LIABILITY OF MULTINATIONAL CORPORATIONS FOR ENVIRONMENTAL POLLUTION IN INDIA: A STUDY

ABSTRACT
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Abstract

Chapter 1: INTRODUCTION

A legal definition of the environment helps delineate the scope of the subject, determine the application of legal rules, and establish the extent of liability when harm occurs. The word environment is derived from an ancient French word environner, meaning to encircle. By broadly applying to surroundings, environment can include the aggregate of natural, social and cultural conditions that influence the life of an individual or community. Thus, environmental problems can be deemed to include such problems as traffic congestion, crime, and noise. Geographically, environment can refer to a limited area or encompass the entire planet, including the atmosphere and stratosphere. Given the potential breadth of the field, in some circumstances law and policy will respond to environmental deterioration produced by natural events, such as volcanic eruptions, as well as those caused by human intervention. Even though law cannot affect the natural processes causing environmental changes, it can and does regulate human behaviour, including behaviour in response to natural disasters. Overall, broad definitions and the fact that all human activities have an impact on the environment make it difficult to establish the limits of environmental law as an independent legal field; indeed they imply the integration of environmental protection into all areas of law and policy.

In Rio, NGO’s activity split into two tracks. At the official conference there were more than 1400 NGOs accredited. The other NGOs were held at the separate Global forum. The two most significant activities taking place under the forum umbrella were a series of technical, scientific and policy meetings held at 50 sites around the city and an ambitious
exercise in paroled treaty writing syndicated by an international network of NGOs and Social Movements. NGOs both UNCED and the Global Forum produced an enormous volume of information, too vast to catalogue. Following is a list of treaties that were completed in the global Forum:

(a) Earth Charter;
(b) NGOs Cooperation and Institution Building Cluster;
(c) Alternative Economic Issues Cluster;
Food Production Cluster; and Cross Sectional Issues Cluster.

Chapter-2 PROBLEMS OF ENVIRONMENTAL POLLUTION: INDIAN SCENARIO

India adopted the socialist pattern of society in 1954 as a framework for social and economic policies. This framework articulates that public policy decisions must enable the society to maximise social gain and not private profit. This framework also envisages a catalytic role for the State in the social and economic transformation of the country. The Constitution of India provides a number of Directive Principles of State Policy. Indian Five year Plans have also stressed goals such as rapid economic growth, employment generation, poverty alleviation and balanced regional development. Since June 1991 there has been a tilt in economic policy towards economic liberalisation and globalisation. The importance of sustainable development is also being stressed as an objective of public policy.

Environmental problems stem from two main categories of human activities:

1) Use of resources at unsustainable levels, and
2) Contamination of the environment through pollution and waste at levels beyond the capacity of the environment to absorb them or render them harmless.

Resulting ecological damage seen around the world includes:

- Biodiversity loss
- Pollution of water and consequent public health problems
- Air pollution and resulting increase in respiratory diseases, deterioration of buildings and monuments
- Loss of soil fertility, desertification and famine
- Depletion of fishing resources
- Increase in skin cancers and eye diseases in certain areas due to ozone depletion
- New diseases and more widespread disease vectors
- Damage to future generations

**The N.D. Tiwari Committee, 1980**

The Government of India set up a Committee in January 1980, under the Chairmanship of N.D. Tiwari, then Deputy Chairman of the Planning Commission, to review the existing environmental legislation and to recommend legislative measures and administrative machinery for environmental protection. This Committee stressed the need for the proper management of the country’s natural resources of land, forest and water in order to conserve the nation’s ecological base. Its major recommendations are:
(a) creation of a comprehensive environmental code to cover all types of pollution and environmental degradation;

(b) constitution of environment courts in all District Head Quarters, and the appointment of experts to assist the Court;

(c) creation of a Department of Environment;

(d) setting up of a Central Land Commission;

(e) provision of economic incentives to industries to encourage environment friendly products, income tax and sales tax benefits for adopting clean technology, investment tax credits for purchases of purification devices, inclusion of replacement cost of purification equipment in annual operating costs, and minimal tax or no tax on the manufacture of pollution control devices; and

(f) environmental impact assessment (EIA) not only be a prerequisite for industry to start, but also must be repeated periodically.

**Bhopal Tragedy to the 1998, 1984 to 1998**

Constitutional amendments, legislations and policies relating to environmental protection during this period were influenced by domestic events, shift in economic policy and international events. The Bhopal gas tragedy and the difficulties faced in claiming compensation from the company and disbursing compensations to the victims necessitated the need for a comprehensive environmental legislation, rules relating to storing, handling and use of hazardous wastes and a law to provide immediate compensations to the victims of industrial accidents.
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Since June 1991, the Government of India announced a series of reform measures to liberalise and globalise the Indian economy. An urgent need was felt for decentralisation and debureaucratisation. The amendments to the Constitution in 1994 recognized the three-tier structure of the government and facilitated the transfer of powers and resources to the local governments. The Supreme Court and High Courts have been very active in the enforcement of legislations relating to environmental protection.

The decisions reached at the UN Conference on Environment and Development held at Rio de Janerio in 1992 as well as the shift in economic policy led the Government of India to reexamine the command and control (CAC) type of regulatory regime for environmental protection and to explore the feasibility of combining regulatory instruments along with economic instruments for controlling environmental pollution.

Constitutional Amendments and Public Interest Litigation

The 73rd and 74th Constitutional amendments of 1992 recognized the three-tier structure of the government by devolution of power to the local bodies viz. panchayats in rural areas and municipalities in urban areas. With the passage of bills by the state legislatures and devolving powers and allocating revenue sources, these local bodies can become institutions of self-government. The eleventh schedule contains environmental activities such as soil conservation, water management, social forestry and non-conventional energy, that panchayats can undertake. The twelfth schedule lists activities such as water supply, public health and sanitation, solid waste management and environmental protection.
which the municipalities can undertake. These grass root level institutions can facilitate greater participation by the people in local affairs, promote better planning and implementation of developmental and environmental programmes and be more responsive to the needs of the people.

The Supreme Court and the High Courts have played an active role in the enforcement of constitutional provisions and legislations relating to environmental protection. The fundamental right to life and personal liberty enshrined in Article 21 has been held to include the right to enjoy pollution free air and water. In R.R. Delavoi v. The Indian Overseas Bank case, 1991, the Madras High Court pointed out: ‘Being aware of the limitations of legalism, the Supreme Court in the main and the High Courts to some extent for the last decade and a half did their best to bring law into the service of the poor and downtrodden under the banner of Public Interest Litigation. The range is wide enough to cover from bonded labour to prison conditions and from early trial to environmental protection’. This is a new remedy available to public spirited individuals or societies to go to the court under Article 32 for the enforcement of the fundamental right to life (including clean air and water) contained in Article 21.

