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# Certified Environmentalist
# Sample Material

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V-Skills

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# 1. ENVIRONMENTAL MANAGEMENT INTRODUCTION

## 1.1. Introduction

In this new millennium, organizations are rapidly changing their structures, systems, work processes and activities. This changing- environment calls for enterprising managers to manage and respond to the changes in an appropriate manner. It is, therefore, necessary for them to develop a clear focus and direction to facilitate proper decision-making process.

The emerging trends that characterize this millennium are:

- ✓ An era of information revolution, which has influenced the new economy.
- ✓ The traditional supply chains are fast disappearing, paving way to new virtual supply chains. This change calls for an entire revamping of the internal processes and procedures, so far followed in the organization.
- ✓ The relationship among organizations, their customers, suppliers and manufacturers is also undergoing a drastic change.
- ✓ Organizations are becoming extended enterprises. The idea of the extended enterprise with its focus on supply chain management will become the standards for assessing performance in future.
- ✓ There is an increasing concern about the environmental performance and reporting practices. There is also a move towards looking at environmental performance as competitive advantage. There is an increase in demand from the stakeholders for 2 environmentally responsible behaviors from the companies across the globe.

Let us discuss in more detail the environmental problems and the growing concern about them. It is no longer possible to ignore the needs of the society and quite appropriately, management education must address new areas of .interest. In light of this, issues concerning protection, conservation and management of the physical environment are to be addressed with a view to imparting knowledge, increasing awareness, and developing the required skills to solve the environmental problems. This area of action affects almost all sectors and, therefore, calls for action from people all over the world.

Thirty years ago, the international community gathered in Stockholm for the United Nations Conference on Human Environment to sound an alarm about the perilous state of Earth and its resources. That landmark event is widely credited with environmental issues being placed on the international agenda, leading, in turn, to the establishment of environment ministries at the national level, and the increased awareness of the impact that even local decisions can have, on the global environment.

Every activity generates unavoidable environmental impact of some kind or the other, but the ability of people and societies to adapt themselves to and cope with the change is varied.

People in developing countries, particularly in the less developed countries, have less capacity to adapt to change and are more vulnerable to environmental threats and the global change. Poverty is generally recognized as one of the most important causes of vulnerability to environmental threats because the poor tend to have much lower coping capacities and, therefore, they bear a disproportionate burden of the impact of disasters, conflicts, drought, desertification and pollution.

A close study of all the major displacements that have taken place due to development activities reveal that the poorer and the ignorant sections of the society suffer more due to displacements and related job loss and change in livelihood options, etc. Moreover, development initiatives do not always bring benefits to the people who have been dislocated due to them. Human health is increasingly determined by environmental conditions. Deterioration of environmental conditions is a major contributory factor to poor health and a reduced quality of life. The statistics goes like this:

- ✓ Poor environmental quality is directly responsible for some 25 per cent of preventable diseases, with diarrhea and acute respiratory infection heading the list.
- ✓ Air pollution is a major contributor to a number of diseases.
- ✓ Globally, 7 per cent of all deaths and diseases are due to inadequate or unsafe water, and lack of sanitation and hygiene. Approximately 5 per cent of the deaths are attributed to air pollution.

The importance of preservation of the environment and respect for nature form the underlying principle of many cultures of various developing countries. For example, a study of the ancient Indian text Vedas would clearly indicate the importance of love and respect for nature. While environmental conservation may have been a part of cultural and religious heritage of many developing societies, consideration of environmental issues within the developmental context has generally been of comparatively recent origin, certainly not more than two decades.

While addressing the World Conservation Strategy on March 6, 1980, the then Indian Prime Minister, Smt. Indira Gandhi, spoke thus: In India the interest in conservation will not a sentimental one, but the rediscovery of a the truth well known to our ancient sages. The Indian tradition teaches us that all forms of life-human, animal and plant-are so closely interlinked that disturbance in one gives rise to imbalance in the others.

The essence of man's attitude to nature in India is characterized by harmony. Lack of awareness of the laws and forces of nature that keep ecological balance leads to improper behavioral pattern, which results in environmental problems India is a country with vast cultural variations. We have both ancient and modem culture parallel to each other. We still have human beings like the tribal existing as part of nature, in perfect harmony with it, unaffected and uninfluenced by the technological changes of recent times. They draw from nature only what they require and continue to exist as part of the ecosystem. On the other hand, there is the advanced socio-economic system developed by man in which he is a co-creator and in conflict with nature and is dominated by considerations of greed. In such systems there are all kinds of interactions with the ecosystem characterized by exploitation and optimum extraction principles. We have thus problems that confront both developing and developed countries. This is true of all phases of national development. The situation in India is relevant to developing as well as the developed world (T.N. Khoshoo, 1988).

