera, typhoid, fever and dysentry

- Inorganic salts that cannot be removed by any simple conventional treatment process, making the water less suitable for drinking, irrigation and industries
Plant nutrients such as potash, phosphates and nitrates which while largely inorganic salts, have the added effect of increasing weed growth, promoting algal blossoms and producing organic matter by photo synthesis which may settle at the bottom of the lake.

Specific toxic agents, ranging from metal salts to complex synthetic chemicals.

Waste heat that may render the river less suitable for certain purposes.

Silt that may enter a river in large quantities will affect the character of the river bed

Radioactive substances, etc.

For all these occurrences, the major pollution sources are human settlements, industries, local administrative organisations and air pollution. To find out the degree of pollution that have occurred in the water and also to protect the human health, the quality of the water has to be determined. Water quality standards are based on three elements: uses of each stretch of interstate (or) coastal water, the amounts of various kinds of pollutants allowed in these waters and remedial measures needed to control (or) prevent pollution.24

The Process of determining appropriate water quality standards is however complicated. The practical difficulty arises due to:

Insufficient incentive provided to both public and private institutions to take into account the consequences of their actions that affect water quality.

Separation of planning from operating responsibilities with consequent lack of follow-up.

Inappropriate agency, jurisdictional authority, responsibility and resources;
Weak mechanism for enforcement of water quality standards;

Lack of integration of water quality standards into comprehensive environmental programmes.  

As far as ground water is concerned, pollution arises due to toxic contamination which occurs underneath a water table in rocks, soils etc. While controlling water pollution that arises from point sources is relatively effective, there has been problem with regard to controlling of water pollution that arises due to non-point-sources (that is farms, logging operations, fertilizers, pesticides, mining etc)

Controlling and preventing water pollution is therefore highly technical. Problems arise in the formulation and implementation of legislations. Comprehensive legislation that incorporates the relationship between water quality and water quantity is missing. Normally water supply projects are managed separately from water quality projects. The various organisation that are charged with water management have overlapping and often conflicting functions.

Water pollution control efforts lack proper definition, direction and effectiveness. Many water problems result from lack of co-ordination among programmes at all levels of Governments. Many agencies operate in relation to its own policy, budget, values and vested interest. Conflicting water quality standard is another factor which is responsible for ineffective water management. Economic priorities come into conflict with environmental and public health priorities.

As far as controlling of water pollution is concerned, the legislative approach is to be "Speculative and Futuristic" instead of incremental and current. Finally, effective pollution control depends upon the extent to which citizens are willing to pay attention to hygiene and alter their life-styles in order to reduce the risks.
NOISE - POLLUTION:

Noise is again another pollutant which not only affects the environment but affects the quality of life of the people. Conceptually noise is a sound of unwanted, obnoxious and disturbing nature that has no redeeming value. Encyclopaedia Americana defines "noise as unwanted sound". What is pleasant to some ears may be extremely unpleasant to others. In other words, any sound may be noise of circumstances. In acoustics noise is defined as undesired sound.

Several factors are responsible for causing noise pollution. But only two major categories have been regarded as sources of noise pollution. They are Industrial and non-industrial. The industrial may include noises from various industries like transportation, vehicular movements such as car, motor, train, motorcycle, aircrafts, rockets etc. Among the non-industrial sources, important ones are the street noise due to hawkers, use of loudspeakers, thunder, etc. However, the list is not exhaustive. One of the most serious noise pollution problem is associated with aircraft's noise specifically around airports.

Noise effect on living and non-living is both psychological and physiological. One of the most serious consequences of exposure to excessive noise is its adverse effect on hearing. It has been revealed, that steady exposure to approximately 84 (or) more decibels can cause permanent hearing loss. Increasing evidence points to other physical and mental illnesses, particularly associated with stress, resulting from noise pollution. In addition to human physiological and mental problems caused by excessive noise, there is some evidence that noise / shock - waves can actually cause physical and structural damage to buildings and homes.

Although noise regulation traditionally has been the responsibility of State and Local Governments, these Governments have experienced great difficulty in establishing
and enforcing regulations for reducing avoidable and damaging noise. Several European
countries have noise abatement strategies. These countries regulate noise emissions
from the source for a greater number of products.

The scientific community has already accumulated considerable knowledge
concerning noise, its effects, its abatement and control. Romans were, perhaps, the
first, to enact a law prohibiting noise by a popular decree, “chariots were banned from
the streets at nights”. At the international level also efforts have been initiated to
standardise noise emission limits so that new products will not produce noise problems.
According to the United Nations environmental protection, noise abatement efforts occur
globally.