Policies

The broad vision of the Ministry with sustainable development as the core underlying theme is enshrined in a number of policy documents, both sector specific and overarching, brought out from time to time. These policy statements provide the conceptual and ideological underpinnings for the regulatory and
institutional framework and the plans and schemes of the Ministry. The important policy statements are:

- National Forest Policy, 1988 - This policy aims to increase the area under forests in the country to 33% through massive afforestation programs and protection of the existing forest cover, regulating management of forest based industries and building on the symbiotic relationship between forests and the forest dwellers.

- National Conservation Strategy and Policy Statement on Environment and Development, 1992 - This policy document laid down a comprehensive agenda of action for protection and conservation of environment by promoting efficient use of water, interception, diversion and treatment of sewage, promoting clean fuels and clean technologies, setting up a chain of national parks, wildlife sanctuaries and biosphere reserves etc.

- Policy Statement on Abatement of Pollution, 1992 - This policy statement focused on implementation, the polluters pay principle, critically polluted areas, assisting small industries to set up common treatment and disposal facilities, etc.

- National Environment Policy, 2006 - This is the comprehensive policy statement intended to mainstream environmental concerns in all developmental activities. It outlines the strategies for addressing key environmental challenges facing in the country. The major principles of the policy include the right to development and equity along with
environmental standard setting and a precautionary approach.

**Chapter-3 LIABILITY OF MNC'S IN ENVIRONMENTAL POLLUTION: CONSTITUTIONAL (REMEDIES) AND PERSPECTIVE**

Environmental pollution, therefore, may be described as the unfavorable alteration of our surroundings and it occurs mainly because of the action of man. Environmental pollution may take place through changes in energy patterns, radiation levels, chemical and physical constitutions and abundances of organism.

Pollution includes inter alia —

1. Release of materials into atmosphere which make the air unsuitable for breathing;
2. Harm the quality of water by any release materials;
3. Harm the quality of soil by any materials;
4. Give out substances which damage the health of human beings, plants and animals; and
5. Odour and noise which may cause danger to health.

Constitutional Courts are forums of principles. Development of constitutional law takes place when jurisprudential expansion of the contours of the rights enumerated in Part III of the Constitution and Part IV of the Constitution is undertaken. Jurisprudential development embodies evolving concepts like inter-generational equity in environmental laws, modern ultra-vires doctrine based on rule of law, the precautionary principle in environmental laws, the polluter pays principle in environmental laws and the bare minimum provision principle in resource allocation disputes (socio-economic rights). Since such jurisprudential expansion of law is an on-going process from time to time, we need to revisit constitutional values like welfare rights. That is the reason why we have selected the theme of this lecture to be "Reframing of Welfare Rights under the Indian Constitution".
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Preamble to the Constitution though, by itself, is not enforceable in a court of law yet it summarizes the aims and objects which the constitution seeks to establish and promote. Preamble to our Constitution besides, other things firmly stands for socialism, which primarily aims at providing decent standard of life to all its citizens. Requirement of decent of pollution free environment is most important of all the requirements necessary to achieve the decent standard of life. Thus the problem of pollution is not the problem of any one or some of the members of the society but it is social problem which requires adequate state attention and intervention to tackle this problem in order to secure a just social order for the promotion of welfare of the people.

Apart from several personal rights which the Supreme Court has spelt out of Art, 21, as stated above, the Supreme Court has made a signal contribution to the welfare of the people by using Art. 21 for the improvement of the environment.

The expansive interpretation of ‘life’ in Art 21 has led to salutary development of an environmental jurisprudence in India. Although a number of status have been enacted with a view of protect environment against pollution, and an administrative machinery has been put in place for the purpose of enforcement of these statues, the unfortunate fact remain that the Administration has done nothing concrete towards reducing environmental pollution.

In this context, the Supreme Court has performed a yeoman service by taking cognizance, in a number of cases, of various environmental problems and giving necessary directions to the Administration. The Court has thus compelled an inactive and inert Administration to promoted a broad social interest. For the purpose, the Court has depended upon such Directive Principles as those contained in Arts. 47 and 48A as well as on the Fundamental Duty contained in Art. 51A(g) of the Constitution.
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On the question of relationship between ecology and Art. 21, the thinking of the Court is that since the right to life is a Fundamental Right under Art. 21 and since the right to life connotes "quality of life", a person has a right to the enjoyment of pollution free water and air to enjoy life fully.

Any disturbance of the basis environment elements, namely, air, water and soil, which are necessary for 'life' would be hazardous to 'life' within the meaning of Ar. 21 of the Constitution. The Supreme Court has accepted the doctrine of public trust which rests on the premises that certain natural resources like air, sea, waters and means for general use and cannot be restricted to private ownership. These resources are a gift of nature and the State, as a trustee thereof, is duty bound to protect them. The State is the trustee and general public the beneficiary, of such natural resources as sea, running waters, air, forests, ecologically fragile lands.¹

Therefore, if anything endangers or impairs that quality of life in derogation of laws, a person can take recourse to Art. 32 or Art. 226 for removal of pollution of water of air which may be detrimental to the quality of life. A petition for prevention of pollution is maintainable at the instance of the affected person or persons, or even by a group of social workers or journalists.² Numerous cases complaining of environmental pollution have come before the courts by way of public interest litigation which is filed under Arts. 32 of 226.

The Brundtland Commission asserted that only economic growth can eliminate poverty. It is the UNCED’s efforts to put on record that economic growth cannot be based on over exploitation of the resources but must be managed in such a way so as to enhance the resource base and on a global consensus. Thus economic growth is the requirement of the day and the need of the hour in order to achieve sustainability or

sustainable development. It is noteworthy; however, that in the pre-UNCED period say 1990 there was no call as such for an international participation as regards the sustainable development.

Special economic zones generate several conflicts between project proponents and local inhabitants. The prime reason behind these frequent conflicts is that the oustees are lefts without just and adequate compensation. The brewing tension may even lead to repressive measures taken by governments. Karnataka Industrial Area Development Board Vs. C Kenchappa\(^3\) raises such a grave question. Can land used by the people for grazing agricultural and residential purposes be acquired for locating information technology industry? if it is so done, is the act conducive to sustainable development? The Supreme Court answered the questions with an insight into the evolution and growth of the concept of sustainable development.\(^4\) The court directed that in future the consequences and adverse impact of development must be properly comprehended before any acquisition for development is attempted. The lands acquired for development should not be those that gravelly impair the ecology and the environment.