The element of sustainability implies enjoying the bounties of nature, without prevailing over it. As exploitation starts, we cease to utilize nature for our good, and for the benefit and the welfare of our fellow human beings. For example, Kalidasa the great Indian poet, in Kumara Sambavam talks of "milking" earth and not exploiting it. Milking earth is akin to milking a cow. We have to feed and care for the cow before we can milk it. As we can understand, milking is what sustainable development is all about.

There are two basic reasons for our concern with environmental pollution:
- ✓ Human health and welfare, and
- ✓ Sustenance and survival of mankind

Environmental contamination and its impact on human life is already well known. Only the coping mechanisms have undergone changes due to increasing awareness and the tremendous pressure of population increase on the environmental resources. The ancient civilizations had imposed self-restrictions to avoid different forms of pollution, by religious and other spiritual bondage, and not necessarily through legal measures. Legal measures to regulate environmental behavior are a recent development in all the countries of the world. The fact that environmental pollution can make people susceptible to many diseases and even cause premature deaths is a major driving force for pollution control.

## 1.2. Sustainable Development

The concept of Sustainable development (Bruntland Commission 1972) broadly means that the development initiatives be initiated in such a way that the future generations can enjoy the benefits of nature without any compromise. It reiterates that we must use the resources only to the extent to which it is sustainable. Since the Stockholm Environmental Conference in 1972 the focus has been on regulating for the caring capacity of the globe. The important elements in the attempts to achieve sustainability have been on

- ✓ Regulation
- ✓ Consumer awareness
- ✓ Companies' solution of end-of-pipe problems
- ✓ Companies' green product development

The government of each country has developed guiding principles of sustainability from the Stockholm Conference. The United Nations have given an impetus to these Stockholm principles by providing the Agenda 21 through the Earth Summit at RIO in 1992. The principles listed below serve as a source of inspiration to evolve action areas by the national government, depending upon their capacity.

**Principle 1:** Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.

**Principle 2**: States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

**Principle 3**: The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations.

**Principle 4:** In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.'

**Principle 5**: All states and all people shall cooperate in the essential task of eradicating poverty as an indispensable requirement for sustainable development, in order to decrease the disparities in standards of living and meet the needs of the majority of the people of the world. *5*

**Principle 6**: The special situation and needs of developing countries, particularly the least developed and those most environmentally vulnerable, shall be given special priority. International actions in the field of environment and development should also address the interests and needs of all countries.

**Principle 7**: States shall cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the contributions to global environmental degradation. States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command.

**Principle 8**: To achieve sustainable development and a higher quality of life for all people, the State should reduce and eliminate unsustainable patterns of production and consumption and promote appropriate demographic policies.

**Principle 9**: States should cooperate to strengthen endogenous capacity, building for sustainable development by improving scientific understanding through exchanges of scientific and technological knowledge, and by enhancing the development, adaptation, diffusion and transfer of technologies, including new and innovative technologies.

**Principle 10:** Environmental issues are best handled with the participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided.

**Principle 11:** States shall enact effective environmental legislation. Environmental standards, management objectives and priorities should reflect the environmental and developmental context to which they apply. Standards applied by some countries may be inappropriate and of unwarranted economic and social cost to other countries, in particular, the developing countries.

**Principle 12**: States should cooperate to promote a supportive and open international economic system that would lead to economic growth and sustainable development in all countries, to better address the problems of environmental degradation. Trade policy measures for environmental purposes should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade. Unilateral actions to deal with environmental challenges outside the jurisdiction of the importing country should be avoided. Environmental measures addressing trans-boundary or global environmental problems should as far as possible be based on International consensus.

**Principle 13**: States shall develop national law regarding liability and compensation for the victims of pollution and other environmental damage. States shall also cooperate in an expeditious and more determined manner to develop further International law regarding liability and compensation for adverse effects of environmental damage caused by activities within their jurisdiction or control to areas beyond their jurisdiction.

**Principle 14**: States should effectively cooperate to discourage or prevent the relocation and transfer to other States of any activities and substances that cause severe environmental degradation or are found to be harmful to human health.