“Provisions for preventing and compensating for occupational deafness have been
made in many countries. Some countries have established permissible noise exposure
levels for workers”. Others have also adopted regulations to control minimum permissible
noise levels for workers. The WHO has recommended 85 decibels as the standard level
of hearing.

Many countries have enacted specific legislations to control noise pollution. For
instance, England, America etc. They have adopted measures and control noise are:
noise control at source and proper planning of new cities (thereby the industrial
sites will be away from the residential areas) etc.

So, what is warranted is a uniform law for controlling noise pollution so that the
society will be freed from this hazard. Formulation of “Noise Free Zones” around all
schools, colleges, hospitals, telephone exchanges, etc. is the easiest and cheapest
way to control noise pollution. Also Noise Abatement Zones should be formed where
noise pollution is very high in order to reduce it to the optimal minimum. The preceding
paragraphs reveal that many factors are responsible for different kinds of environmental
pollution. Therefore, planning and framing policy towards environment becomes a complex process.

**ENVIRONMENTAL PLANNING AND POLICY:**

Any policy making body, while framing policy for the environmental protection / conservation of natural resource must take into account

- The physical feature of the urban area with regard to environment;
- The trend of pollution in urban areas.
- The Inner city i.e. older town of the city,
- The sub-urban sprawl etc.

Urban areas are normally fragmented and have deeply affected ecosystem. However, the human, technical - scientific and industrial resources operate according to the principles of "ENVIRONMENTAL UNITY". That is all elements of the urban environment are interrelated and interdependent. This implies that if any change occurs in any one of the element, it will have its impact over others.

Therefore, the objective of any environmental policy need to be integrated and related to various sectors such as housing, economic development, tourism, cattle farming, etc. Dennis McEbrath has identified two major obstacles to the development of effective urban environmental policy: the absence of an integrated concept of public responsibility for environmental concerns and the existence of a political structure that impedes comprehension of policy issues in meaningful terms.

Another aspect connected with environmental pollution is that it occurs initially in the "Inner-city" of the urban area. The "Inner city" constitutes the decaying, aging urban area, interwoven within the central city as well as with surrounding sections of the city.
sharing the same environmental characteristics. Those living in the concentrated inner-city experience a wide range of environmental problems, some apparent and some hidden but most of them characterised by severity.

The Inner city experiences more of air, water, noise pollution, congestion, lack of open space and deteriorating living space than any where else. This in turn affects the other places which are around the Inner city but within urban area. Not only the "Inner city" is faced with environmental problems, even the residents especially the urban poor are affected by inadequate housing, poor health, unsanitary conditions etc. That is the urban poor's environmental concerns are highly intertwined with their Inner city experience.

Another environmental aspect of the urban areas is that Inner city problems cannot be treated in isolation from a larger environmental context. The targeted approaches in fact neglect many essential environmental considerations.

As far as sub urban areas are concerned, they were once compact, attractive and less polluted. Now the scenario has changed due to sub urban sprawl, not only these areas have become densely populated, they are even affected by pollution. The Council on Environmental Quality (CEQ) suggests that combination of open space with cluster zoning (or) planned unit development makes a more livable environment.

This environmental problem can be reduced by making effective policy for which there are several approaches. Varshney, C.K. says that there are wide range of policy choices available to protect and improve environment. He stresses, a judicious blend of short term and long term policies which will integrate environmental and developmental activities so that sustainable development can be achieved. In short-term policies, the most effective means of reducing emissions is through strategy that rely on economic instruments such as pricing, tax concessions, subsidies and direct regulatory control towards environmental degradation.
In the long-term policies, promotion of research, development and education regarding nuclear technology, clean products etc. will help in the restoration of ecosystem. It has been felt that economic policy and industrial policy must include some provisions regarding environment. In fact, liberal fiscal and industrial policies have to be integrated and implemented in such a manner that without restricting the freedom of industry and entrepreneurs, environmental conservation is to be ensured. A pragmatic environmental policy should emphasize preventative measures instead of relying on curative approaches.

For any policy formulation, sustainable development should be the basic principle. Sustainable development is insisted, for it performs the following major tasks:

- Stabilises the population growth.
- Integrates the land use and water management.
- Conserves the biological diversity.
- Sustains the energy and resource utilisation.
- Controls the pollution.
- Improves the human habitats.