In TN Godavarman Thirumulpad (87) Vs. Union of India\(^5\) the apex court called for a long term (50 years or longer) commitment to manage forests for future generations. For sustaining forests, a naturally functioning forest ecosystem is essential. This means letting the forests develop and progress without significant human intervention. Thus, the naturalistic value system, whatever nature does or not, is better than what humans do. This is a nature-dominates-man perspective.\(^6\)

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\(^3\) AIR 2006 SC 2038

\(^4\) Ibid, pp 2041-2049. The discussion revolved around the environment provisions in the Constitution, the order doctrines evolved by courts and the doctrine of sustainable development interspersed with extensive quotations from prior decision, citation of international instruments and references to academic writings.


\(^6\) Parks and natural reserve creations, non-intervention in insects, disease and fire process and reduction of human activities are typical policy situations, Ibid, pp 22, 23.
The Polluter Pays Principle is an international guideline for environmental policy formulation and environmental liability. It simply implies that the person who damages the environment must bear the cost of such damage. Since pollution is often an externality and imposes a social cost, it does not get reflected in its entirety in the private cost of the polluters, leading to more pollution than is economically optimal. The Polluter Pays Principle is an attempt to make polluters bear the "real" social cost, thereby bringing pollution to the optimal level. The Swedish Journal of Economics, Vol. 77, No. 1, Public Finance: Allocation and Distribution, (March 1975), pp. 56-68; downloaded from JStore] The economic rationale of the Polluter Pays Principle is that "prices of goods (depending on the quality and/or quantity of environmental resources) reflect, more closely, their relative scarcity and that economic agents concerned react accordingly. The principle had been recommended by many European academics and the OECD since the 1970s and was formally adopted in Europe in the 1987 Act. The OECD was also responsible for metamorphosing this economic principle into an established legal principle. The Polluter Pays Principle originally applied only to those actually "polluting" the environment with emissions etc, in the strict sense of the word. However, the principle has now been applied to any activity, which contributes to deterioration of the environment, rather than being strictly limited to polluting activities. On some occasions, this is also referred to as "Extended Polluter Pays Principle". The Polluter Pays Principle is typically enforced by direct regulation or economic incentives, which leads to the polluter bearing the cost for abatement of pollution. There are command and control measures wherein the government may specifically allow or disallow certain products, methods, or scientific techniques to polluters. The second method used to make polluters face the true social cost of pollution is taxation. This usually involves a direct tax on every unit of pollution or on every unit produced by the polluting production activity. Both involve
some kind of direct government interference directly or indirectly via
taxes. A third method of internalizing pollution is through market based
instruments by specifying property rights between the polluter and the
victim.

Parens patriae provides standing to states. A country may sue as
parens patriae to prevent or compensate for harm caused to its citizens
as a whole. The concept of parens derived from the English constitutional
system whereby the king held duties in his capacity as “father of the
country”. The monarch served as guardian of persons with legal
disabilities such as ‘infants, idiots and lunatics’.

In Charan Lal Sahu Vs. Union of India the Indian Supreme Court
upheld the sole right of the Indian Government to represent the victims
under the preamble and s 3 of the Act. It recognized that Section 3(3)
applied the right to all courts before the Act was enacted:

“Provided that in case of any such suit or other Proceeding with
respect to any claim pending immediately before any court or other
authority outside India the Central Government shall represent and act
in place of or along with, such claimant if such court or other authority
so permits.”

Public Trust Doctrine

Another major principle accepted by the Supreme Court is the
public trust doctrine for the protection of natural resource. This doctrine
came up for consideration in the M.C. Mehta v.Kamal Nath. A rather
unusual situation had arisen in this case. The flow of the river Beas was
deliberately diverted because it used to flood Span Motels in the Kulu
Manali valley in which a prominent politician's family had a direct

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7 Hawai v. Standard Oil of California 405 US 251 (1972) (USSC). All reference are to the citation at 2
Env LR 2013 at 20134 (Hereinafter Hawai v. Standard Oil).
9 Charan Lal Sahu Vs. Union of India (1990) AIR 1480 (SC) (Hereinafter the Sahu Case).
10 Bhopal Act s 3(3).
interest. The motel was also allotted protected forestland by the State Government and had also encroached on protected forestland, which encroachment was subsequently regularized. The Supreme Court used the public trust doctrine in this case to restore the environment to its original condition. Briefly, this doctrine postulates that the public has a right to expect that certain lands and natural areas will retain their natural characteristics. Applying the public trust doctrine, the Supreme Court cancelled the lease of forestland granted in favour of Span Motels and the State Government was directed to take over the area and restore it to its original condition. The motel was directed to pay compensation (damages for restitution of the environment and ecology of the area). It was also asked to show cause why a pollution fine be not imposed. While deciding the show cause notice regarding imposition of a pollution fine, the Supreme Court held that in law the fine could not be imposed without a trial and a finding that the motel is guilty of an offence under the Water (Prevention and Control of Pollution) Act, 1974. Accordingly, no pollution fine was imposed on Span Motels but it was asked to show cause why it should not pay exemplary damages. After considering the reply of Span Motels, exemplary damages of Rs.10 lakhs were imposed. Roman law recognized the public trust doctrine whereby common properties such as rivers, seashore, forests and the air were held by the Government in trust for free and unimpeded use of the public. These resources were either owned by no one (res nullius) or by everyone in common (res communius). In English law, the public trust doctrine is more or less the same but with an emphasis on certain interests such as navigation, commerce and fishing which are sought to be preserved for the public. There is, however, some lack of clarity in this regard on the question whether the public has an enforceable right to prevent the infringement of the interests in common properties like the seashore, highways and running water. The public trust doctrine primarily rests on the principle that certain resources like
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air, sea waters and the forests have such a great importance to the people as a whole that it would be wholly unjustified to make them a subject of private ownership. The said resources being a gift of nature, they should be made freely available to everyone irrespective of the status in life. The doctrine enjoins upon the government to protect the resources for the enjoyment of the general public rather than to permit their use for private ownership or commercial purposes. Though the Supreme Court and the High Court of India did not specifically refer to the Doctrine of Public Trust directly, in many cases they have given effect to this doctrine implicitly. Though traditionally the Doctrine of Public Trust was applied only for protection of access to the common for public benefit, now the Doctrine is being applied even to prevent over exploitation of the environment. Now this doctrine is being used as a legal and planning tool for the fulfillment of sovereigns role as trustee of environment for future generations.