**Principle 15**: In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

**Principle 16**: National authorities should endeavor to promote the internationalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment.

**Principle 17:** Environmental impact assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority.

**Principle 18**: States shall immediately notify other States of any natural disasters or other emergencies that are likely to produce sudden harmful effects on the environment of those States. Every effort shall be made by the international community to help States so afflicted.

**Principle 19**: States shall provide prior and timely notification and relevant information to potentially affected States on activities that may have a significant adverse trans-boundary environmental effect and shall consult with those States at an early stage and in good faith.

**Principle 20**: Women have a vital role in environmental management and development. Their full participation is therefore essential to achieve sustainable development.

**Principle 21:** The creativity, ideals and courage of the youth of the world should be mobilized to forge a global partnership in order to achieve sustainable development and ensure a better future for all.

**Principle 22:** Indigenous people and their communities and other local communities have a vital role in environmental management and development because of their knowledge and traditional practices. States should recognize and duly support their identity, culture and interests and enable their effective participation in the achievement of sustainable development.

**Principle 23**: The environment and natural resources of people under oppression, domination and occupation shall be protected.

**Principle 24:** Warfare is inherently destructive of sustainable development. States shall therefore respect international law providing protection for the environment in times of armed conflict and cooperate in its further development, as necessary.

**Principle 25**: Peace, development and environmental protection are interdependent and indivisible.

**Principle 26**: States shall resolve all their environmental disputes peacefully and use appropriate means in accordance with the Charter of the United Nations.

**Principle 27:** States and people shall cooperate in good faith and in a spirit of partnership in the fulfillment of the principles embodied in this Declaration and in the further development of international law in the field of sustainable development. The concept of Sustainable Development facilitates good and sound economic growth that can be maintained with minimum environmental impact. It provides a continuous monitoring emphasis as the approach itself calls for overall sustainable orientation. The factors that can promote sustainable development are the following:

- ✓ Population stabilization and health care;
- ✓ Integrated land use planning and watershed management, ensuring availability of adequate area for use as cropland, woodland and grassland for food, fuel, timber and fodder;
- ✓ Re-vegetating marginal land and greening the uncultivated area;
- ✓ Water pollution control in rivers;
- ✓ Air pollution control in industrial pockets;
- ✓ Use of non-polluting renewable energy;
- ✓ Waste recycling and reuse;
- ✓ Conservation of biological diversity;
- ✓ Human settlements without congestion;
- ✓ Slum improvement;
- ✓ Environmental education and awareness

## 1.3. Stakeholder Concept

The theory describing the relationship between companies and stakeholder influence was introduced several decades ago (see, for example, Millstein and Katsh, 1981; Freeman, 1984), and has since been applied in a number of sector studies in the primary, secondary and tertiary sectors. The stakeholder approach basically views the firm as a set of interrelated, explicit or implicit connections between individuals and/or groups of individuals. Stakeholders are generally defined as individuals or groups with a legal, economic, moral and/or self perceived opportunity to claim ownership, rights or interests in a firm and its past, present or future activities-or in parts thereof. Stakeholders with identical interests, claims or rights can be classified into different categories, e.g. employees, shareholders, customers, suppliers, regulators, NGOs, etc. These can be further classified into primary and secondary stakeholders (Clarkson, 1995).

### Primary stakeholders

Primary stakeholders are stakeholders without whose continuing and direct participation or input the firm cannot survive as a going concern. Such stakeholders include owners, investors,

employees, suppliers, customers and competitors, as well as Nature (physical resources and carrying capacity).

## Secondary stakeholders

Secondary stakeholders can be defined as those who, in the past, present or future influence or might be influenced by the firm's operations without being directly engaged in transactions with the firm in question and thus are not essential for its survival. Examples of secondary stakeholders are local communities, local government, social activist groups, and business support groups.

According to Carroll (1992), a stake can be (i) an interest, (ii) a right (legal or moral), and/or (iii) an ownership. Some stakeholder groups, e.g. the company's shareholders, mainly have one type of stake (i.e. an ownership), whereas other stakeholders can have more than one. An example of the latter is local authorities, which have a legal obligation, as defined in regulations and common interests, to create an active business climate as well as to maintain a healthy social and physical environment.