The main objectives of sustainable development stated to be “environmental harmony”, economic efficiency, equity with social justice, both intra and inter-generational, conservation of resources and local self-reliance. These objectives could be achieved only if the environmental dimension is added to the entire process of national development and the development plan of all sectors are consistent with the concept of “sustainable development”

While sustainable development should be the basic principle behind environmental policy, Charles Lindblom provides how the environmental problem should be approached.
He writes, in policy making, incrementalism is favoured by public officials. “Policy making is part of the political process in which the only feasible political change is that which changes social status by relatively small steps” says Charles A. Lindblom. Decision-maker typically considers among all the alternatives, policies that might he imagined to consider only those relatively few alternatives that represent small (or) incremental changes from existing policies.

Incrementalism relies more on “past experiences” as a guide for new policies. It permits policy-makers to draw upon their own experience in the face of unfamiliar problems and encourages the making of small policy adjustments “at the margins to reduce anticipated, perhaps irreversible and politically risky consequences. But incrementalism can also become a prison to the imagination.

ENVIRONMENTAL POLICY OF GOVERNMENT OF INDIA:

Till the end of the 80s, the environmental problems were viewed sectorally. Later on, the environmental issue has been viewed seriously and significantly both by the developed and by the developing nations (India is not an exception). The policy framed by the Government are highly fragmented and inadequate whereas environment represents an Integrated whole. The following illustration justifies this statement. The taxation philosophy of our country is to levy tax on accumulation of wealth (or) generation of wealth and has nothing to do with consumption of environmental resources which is a natural capital and represents a common property resource.

Environmentalists have stressed that the taxation should be levied in proportion to the damage inflicted to the environment by an individual, industry (or) by any other human endeavour.

For abatement of pollution, the Government of India framed the environmental policy with the following objectives in 1992.
Prevention of pollution at the source itself.

Encourage, develop and apply the best available, practicable technical solutions;

Ensure that the polluter pays for the pollution and control arrangements

Focus protection on heavily polluted areas and river sketches and

Involve the public in decision-making.

The whole idea behind the inclusion of these objectives is to integrate environmental considerations into decision making at all levels. The fragmented effort of the Government of India towards environmental protection is seen from the various sectoral policies in which there are provisions for environmental protection.

NATIONAL HOUSING POLICY (1988):

Though the policy accords priority to “SHELTER” for the houseless, disadvantaged groups and EWS, for the protection of environment, the following measures had been outlined in the policy.

In the planning of human settlements, care will be taken to preserve as far as possible, special natural features and historical monuments and integrate them into the environment of such settlement by suitable landscape planning.

Necessary administrative and legal measures will be taken for ensuring a healthy environment in human settlements; planting of trees by individuals and their associations will be promoted.

House designs and layouts will be reoriented to make maximum use of alternative sources of energy such as solar energy bio-gas etc.

The maintenance of purity and reliability of sources of drinking water and the installation of efficient wastes disposal system and their proper maintenance will be given priority.
Special care will be taken to locate hazardous industries at a safe distance from human settlements.

NATIONAL WATER POLICY (1987):

Recognising water as a natural resource, the policy stressed that planning and development of water resources would be governed by national perspectives.

On the environment side, the policy stressed the following:

- In the planning, implementation, and operation of projects, the preservation of the quality of environment and the ecological balance should be a primary consideration.

- There should be an integrated and multi-disciplinary approach to planning, formulation, clearance and implementation of projects including catchment, treatment, environmental and ecological aspects, the rehabilitation of affected people and common area development.

THE NATIONAL LAND USE POLICY (1988):

In order to meet the consumption needs of the land resource stressed the need to increase productivity of the integrated land resource in the country. At the same time it also recommended that town planning should provide adequate space for green belts so as to reduce congestion and pollution of environment.

The policy indicated that environmental protection cannot be succeeded unless there are heavy penalties imposed on anyone who interferes with the land resources and its productivity.
Industries, one of the pollutants of air, water, noise etc do have taken care of environment. This is revealed by the Industrial Policy of the Government which, though provided guidelines for economic development, also provided guidelines for the conservation of the natural resource. The main thrust in the context of environment protection and conservation is given below:

The Government in order to control pollution announced that industries which directly (or) indirectly contribute to improve environment would be made eligible for special assistance on appropriate terms. In order to encourage the dispersal of industry, steps were taken to prevent the growth of industry in metropolitan cities and the large towns. Setting up of new industrial undertaking within the limits of such urban centres are denied permission.