Chapter 4 TORTIOUS LIABILITY OF MULTINATIONAL CORPORATIONS FOR ENVIRONMENTAL POLLUTION IN INDIA

Environment disaster means an event or occurrence that has the potential for causing injury to life or damage to property or the environment. The magnitude of the phenomenon, the probability of its occurrence and the extent and severity of the impact can vary. In many cases, these effects can be anticipated and estimated.

A set of prevailing or consequential conditions composed of physical, socio-economic and political factors which increase a community's susceptibility to calamity or which adversely affect its ability to respond to events. The community and its members may or may not be willing participants in contributing to or tolerating the conditions. Taken together, they create a dynamic mix of variables, each of which results from a continuous process. Vulnerabilities can be physical, social or attitudinal and can be primary or secondary in nature.
Disaster may be come by earthquake, landslide, tsunami, volcanic eruption, tropical cyclone (typhoon, hurricane), flood, draught, environmental degradation pollution, desertification, etc), bushfire (wildfire), civil conflict, population displacement, epidemic, biological and technological hazard (industrial accident). These are the following causes by which any environmental disaster may be come and on the other hand we have to take all safety measures to protect the public at large in our country and also around the globe.

The interests protected by the law of torts, Common law develops incrementally by virtue of the doctrine of precedent but it is possible to classify, in broad terms, the general nature of interests which the law of torts protects, personal security, property, reputation, economic interests, Reference should be made to the various chapters for more detail. The Following paragraphs simply draw the reader's attention to the specific torts which may be relevant to the particular interests. Personal security is most obviously protected by the torts of trespass to the person and trespass to land. When negligence it studied it is clear that this tort also to play in ensuring that an individual does not suffer hare by the unreasonable acts or omissions of others. Nuisance helps to protect an occupier of land from activities on neighbouring land which are detrimental to health or comfort.

Manohar Lal Chopra Vs. Rai Baja Seth Hiralal

The Supreme Court has held that Courts also have an inherent power to issue a temporary injunction in circumstances that are not covered by the provisions of order 39 when the Court is satisfied that the interest of justice so require.

Negligence (Lat. negligentia, from neglegere, to neglect, literally "not to pick up something") is a failure to exercise the care that a reasonably prudent person would exercise in like circumstances.\textsuperscript{12} The area of tort law known as negligence involves harm caused by carelessness, not intentional harm. According to Jay M. Feinman of the Rutgers University School of Law, "The core idea of negligence is that people should exercise reasonable care when they act by taking account of the potential harm that they might foreseeably cause harm to other people." \textsuperscript{13} "those who go personally or bring property where they know that they or it may come into collision with the persons or property of others have by law a duty cast upon them to use reasonable care and skill to avoid such a collision." Fletcher v Rylands ([1866] LR 1 Ex 265) Through civil litigation, if an injured person proves that another person acted negligently to cause his injury, he can recover damages to compensate for his harm. Proving a case for negligence can potentially entitle the injured plaintiff to compensation for harm to their body, property, mental well-being, financial status, or intimate relationships. However, because negligence cases are very fact-specific, this general definition does not fully explain the concept of when the law will require one person to compensate another for losses caused by accidental injury. Further, the law of negligence at common law is only one aspect of the law of liability. Although resulting damages must be proven in order to recover compensation in a negligence action, the nature and extent of those damages are not the primary focus of negligence cases.

\textsuperscript{13} Deakin, Tort Law, 218
Chapter-5 CRIMINAL LIABILITY OF MNC'S IN ENVIRONMENTAL MATTERS

The relationship between international environmental law and international humanitarian law, like relationships between many other subsystems of contemporary international law, has not yet been articulated. The problem of environmental damage in international armed conflict lies at the intersection of these two branches and thus provides an ideal opportunity to investigate this relationship. Rather than simply evaluating the applicable international law rules in their context, we break them into elements that we separately assess from both (international) environmental law and international humanitarian/international criminal law perspectives. By doing so, we identify how international law rules for cross-sectoral problems may appropriately combine the existing expertise and institutional strengths of simultaneously applicable branches of international law, and also discover how an evaluation of the ultimate appropriateness of the cross-sectoral rules adopted may be substantially affected by the different frames of reference that are used by those working within the different fields.

The endorsement of criminal liability on corporation is the twentieth century phenomena, as we can see that in the modern world corporation has affected the lives of people in the positive and as well as in the negative ways because individuals owe a duty to the corporations not to harm or injure others in society without justification, so do companies owe a duty not to poison our water and food, not to pollute our rivers, beaches and air, not to allow their workplaces to endanger the lives and safety of their employees and the public, and not to sell commodities, or provide transport, that will kill or injure people.
Abstract

Imposing adequate controls over multinational conduct and achieving accountability by multinationals for their conduct both at home and abroad should be a major objective of every industrialized power. In the criminal law, corporate liability determines the extent to which a corporation as a fictitious person can be liable for the acts and omissions of the natural persons it employs. In India many disasters were done by the corporations: For instance -Uphar Cinema Tragedy\textsuperscript{14} or thousands of scandals and white collar crimes that needed immediate concern. But despite the so many disasters the law was unwilling to impose criminal liability upon the corporations and this is because of two reasons:\textsuperscript{15}

1. That the corporations cannot have the mens rea or guilty mind to commit an offence, and
2. The corporations cannot be imprisoned.

Corporate criminal liability under environmental, antitrust, securities and other laws has grown rapidly over the last two decades. Then also the general belief in the early sixteenth and seventeenth centuries was that corporations could not be held criminally liable. The reason for that is as follow

1. Company is an artificial person
2. It could not have the mens rea, which must be complied with act if the act to render someone guilty.

But from last two centuries the concept of such liability could be taken on its peak. The reason of it is the increasing crimes in the society due to the corporations.

\textsuperscript{14} Uphar Tragedy v UOI 104 (2003) DLT 334
\textsuperscript{15} Zee Telefilms LTD vs Sahara India Company Corporation LTD 2001(3) recent criminal report criminal 292; Motorola Inc v UOI2004,Cri UI 576
However, this concept is not pervasive in modern legal systems. Some countries, including Brazil, Bulgaria, Luxembourg and the Slovak Republic, do not recognize any form of corporate criminal liability. Other countries, including Germany, Greece, Hungary, Mexico and Sweden, while not providing for criminal liability, nevertheless have in place regimes whereby administrative penalties may be imposed on corporations for the criminal acts of certain employees. The countries that do impose criminal liability of some kind on corporations adopt varying approaches to the form and scope of this liability. The most common models could be characterized as involving 'derivative' liability, in which the corporation is liable for the acts of individual offenders.

The term 'Corporate criminal liability' means the liability imposed upon a corporation for any criminal act done by any natural person. Liability is imposed so as to regulate the acts of a corporation. As we stated earlier this concept of liability is based on the theory of the vicarious liability. So accordingly, a master held to be responsible for the acts done by his agent. Any corporation can be made liable for act of its agent or servant if she/he:

(a) commits a crime;
(b) Acts within the scope of employment;
(c) With the intent to benefit the corporation.
(d) Masters and his associates steadfastly maintain that, no matter how strong the connection between neurotoxic contamination and crime revealed by their research, the principle of mens rea should not be abandoned. Masters, in fact, believes that neurotoxicity data may heighten rather than diminish individual responsibility, since the effects of the contamination can be controlled to some extent through measures such as an improved diet. That a

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15 Perrin(this volume)Pieth2003,259 Pieth 2004, 603
17 109 nanda citing 1US code (usc)
researcher documenting the likely influence of what are typically classified as "external" causes of crime should hew to the principle of mens rea, which typically looks to choices within an individual's control, is a noteworthy feature of his research. In particular, if it is true that, as Masters' research suggests, poorer members of certain racial minority groups are disproportionately affected by neurotoxic contamination, an unwavering insistence on the notion of mens rea could have volatile political implications. On one hand, the hypothesis seems to present data that would be most welcome to the political left since it offers an explanation for criminal action that focuses on larger social explanations for crime, rather than on some individual action. For example, evidence of neurotoxicity could become a new form of individual criminal defense like involuntary intoxication, which may result in acquittal for certain types of criminal offenses.

(e) The final settlement attracted review petitions under article 137 and writ petitions under article 32 of the Constitution of India, raising certain fundamental issues as to the constitutionality, legal validity, propriety, fairness and conscionability of the settlement of the claims before the apex court in the Union Carbide Corporation case. The contentions of the petitioners had a long story to tell but Venkatachaliah, J. Delivering the majority view, grouped them under 10 points A to J, mainly concentrated on the question, for example, the jurisdiction of the court, the function of the court stifling of criminal prosecution, fairness-hearing, application of natural justice. The Supreme Court, unfortunately did not came out with an unanimous opinion. There were three judgments: Venkatachaliah, J. Delivered the majority opinion on his own behalf and on behalf of K.N. Singh and N.D. Ojha, JJ. A.M. Amadi,
J. Though ‘by and large in agreement’ with the majority opinion, was in dissent on ‘a couple of aspects’. Ranganath Misra, C.J. though ‘entirely’ agreed with the majority and was also conscious of avoiding multiple judgment, found that present litigation ‘where something more than what is said in the main judgment perhaps should be said’.

Chapter-6 LIABILITY OF MNC’S IN ENVIRONMENTAL POLLUTION : LEGISLATIVE FRAMEWORK IN INDIA

The Environment (Protection) Act 1986

This Act was enacted in the aftermath of the Bhopal gas tragedy in 1984 claiming more than 3000 lives. The Statement of Objects and Reasons of this Act refers to the decisions taken at the Stockholm Conference in June 1972 and expresses concern about the decline in environmental quality, increasing pollution, loss of vegetal cover and biological diversity, excessive concentrations of harmful chemicals in the ambient atmosphere, growing risks of environmental accidents and threats of life system.

According to this Act environment includes ‘water, air and land and the interrelationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro organism and property’. It defines hazardous substance as ‘any substance or preparation which, by reasons of its chemical or physiochemical properties or handling, is liable to cause harm to human beings, other living creatures, plants, micro-organism, property or the environment’.

The Public Liability Insurance Act, 1991

The Statement of Objects and Reasons mentions the need ‘to provide for mandatory public liability insurance for installations
handling hazardous substances to provide minimum relief to the victims. Such an insurance apart from safeguarding the interests of the victims would also provide cover and enable the industry to discharge its liability to settle large claims arising out of major accidents. If the objective of providing immediate relief is to be achieved the mandatory public liability insurance should be in the principle of "no fault" liability as it is limited to only relief on a limited scale. However, availability of immediate relief would not prevent the victims to go to courts for claiming larger compensation. Hazardous substance means any substance or preparation which is defined as hazardous substance under the Environment (Protection) Act, 1986, and exceeding such quantity as may be specified, by notification, by the central government.

The Public Liability Insurance (Amendment) Act, 1992 states that the 1991 Act could not be implemented on account of the insurance companies not agreeing to give insurance policies for unlimited liability of the owners. This Amendment limits the liability of insurance companies to the amount of insurance policy but the owner’s liability shall continue to be unlimited under the Act. It provides for creation of an Environment Relief Fund with the additional money collected from the owners having control over handling of hazardous substances.

There is an increase in environmental litigation due to heightened awareness and emerging environmental challenges along with rapid economic and infrastructural growth that has resulted in pressures on the environment. Earlier there were no dedicated courts for environmental cases. A mechanism has now been set up in the form of a specialised National Green Tribunal
NGT) for effective and expeditious disposal of such cases. It is provided that in addition to the principal place of sitting, there shall be four additional places of sitting so as to facilitate access to the justice. The NGT has original jurisdiction under seven environmental statues to settle disputes. The Tribunal has also been empowered to award relief and compensation related to death or injury to persons or damage to property or environment on the principles of no fault liability. It also has appellate powers. The NGT provides for imprisonment or fine up to 10 crore rupees for individuals and 25 crore for companies for non compliance to its orders. An application for relief may be made even by any representative, organisation in the field of environment, Government, Central Pollution Control Board or State Pollution Control Board besides the affected person.

Chapter-7 PROBLEMS OF ACCOUNTABILITY OF MULTINATIONAL CORPORATIONS : CONCEPTUAL STUDY

The Seveso disaster was an industrial accident that occurred around 12:37 pm July 10, 1976, in a small chemical manufacturing plant approximately 15 km (9.3 mi) north of Milan in the Lombardy region in Italy. It resulted in the highest known exposure to 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) in residential populations which gave rise to numerous scientific studies and standardized industrial safety regulations. The EU industrial safety regulations are known as the Seveso II Directive. Cases of Vedanta, seveso, posco etc. have been discussed.