ENVIRONMENTAL POLICY OF TAMIL NADU:

While the National policy is highly fragmented and lacks comprehensiveness, in the following pages, matters such as the nature of the policy at the state level, the measures taken by the Government towards the protection of MMA from environmental points of view are discussed. Before going into the matter, the environmental situation of MMA is provided in the following few pages.

MADRAS METROPOLITAN AREA:

Being a commercial, administrative and industrial centre, it is also a polluted area. Besides air, water and industrial pollutions, the poor storm water drainage system, and the irresponsible attitude of the public towards the disposal of solid wastes have made MMA still more, polluted. The Tamil Nadu Pollution Control Board takes necessary steps towards air, water and industrial pollution. The Madras Corporation is involved in solid waste disposal, and storm water drainage.
SOLID WASTE DISPOSAL:

In addition to the human population, animals including cattle and buffaloes add to the solid waste. The Madras Corporation by installing concrete bins in all streets help the public to dump the solid wastes. By routine trips, the solid wastes are collected and conveyed it to three dumping sites which are situated at Korukkpeta, Saidapet and Otteri. Of the three, the site at Korukkpeta is the largest. By two ways solid wastes are disposed, by manufacturing compost which is used for manuring agricultural lands and by reclaiming low lying areas by filling the lands.

However, there are problems in land filling method.

- The present method of collecting solid waste at the sides of the roads, streets and at spots near industrial establishments create problems of environmental sanitation. Since the refuse is conveyed on open lorries / carts, it pollutes the environment.

- Disposal by land filling causes problems of pollution and water logging in the surrounding areas.

- Substantial quantities of dung and waste material from cattle sheds are being dumped into the city's sewers which, in turn, is causing blockade of sewage system.

STORM WATER DRAINAGE:

The Storm Water Drainage System is constructed and maintained by the Madras Corporation. The storm water drainage is normally constructed on an adhoc basis in response to individual problems.
The MMA is prone to storms and cyclones because the city and its environs is very flat. As a result, during heavy rainfall, many parts of MMA is flooded with rain water. This causes stagnation in certain low lying areas and the draining of this storm water becomes difficult. There are several reasons for this state of affairs.

- Large areas of open fields which used to observe water have now become built up area.
- The rivers and canals which carry these flood water into the sea do not have adequate capacity due to silting.
- A number of irrigation tanks which formerly also acted as flood moderators were taken over for urban development.

Several proposals were made to have effective storm water drainage system right from 1943 onwards. However, all those proposals were not implemented due to several reasons. A consultant to the World Bank, J.H. Kog after studying the problems of flooding suggested programmes of immediate action and long term planning for the present and future drainage and flood protection situation in MMA. The proposals of the immediate programme and the map showing the storm water drain zones are provided in Annexures 41 & 42.

A task force was constituted to examine the possibility of implementing the short term measures recommended and also to prepare detailed proposals to carry out the long term plans. Under these situations, what has been the aim of the Government towards environment protection? What are the programmes that were introduced to fulfill the objectives of the environmental policy are given in the following pages. The environment policy is formulated by the Department of Forest and Environment Control which was established in the year 1982 as an independent department. The Department is headed by a Secretary who is assisted by a Joint Secretary and other secretariat
staffs. The policies that were prepared by this department between 1980 - 1995 have been divided into three periods between 1980 - 1985, 1985-1990 and between 1990-1995.

**BETWEEN 1980 - 1985:**

During this period the policy of the Government was mainly to protect the public health. So, in order to achieve this, efforts were taken to minimize air and water pollution with the help of the Directorate of Public Health and Preventive Medicine.

The Directorate acted as a monitor and took action effectively towards effluent industries such as tanneries, distilleries, fertilizer units etc. In fact the Government made it mandatory to obtain health clearance from the Directorate by Industries, whose wastes were of highly pollutational in character (before putting up their plants).

The Directorate, before granting health clearance, took into consideration the various factors such as nature of trade location, quantity and quality of water in conformity to ISI standards, and stipulated suitable conditions for strict adherence. Anticipating the impact of rapid industrialization over the eco-system, the Directorate was also entrusted with the objective of protecting the environment by prevention and control of pollution. In order to facilitate the objective, the Tamil Nadu Government passed the Water (prevention and control of pollution), Act 1974 which is a central act. The awareness towards Environmental protection was felt all over. The result being the establishment of the Department of Environment Control in the year 1983.