The order in the Vedanta case reads: “Upholding the recommendations of FAC, I (Jairam Ramesh) have come to the following conclusion: the Stage 2 forest clearance for Orissa Mining Corporation
and Sterlite bauxite mining project on Niyamgiri hills... stand rejected." It goes on: "The primary responsibility of the ministry is to enforce the laws that have been passed in Parliament. For the MoEF, this means enforcing the Forest Conservation Act, 1980, the Environment Protection Act, 1986, the Forest Rights Act, 2006 and other laws. It is in this spirit that the decision has been taken."

**POSCO India Private Limited** (commonly **POSCO India** or **Posco-India**) is an Indian subsidiary of Korean conglomerate POSCO. Its parent company POSCO signed a memorandum of understanding in June 2005 with the state government of Odisha to construct a $12 billion steel plant. Various regulatory delays and controversies prevented the company from starting construction. The memorandum expired in June 2011, and as of April 2012, it has not been renewed. Apart from Odisha, POSCO India has project sites in the Karnataka state.

**Chapter-8 UNION CARRIBE CORPORATION AND BHOPAL DISASTER: A CASE STUDY**

The mid-night tragedy of Dec. 2-3, 1984 in Bhopal has challenged the human conscience and its awareness as to its scientific and technological inventions and developments. The implementation of science and technology for the welfare and prosperity of human beings is intolerable but the measures and the standard of science and technology has to be yet considered thoroughly. We have brought in our purview of knowledge of the vast universe natural phenomenon and principles and the use of atomic power. Human beings have got a capacity here and see the things the conversions and the actions which are taken place at a large distance. The modern technology is trying to make human itself in the laboratories. Besides these all powers the human beings
are still just like a innocent baby. Such a large scale of industrialization, establishment of atomic power plant flight in its case. Human beings are ignoring the basic principles of nature and hereby disturbing and destroying the equilibrium of the atmosphere and natural phenomenon. All the things and the bio-activities in this universe are carried on several mathematical and carbonic calculations and process. As the human beings have the knowledge of carbon cycles, oxygen cycle, nitrogen cycle etc. which are continuously taking place in the atmosphere. The deadlock in any one of the cycle will pose a danger to the very existence of human beings in the world. On the basis of various scientific reports produced by various national, international organisations and conferences. The temperature of earth is steadily increasing and is likely to melt the frozen ice of the polls which will not only increase the water level of seas but also is a challenge to the climatic and seasonal systems. The large scale presence of carbon dioxide and sulfer dioxide etc. Noxious gases in atmosphere has caused the acidic rains on the land which will destroy all the vegetables and animals of the earth and will create a lot of problems as suffocation, pulmonary troubles and pollution one.

Thus it is clear by the above discussion that improper and misguided implementation and utilisation of science and technology is likely to challenge the very
existence of human beings existence specially in developing countries.

The incident of Bhopal is not the first incident which took place in the industrial sphere. It is submitted that there were also very serious mishappenings in industries. This is the second one accident which took place in India and claims the life of such a large scale. The first one was Chasnala Mine case in 1975 in which death toll touched the point of 500 persons. In Carbide case the accident and its consequence did not took place in a certain premises. In this case accident was so extensive that it affected the whole city of Bhopal. Thus, it is clear that it is not a mere industrial incident but an incident of dis-balance of atmosphere. A clearcut case of pollution. Although Indian Government has formed the Ministry of Environment and a Commission on Environment headed by Prime Minister. But this accident is clearcut challenge to administrative bodies who are liable and oblige to do something for the purification of environment. It poses a picture of insincerely and unseriousness in taking such a serious type of problems. They are wasting their times in debates, discussions and tours and are making only paper tigers. No any such effective measures till now been adopted by them for the flourishment of our environment. Bhopal tragedy raises several questions –

(a) What is the licencing policy of Government and it is proper and just to what extent?
(b) What is the standard of safety measures and which is to be taken in Industry in India?

(c) What about the waste products is done, are they repurified or left to atmosphere without any reprocessing?

(d) Is Government has taken any step to check the pollution which is made by the industries?

(e) What are the general norms of Government, our hazardous industries?

(f) Is there any penalising processing procedure for breach of conditions and terms imposed by the State on the Factories?

(g) Is Government serious about the health and prosperity of workers and the residents of any area of any factory?

(h) Whether Government takes pollution problems in India as a whole or on unit systems?

(i) Has the Government any code of conduct about the safety measures and other things for multinational corporations?

(j) Whether the multinational corporation has paid the adequate amount of damages?

Although, Government of India has enacted Factory Act, 1948, Industrial Disputes Act, 1947, Minimum Wages Act, 1948 and Workmen Compensation Act, 1923 etc. for the welfare of labours and a Parliamentary legislation on
environment namely. The Air (Prevention and Control of Pollution) Act, 1981 has also been enacted. Besides it, various rules by Union and States Governments have also been applied. But the application of such enactments and rules is not so strict as it ought to be. The medium path of such is searched for the benefit of industrialist and the officials are also benefited indirect thereby. In composing various provisions of various Acts, they adopt tolerant attitude prejudicial to the public and environment. The thing to be noted here that it is not sufficient to make the law but it should be enforced properly. It is the implementation of law, which vitiate the very object of it by a implementation of a lesser degree. Our State is welfare state not a bureaucratic and autocratic State which requires several specific standards which may be more or less than the other countries. The basic principle of honesty and truthfulness should be kept in mind by those who are the framer and administrator of law. A small benefit to any person may cause a biggest destruction. For granting the licence in any factory authority concerned therein must consider all the actions and consequence thereof which is or likely to be born out by such activities. The inspecting staff who have to give the report, must be serious and not corrupt because it is his report on which an industry is to be set up. So anything which causes such a type of accident, must not be tackled unseriously. Hence, they have a moral duty as well as legal obligation to report to the Government. A
personal liability should be imposed on their inspectors and if they are facing any supervision by their immediate bosses or superior official authority. They must forward a confidential report to the ministry for the purpose. If the ministry does not take proper action, the Government shall be held responsible for any accident which take place by the establishment of such a industry.

India has got a complex culture which is based on our surroundings and which is not ready to loose our cultural inheritance. The forests and fresh atmosphere is our heritage which have bestowed us with a definite standard of physical and mental status. Thus, it is clearly by losing a signal point the safety-measures regarding the industry; It affects loose each and everything; like fresh atmosphere the possibility of life; vegetables and other edible materials, it also effects on psychological and metaphysical aptitude, thus it is degraded and degenerated in every sphere of social as well as biological activities. Therefore, a single drop of poison make cause the death of the healthy person. The industries are producing and manufacturing dangerous things, or keeping which is dangerous per-se for its use in any manufacture must also be serious for safety measures. It is not only the duty of the Government but of industrialist also to have sufficient means and alternatives to avoid all sought of accidents which is or likely to take place in future. If such a type of accident take place except by the
Act of God, the liability should be imposed on those industrialists who are setting the industries.

Although the laws have been made for the preservence and maintenance of atmosphere yet that is not being properly obeyed. The fluctuations are there in observance in India, a large number of industries do not have reprocessing plant for their wastage. They throw the slag on the roads and on lands. They often make to pass their wastage through drainage system to rivers. They cause to leave their gaseous waste product in atmosphere which increases the potential of harmful gas in atmosphere. By inhalation those enter in body and cause damage to body cells and bio-chemical reactions in body. Thereby producing several diseases for human beings. For instance a place where atomic plant is installed, covers a vast area for epidemic disease as skin disease, cancer and T.B. etc. Now it is the duty of Government, people and person concerned to take effective measures and to be serious for the benefit of our healthy environment.

It is not sufficient to take an alternative device to negativity the adverse effect of any reaction or any danger which is in due course of that arises but they must have at least three devices must be always ready to meet any challenge those persons who are to handle and to operate these devices or instruments, should be well equipped as it requires in Section 36(1) of the Factory Act 1948.
Abstract

When the liabilities have been fixed, there arises no question of escaping from the liability. The person liable whether industrialist, or officer concerned, or the Government, the penalty must be imposed there very extensive and elaborate penal laws must be enacted to meet all the contingencies in such cases. Besides it, those who are victims of any such incident whether worker or other persons must be provided with adequate and meaningful relief. Although we know one who dies, may not be brought again in the world by any process but it is duty of the State to provide to the survivor of deceased person all facilities and other psychological relief which were to be provided to them by the deceased person, as far as practicable. In case of those injuries which are other than death of victims should be provided with medical relief besides it with the maintenance for the period as long as his inability to follow his daily pursuits exists. The effective steps should be taken by the Government in this respect.

There are many multinational companies, which are engaged in various activities are in India. In its object of speedy developments and upliftments of the standard of life India requires foreign aid as well foreign investment in India. It is also the per-se of Indian Government of investing its currency and installing its projects in various other third world countries. Our philosophy of brotherhood that is of "BASUDHEIV KUTUMBCUM." Our motto is to live and let live we do not want enrichment
and prosperity for ourselves but want to distribute and disperse its fruits to every one in the world.

The effect of Gas-Catasterophe on the public as well as workers is the most regretful and the steps for their relief have been taken by Government is commendable. The Government is sincere about the amendment of safety provisions under the Factory Act 1948 specially for the Chemical Industries so that such catastrophe may not again happen. The Government is also serious for framing the code of conduct for multinational corporations. The effect of the leakage is still continuous because the victim people have suffering from many serious diseases. The Government's step to shut the plant at Bhopal is regretful one because the employees and workers of the plant become unemployed. It means that their families may ruin. For the solving of this problem, the Government should take steps for their rehabilitation for such employees and workers. But on the other hand this declaration for shutting is a matter of happiness because there would be surety of life for the residents of Bhopal. The licensing policy for such factory must be strict or if such factory is set up, it should be much faraway from the residents area. The steps taken by the Government for the recovery of compensation from multinational Union Carbide is adequate one but it is the necessity of time to disseminate and distribute the compensation to the victims in a proper ratio of injury sustained by them.
CONCLUSION AND SUGGESTION

While the challenges are formidable, there are a number of positives, which provide the Ministry an opportunity to take forward the environmental agenda, building on the strengths and the experience of implementation accumulated over the last two and a half decades. The opportunities are mainly the following:

- Increased public awareness and civil society pressure
- Improved economic status
- Need to align with global standards and practices
- Strong technology base
- Optimum utilisation of Centres of Excellence and other attached institutions

Strengths

- A robust regulatory framework
- Institutional Structure
- Mainstreaming of Sustainability Concerns
- Creation of Conservation and Pollution Abatement Infrastructure
- Successful implementation in certain areas
- Increased Environmental Awareness, civil society involvement and transparency

Opportunities

- Increased public awareness and civil society pressure
- Improved economic status
- Need to align with global standards and practices
Abstract

- Strong technology base
- Optimum utilization of Centres of Excellence and other attached Institutions

Core Learning Agenda for Environmental Concerns

- Guidelines for support to environmental research for environmental management and natural resources. Strengthening of scientific manpower and arranging multi-disciplinary infrastructural facilities for environmental research.

- Sensitizing schools/colleges/universities, professional and management institutions, corporate sectors about environmental issues. Organising National Environmental Awareness Campaign and National Green Corps.

- Preparing State Level Action Plans for climate change (SLAPCC) consistent with the strategy outlined in the National Action Plan on Climate Change (NAPCC). Reduce carbon sustainable by 20 to 25 percent by 2020 in comparison to the 2005 level as a objective of NAPCC.


- Ensure timeline for environmental clearances.

- Consultation with stakeholders while formulating standards as well as policy, involvement in decision making apart from formulation of Legislations, Regulations and Guidelines for control on pollution.
• Use of international best practices and their adoption on pollution. Indigenized wherever possible depending on the techno-economic feasibility while formulating standards. Promotions of GIS/GPS is also being emphasized.

• Implementation and monitoring of standards, setting up of network of water, air and noise monitoring stations, identification of critically polluted areas and pollutants, preparation of plans, programmes, scientific inventorization, studies and projects.

• Capacity building programmes which inter-alia includes national and international exposure. Technical strengthening like new parameters for National Ambient Air Quality Standards and lidar based forecasting of air quality.

• Enhancement of delivery services like computerization, fixing timelines, digitalization of data, promotion of ITC etc.

• Conservation activities for rivers on a river basin approach. Prioritizing and implementing action for the tackling pollution in major towns of Ganga. Adoption of new sewage treatment technology.

The Core Learning Agenda for Forestry and Wildlife Concerns

• Consultation with public/academicians/NGOs/ Practitioners for improvement of ongoing activities on afforestation. Capacity building through scientific/extension institutions.

• Strengthening of integrated development of wildlife habitats and providing adequate funds and training to forest personnel.
Abstract

- Consultation with Gram Sabha for constituting the buffer or peripheral area of tiger reserves which aims at promoting coexistence between wildlife and human activity.