Several proposals were made towards overall protection of the environment. They are

- Establishment of laboratory at Madras for the analysis of samples of air and water that were collected from the industrial areas and rivers and also samples of sewage and trade effluent collected from industries.
Survey of the quality of water throughout the state and to demarcate different water type zones with reference to the quality of water. This work was entrusted to the Tamil Nadu Pollution Control Board. The board was asked to send proposals to the Government suggesting the types of industries that can be encouraged in different water type zones with reference to their nature.

There was a proposal to constitute a committee to go into the question of disposal of sewage and solid waste by local bodies into rivers and to suggest proper treatment and disposal measures to control river water pollution.

BETWEEN 1985 - 1990:

During the period the policy decision of the Government continued to be the same. However, efforts were taken and programmes were introduced in several areas where it was thought necessary to protect and preserve the environment. Several committees were also constituted to deal with this matter. Between 1987 - 88, besides clearing of North Madras Thermal power project proposed by the Tamil Nadu Electricity Board, Tuticorin thermal Power station and Neyveli second thermal power station stage II and III, several other projects were cleared by the environmental committees. The list of the projects are given in Annexure -43.

To find out areas that are prone to pollution, an Environmental Research Unit was started in addition to Air Quality Monitoring Station which was started mainly to control air pollution caused by the automobiles. The other programmes that were started / proposed and also other preventive measures that were taken during 1985 - 1990 are given below:

The board has laid down standards for effluent discharged into water bodies (or) on land. While issuing consent to industries, the board has stipulated necessary conditions for bringing trade effluent to the standards that has been fixed by it.
As regards air quality the board has laid down Ambient Air - Quality Standards for the entire state. The Board has also laid down the emission standards for Cement factories, Thermal power station etc.

To encourage research on environmental impact on several fields, the Government of Tamil Nadu had asked the Government of India for financial assistance. One such area that was recommended by the State Government was Coastal Water Monitoring project.

The Government of India had sanctioned money for the setting up of a Technical cell to give technical advice.

Manali is an industrial area where there is a concentration of fumes which has an impact over air - quality. It was therefore planned to have Air-Quality Monitoring Station at Manali.

The environmental committee further cleared two projects in 1987 - 88. In the Environment Control Department, a Technical cell was created to function as a co-ordinating agency for looking after various aspects of environment management, as a component element of the state environmental programmes.

For the first time to protect Madras City from environmental problems, actions were taken towards rivers and canals that are passing through Madras City. The Cooum, Adyar river, the Buckingham canal and Otteri-nulla pass through Madras City. For various reasons, the quality of these water resources has been delineated. A task force has been constituted with the Chief Secretary as its chairman, to co-ordinate the activities of the various organisations involved in the improvement of these water sources.

The representatives of the Royal Danish Mission (DANIDA) visited Madras in 1988 expressed their readiness to render consultancy assistance. The proposals that were posed to DANIDA through Government of India were mostly oriented towards solid and hazardous wastes that are emitted from industries.
BETWEEN 1990 - 1995:

Though the Government continued with the programmes that were initiated during 1985 - 1990, towards the end of 95, the orientation of the policy was towards sustainable development. It was felt that for the survival and well being of a nation, sustainable development is a must. That is development at the social and economic level for the present generation without affecting the interest of the future generation. To achieve this objective, it is believed that care is to be taken to maintain the environment from which we derive sustenance level that does not exceed its carrying capacity for the present as well as for the future. The need for environmental protection is therefore an integral component of sustainable development of the country. Realising this, the Government in its policy note on Ecology and Environment have included the following features:

- It has been recognised that for a sustainable development, environmental protection constitutes an important integral part of the development process and cannot be considered in isolation.

- Orientation has been towards reduction and elimination of unsustainable pattern of production and consumption as well as promotion of appropriate demographic policies;

- An appropriate policy to prevent and control deterioration of land, water and air which constitute life support systems.

- It has been decided to prevent further damage to natural and man-made heritage and their maximum conservation.

- The principle that the "polluter should pay" is one of the basic tenets of the policy.

- The policy ensures that development projects are correctly cited so as to minimize their adverse environmental consequences.
Environmental safeguards and protection measures in policies, planning, site selection, choice of technology and implementation of various development projects in various sectors have been incorporated in the policy.

Research and development are encouraged.

The policy paves way for effective implementation of various environmental laws and regulations for environmental protection through creation and strengthening of the requisite enforcement machinery.

The strategy adopted to implement the above objectives are population control and family welfare, integrated land and water management aiming at their sustainable uses, effective prevention and control of water and atmosphere pollution including noise pollution, conservation of bio-diversity, increasing bio-mass production and formulation of sustainable action plan in various sectors.