- Global Tiger Initiative of World Bank for capacity building to improve the field delivery through exchange of good practices.

- Participation in the International Conventions. Attempts to internalize the international best practices in the ongoing programmes.

- Ensure timeline for forestry clearances.

The examination of the implications of Supreme Court’s innovations for environmental jurisprudence reveals that the application of innovative methods to resolve environmental disputes and implement Court orders is certainly a deviation from the usual adjudication function of the Court. While the procedural innovations have widened the scope for environmental justice through recognition of citizens’ right to healthy environment, entertaining petitions on behalf of affected people and inanimate objects and creative thinking of judges to arrive at a decision by making spot visit, substantive innovations have redefined the role of Court in the decision-making process through application of environmental principles and expanding the scope of environmental jurisprudence. Given the crisis within the executive and legislature in discharging their Constitutional duties, the Supreme Court’s innovative methods have attempted to arrest the dysfunctional trend of other organs and enable the effective enforcement of environmental laws. However, in reminding other organs about their Constitutional duties and enforcing fundamental right of citizens, the Supreme Court has at times, crossed its boundaries.
Abstract

and started interfering in the very basic affairs of environmental management. In resolving more than 100 environmental cases since 1980, the Supreme Court has continuously engaged itself in the management and resolution of environmental conflicts and thereby increased the country’s dependence on the Court for environmental protection. This dependence on a judicial institution that has already exceeded the boundaries of its responsibilities has been further complicated by the lack of monitoring of the Supreme Court’s orders and the vagueness of the legislative and executive roles regarding environmental issues. With its intervention in the interpretation of environmental policy and implementation process, the potential for resolving environmental conflict is hardly over. The review of environmental cases shows that there has been no uniform cooperation from the implementing agencies to effectively implement the Court directions. It is also observed that most of the innovative methods introduced by the Court have neither been followed consistently nor been institutionalised to make a long term impact for the environmental jurisprudence process. In such a situation, how long will the Supreme Court monitor the implementation of its decisions? As the opposition to judicial intervention in the affairs of other organs increase, what will happen if the implementing agencies and people disobey Court decision for the protection of environment? It remains to be seen whether the Court can protect the environment through innovations if there is steadfast resistance from implementing agency or whether it can continue to intervene in the absence of public support. More importantly, it remains to be seen whether
peoples’ faith in the Court’s attempts to protect environment through innovative methods will be belied.

The Taj Mahal Case: MC Mehta v Union of India, WP(C) 13381/1984

In 1984, the Taj Mahal case was brought by MC Mehta, a leading environmental activist, to protect India’s Taj Mahal from air pollution, alleging that industrial emissions were causing the white marble to blacken in places and fungus to grow inside the monument. Mehta requested the implementation of anti-pollution measures or the closure of the pollution causing industries. Over the course of litigation, the Supreme Court passed many orders directing the central, state and local authorities to undertake developmental and regulatory measures for the improvement of the environment and the protection of the Taj Mahal. However, it was not until 1996 that the Court, finding that industries in the area were actively contributing to air pollution, finally ordered 292 coal-based industries to either switch to the use of natural gas or relocate their businesses outside the protected area, with job security or compensatory measures required for employees. While a number of factories complied with the order, many others ignored the order, claiming the cost of such action was prohibitive. Thus, in 1999, the Court ordered 160 factories closed for failure to comply with the order.

The enhanced pace of developmental activities and rapid urbanization have resulted in stress on natural resources and quality of life. The trend of increasing pollution in various environmental media is evident from the deteriorating air and water
quality, higher noise levels, increasing vehicular emission etc. Realising the escalated condition of the environment urgent need for arresting the pollution must be taken. In order to control the pollution the existing legislations in the field of environmental welfare must be enforced with high hand. There is urgent need to establish meaningful mechanisms to involve the public in decision-making as an instrumental tool to achieve better and more efficient decisions and better implementation of environmental law. The Government may must consider the advisability of strengthening the environment protection machinery both at the center and the Sates and provide them more teeth. The heads of several units and agencies should be made personally accountable for any lapses and/or negligence on the part of their units and agencies. The environmental audit by specialist bodies must be made on permanent basis with power to inspect, check and take necessary action not only against erring industries but also against erring officers may be considered. There requires to integrate and balance the concern for environment with the need for industrialisation and technological progress. Non-point source controls washed off fields is the largest source of agricultural pollution in. Farmers must utilize to reduce runoff flows and retain soil on their fields. Common techniques include contour plowing, crop mulching, crop rotation, planting perennial crops and installing riparian buffers. Materials such as paper, some kinds of plastics and glass can and are being recycled. This decreases the volume of refuse and helps in the conservation of natural resources. For example, recovery of one tonne of paper can save 17 trees. Control of land loss and soil erosion can be attempted
through restoring forest and grass cover to check wastelands, soil erosion and floods. Crop rotation or mixed cropping can improve the fertility of the land.

Proper methods should be adopted for management of solid waste disposal. Industrial wastes can be treated physically, chemically and biologically until they are less hazardous. Acidic and alkaline wastes should be first neutralized; the insoluble material if biodegradable should be allowed to degrade under controlled conditions before being disposed. As a last resort, new areas for storage of hazardous waste should be investigated such as deep well injection and more secure landfills. Burying the waste in locations situated away from residential areas is the simplest and most widely used technique of solid waste management. Environmental and aesthetic considerations must be taken into consideration before selecting the dumping sites. Incineration of other wastes is expensive and leaves a huge residue and adds to air pollution. Pyrolysis is a process of combustion in absence of oxygen or the material burnt under controlled atmosphere of oxygen. It is an alternative to incineration. The gas and liquid thus obtained can be used as fuels. Pyrolysis of carbonaceous wastes like firewood, coconut, palm waste, corn combs, cashew shell, rice husk paddy straw and saw dust, yields charcoal along with products like tar, methyl alcohol, acetic acid, acetone and a fuel gas.

Some industrial facilities generate ordinary domestic sewage that can be treated by municipal facilities. Industries that generate waste water with high concentrations of conventional pollutants (e.g. oil and grease), toxic pollutants (e.g. heavy metals, volatile
organic compounds) or other non conventional pollutants such as ammonia, need specialized treatment systems. Some of these facilities can install a pre-treatment system to remove the toxic components, and then send the partially-treated waste water to the municipal system. Industries generating large volumes of waste water typically operate their own complete on-site treatment systems.