The various programmes that are initiated to achieve the above mentioned objectives are given below.

Creation of the Department of Environment:

To ensure an exclusive attention on better environmental management and to draw up a realistic plan of action, the Government proposed to create a Department of Environment. This department will deal with all the aspects of environmental management other than those dealt with by Tamil Nadu Pollution Control Board and Forest Department. It has been decided to have this department as a multidisciplinary organisation with the administrative control by the Department of Environment and Forests of the Government.
Applied Research and Development Cell:

To undertake the adoptive research work on environment, this cell has been proposed. The cell will identify the process that causes problems of waste disposal and will help in modifying the process to reduce pollution load.

Ozone Monitoring Cell:

To fulfill India's commitment to Montreal Protocol, it has been decided to establish an ozone monitoring cell which will examine the scope for application of substitutes which would not affect the ozone layers. It is expected that this programme will help in finding out the substitute of ozone depleting substance by environmentally friendly compound. All the above mentioned projects are going to be funded either by the Government of India (or) by the Government of Tamil Nadu.

EXTERNALLY AIDED PROJECTS:

In order to meet the expanding needs of environmental management and also to avail the benefits of technological advances in this sphere, the Government is keen to get both financial and technical assistance from external organisations. The Government has sought the external assistance for some of such schemes as.

Environmental Training Institute:

For Human Resource Development in environmental management, Environmental Training Institute is being set up with the assistance of Royal Danish Mission (DANIDA).

Abatement of Pollution in the Coastal Stretches of Madras City:

For improving city water ways aiming at improvement of general sanitation, removal, transportation and disposal of sludge in the water ways, management of
industrial effluents and hazardous wastes, besides river side afforestation and institutional strengthening has been presented to the European Community for external assistance. Besides these, there are several ongoing programmes which are aimed at making the place pollution free.

IMPLEMENTING AGENCY:

All the above mentioned programmes are implemented mostly by the Tamil Nadu pollution control board with the help of many committees and also by enforcing the provision of several acts.

TAMIL NADU POLLUTION CONTROL BOARD:

The Parliament enacted the Water (prevention and control of pollution), Act 1974 (central Act 6 of 1974) to control water pollution and formed the central board for the prevention and control of water pollution at New Delhi. Many states have adopted this Act and formed State Board to tackle problems of water pollution. This came into force in the State of Tamil Nadu with effect from 31st August 1981 and the Government of Tamil Nadu constituted the Tamil Nadu prevention and Control of Water Pollution Board with effect from 27.2.1982. The board has since been remained as Tamil Nadu Pollution Control Board.

AMBIENT AIR QUALITY MONITORING:

With the increased industrial activity in the vicinity of major cities, the need for keeping the ambient air quality within the limits prescribed by the board is being increasingly felt. Therefore nine Ambient Air Quality Monitoring Stations have been established in Madras, Coimbatore and Tuticorin so as to monitor the level of air pollution in ambient air and to take necessary follow up action.
VEHICLE EMISSION MONITORING:

The board has been testing the goods transport vehicles from 1992 onwards for their emissions and for this purposes, there are four monitoring stations functioning in Madras metro itself. It has been decided to include all classes of vehicles in Madras City. Proposal has also been made to cover all vehicles in Chengalpattu MGR, Nilgiris and Dindigul Anna Districts. The normal procedure involved in this connection is that vehicles are issued with fitness certificate by the Transport Department only on production of the test certificate of Pollution Control Board. The number of vehicles tested for emission standards has increased from 12,089 in 1992 to 15,824 in 94 - 95 (i.e. upto 28 2 1995).

MONITORING OF INDUSTRIAL POLLUTION:

The increasing number of industries necessitate the board to monitor industrial pollution. The following steps are taken by the board to continuously monitor the industrial pollution so as to keep it under control.

(i) High Level Officers of the grade of Joint Chief Environmental Engineers personally inspect all the Red category industries before issue of consent.

(ii) A Special monitoring cell has been set up in Madras to monitor highly polluting industries. As an enforcing agency the board has powers to take action against industries which do not comply with the conditions stipulated by the board and to issue direction to close the industry under the Water and Air Acts. The board has filed 320 cases under Water Act and 134 cases under Air Act against industries for contravention. The board has also issued notices to industries for closure as they have not complied with the conditions laid down by the board in the consent order.
V MANAGEMENT OF COASTAL ENVIRONMENT:

Tamil Nadu has 1000 kms long coast line, which has to be protected from over exploitation. Taking into consideration the features of ecologically sensitive areas, developed areas and relatively undisturbed areas, the coastal stretch has been classified as Coastal Regulation Zone I, Coastal Regulation Zone II and Coastal Regulation Zone III restricting certain activities in these areas. A coastal Zone Management Plan for Tamil Nadu has also been prepared and sent to Government of India for approval.

THE TAMIL NADU STATE ENVIRONMENTAL COMMITTEE:

The Tamil Nadu State Environment Board constituted by the Government in 1976 has since been renamed as Tamil Nadu Environmental committee. It continues to function as the apex advisory body in the matter of protection of environment in the State Development project costing over Rs 50 lakhs have to be referred to the committee for review and clearance from the environmental point of view. The Chief Minister is the Chairman of the committee. The Member Secretary of the Tamil Nadu Pollution Control Board is the Member Secretary of the Tamil Nadu State Environmental Committee also. The Committee has cleared several projects which are already mentioned in Annexure-43.

COMMITTEE ON CONSERVATION OF SEA-SHORES:

The sandy area of 500 meter width is an important interface between sea and land. Unless we regulate the activities in this area, there is a risk of marine pollution, which may affect the fish and other aquatic life and eventually hurt human beings also. Therefore a committee has been constituted with the Chief Secretary as the Chairman.
This committee has been constituted mainly to regulate projects coming within 500 meters of the high water mark.

AIRFIELD ENVIRONMENT MANAGEMENT COMMITTEE:

The necessity for air travel in modern days also requires safe and comfortable journey. One problem faced in the vicinity of airports is "birds striking" the aircraft. This problem arises due to environmental pollution which attracts the birds viz slums, markets, eating places and butcheries (or) injudicious dumping of garbage, open sewage etc in and around the airfields. This bird striking can cause major accident upto considerable expenditure to the organisation. To eliminate this risk, airfield management committee has been constituted. The committee collects information and identifies the sources of bird attraction in the vicinity of airports and suggests suitable measures to minimize the hazard.

JOINT STANDING COMMITTEE:

In order to solve the problem of small scale industries, a committee has been formed with the members of the board and the representatives of small scale industries. The chairman of the board is the chairman of this committee. The secretary of small scale industries association is the secretary of this committee. The committee meets once in three months to discuss the issues related to the problems faced by small scale industries in implementing pollution control laws and suggest suitable solutions.

The programmes that were implemented by the pollution board with the help of the committees, were meant not only for MMA but also for the whole of Tamil Nadu. In addition, the board also looks into the city water ways. Over the past three decades the waterways in Madras viz Cooum, Adyar, Otteri-nullah and Buckingham canal have become increasingly polluted which required remedial action. With the general objectives
of environmental improvement of Madras City water ways, a collaborative work has been carried out by the board along with Severn Trend International of United Kingdom under assistance from Overseas Development Agency. As per the report prepared by Severn Trend International, MMWSSB have to upgrade the sewerage system and sewage treatment plant.

Also as per decision taken at the meeting convened by the Secretary to Government, Finance Department regarding the improvement of Madras City water ways, the board has formulated and sent the project proposals on Industrial effluent and hazardous wastes management covering common marine outfall for Manali, Ennore Industrial complexes, common effluent treatment plant facilities for electroplating works and monitoring programmes for city water ways

CONCLUSION:

As Mr. P. J. Kunan said, “Neither global war nor epidemics threaten the future of mankind. It is ecological devastation being wrought by an industrial and consumer oriented society which is plunging the earth into a disaster” 47 This puts extra pressure on the Government to preserve the Environment.

As mentioned already, the constitution of India has given the responsibility of “improving the public health, raising the level of nutrition and the standard of living of the people and to safeguard forests and wild life of the country” to the states.

As a social servant of the public, the Government has in many ways worked out the possibilities for pollution free environment. This can be proved from the efforts it has taken towards environment and the various programmes it has implemented towards pollution free environment. However, there are certain aspects which need attention
FINDINGS:

Tamil Nadu, as far as environment is concerned, is enforcing only Central Acts. In the area of noise pollution, there is no law exclusively dealing with the problems of noise. (Though under the state list and concurrent list, the state Government has legislative power regarding environment).

There is no comprehensive policy which includes all aspects of environment. For instance, the policies have provision for controlling air and water pollution but nothing towards controlling noise pollution. Also steps towards solid water disposal and storm water drainage are not included in the policy of the Government Notice.

There are several organisations involved in environmental protection. While the Pollution control board is entrusted with programmes in air and water pollution, the Madras Corporation is entrusted with the responsibility of disposing solid wastes and maintaining storm water drainage system.

There is no single administrative organisation to deal exclusively with the environmental problems of MMA.

SUGGESTIONS:

Unless there is a comprehensive and integrated policy towards environment, making MMA a “Pollution Free” area will be a difficult task.

An effective land use planning can reduce pollution in many areas. That is land use plan must take potential economic development and population growth into account.
If the state feels that it is overburdened with responsibility, it can always encourage the private parties and entrust the responsibility to the private and voluntary organisations to keep MMA clean.

There are two broad categories of environmental pollution: those arising from conditions of poverty and under development and those arising as negative effects of the very process of economic development. While the Government policy has taken initiative to prevent pollution due to industries, no effort has been taken in the area of slums.

Insufficient finance is also one of the reasons for poor maintenance of MMA. To improve the revenue, the local Governments can collect maintenance charge from the public for cleaning the area (just like collecting tax for drinking water).

Finally, the legislature by enacting laws that suit to the situation, the executive by effectively implementing the legislations and the judiciary by acting vigilantly towards legislature, and citizens by realising the fact that the surroundings belong to them, probably can maintain a better and pollution free environment. What is required is a total consensus efforts by all.

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NOTES AND REFERENCES


3. Ibid., p.6


8. Ibid., p.138

9. Ibid., p.157


15. Ibid
If one raw material causes a pollution problem while a substitute material does not, obviously the substitute would be more desirable.


A selection process should be used that gains and maintains the confidence of a highly concerned public, such a system should:

- Establish clear predictable standards that eliminate from consideration any unfair sites and unsafe disposal methods.

- Objectively and honestly determine facts about each potential site in a way that permits everyone affected to be heard.

- Entrust the decision of selecting the site to the constituency rather than to the neighbour.

- Whether the site is selected, compensate neighbours for the burdens that they are bearing for the common good. The compensation may be directly in the form of cash or indirectly in the form of community improvements.

Companies that generate hazardous wastes and ship them off the site of generation must certify on each manifest that the company has a waste minimization programme in place.

Companies that manage the waste of others or that generate waste and manage it themselves on their site of generation must annually certify that they have a waste minimization programme in place. This certification is maintained on company property.

All hazardous waste generators are subject to RCRA biennial reporting requirements. Companies that generate hazardous wastes and ship them off the site of generation are subject to a special waste minimization section in the biennial reporting requirements. They must describe waste minimization efforts undertaken during the year and report any changes actually achieved in the volume and toxicity of wastes.


Ibid., p.213.


Ibid

Ibid., pp. 240 - 241.

*Noise Abatement Act, 1950 (England), Noise Pollution and Abatement Act, 1970 (U S A.)*


Ibid , 104

*One of the American Organisations which is concerned with the preservation of Environment and Control of Pollution*


Ibid ,

Ibid , p 19

Ibid ,


Walter A. Rosenbaum, *Op cit.*, p.73

The Clear Air Act (1970), The Nation Environmental Policy Act, 1970 (both are America Acts); Other innovative Legislation of the early 1970s came only after Congress repeatedly failed in dealing with environmental issues incrementally.


Ibid , p 194.

In 1943, a report was prepared by the then Chief Engineer, PWD, A R. Venkatachali, Madras Corporation Prepared the Master Plan for storm water drainage in the early 1970's, Sivalingam Committee in 1976

Jelly filled Telephone cable project at Arakonam, Heavy Alloy Penetrator Project at Trichy
Environmental improvement of the Cauvery river

Project related to handling and disposal of solid waste

Hazard and Management of Manali Industrial base

Environmental Management of effluent from Textiles, dyeing industries

Establishment of Institute of Environmental Science and Management in Tamil Nadu


G O Ms No. 11, Environment Control Department, Dt 8.3.1984

G O Ms No. 2151, Health and Family Welfare Department, Dt 19.12.1980

Art 42 The State should make provisions for just and human conditions of work

Art - 43 Securing living way is not enough, state should endeavour to ensure decent standards of life

Art - 47 State to raise the level of nutrition and standard of living and to improve public health

Art - 48 A State shall endeavours to protect and improve the environment and to safeguard the forests and wild life of the country

Art - 51 A It is the fundamental duty of every citizen of India to protect and improve the national environment (whereas under Art - 21, it is said that every person can claim the right against pollution but the duty is only of the citizens