Stakeholder management is about handling stakeholder relationships and the multiple and, often, conflicting interests (stakes) within the complex and dynamic web of persons and/or groups (holders) that at all times surround any company. The critical strategic issue here is that interactions, coalitions, differences in behavior, attitudes and preferences within and across the various group of stakeholders are not static, but in a constant state of flux. The individual group of stakeholders has various means of exerting influence, including rhetoric, ethics, regulation, formal control mechanisms and market mechanisms. As noted by Hill and Jones (1992), stakeholders are identified through the actual or potential harm and benefit they experience, or anticipate experiencing, as a result of the firm's actions or inactions. Therefore, the stakeholder model in Figure 2.1 is an organizational construct, inasmuch as it describes the connections and their internal constituents and legitimacy. The inner circle represents primary stakeholders and the outer circle, secondary stakeholders.

'In practice, it is often difficult and costly, if not impossible, to identify and meet all the demands of a company's stakeholders. Consequently, it is crucial for management to identify, analyze and assess the meaning and significance of each individual group of generic stakeholders and to determine their respective power, in order to be prepared for the conflict that may follow from the prioritizing of competing groups of stakeholders.

Traditional stakeholder management literature has focused heavily on the stakeholder approach to obtain an overview of threats caused by primary and secondary stakeholders. However, additional emphasis should be laid on the opportunity dimension of stakeholder analysis since this can be nurtured and supported by an interactive and symmetrical two-way communication between stake, cause and stakeholder. The rationale behind the classic SWOT (Strength Weakness-Opportunity-Threat) analysis and the stakeholder strategy matrix can also be applied to the operationalization of the model described previously. The outcome is referred to as Secondary - Primary- Opportunity ~'Threat (SPOT) analysis (Ulhoi, 1997). The focus of the SPOT analysis is to identify the stakeholders exerting, or trying to exert, influence on the company's decisions and activities. The nature of the strategic information provided by a SPOT analysis depends on the situation of the company in question. Once the stakeholder groups have been identified and assessed by

management, the stake of each group can then be determined. Thereafter, stakes and groups can be categorized as threats and opportunities.

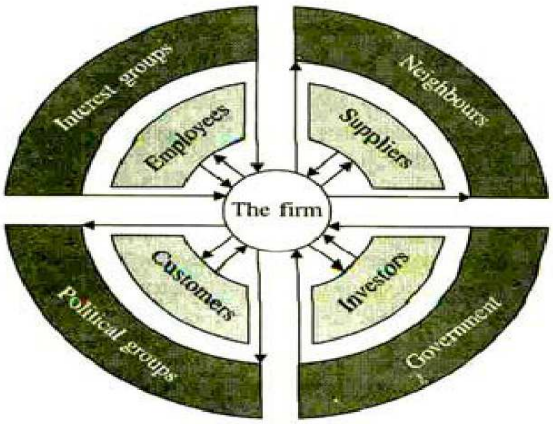


Figure 1.1: The stakeholder model

There .has been a steady increase in the number of environmental issue to be tackled in all the developing countries. It is necessary here to clarify the term environmental issue. Environmental issue refers to areas of human activity that have potentially adverse and direct impact on public health and the environment. It encompasses specific environmental concerns or problems, or perceived problems, for which an adequate policy or a technological response has yet to be properly planned. Acid rains, global-warming and loss of wetlands are regarded environmental issues within the scope of this, definition. Factors such as lack of adequate infrastructure and trained personnel have further aggravated the problem in an already grim situation marked by increasing industrial pollution, uncontrolled emission from the automobiles, and lack of safe water supply. The role of government machinery to control pollution brings about changes in the behavior of different groups, both in public and private, and using the resources becomes very crucial and is demanded from them by the way of new rules and regulations In India the "Bhopal gas leakage" triggered a lot of momentum to the environmental movement in all the different sectors. This was followed by governmental initiatives to regulate activities, leading to environmental degradation.

In the recent past, issues like the "Surat plague outbreak" brought awareness among people about environmental problems which are partially attended to by the civic authorities. In such a situation, it is important to look at the institutional set-up existing in the government for managing the environment at different levels. "Institutional set-up" or framework refers to the organizations and government departments directly or indirectly involved in handling the issues, and activities that lead to deterioration in the surrounding conditions. "The surrounding conditions" refer to the human being's immediate operational environment and the adverse impact of the developmental, industrial, and other activities on the environment. The effect most often has lasting impact on the people of the locality. The severity of a situation is decided by the extent to which environmental pollution affects the health of the inhabitants residing in the locality and the ecosystem, thereby producing further damages.

Environmental issues have assumed greater importance for the last two decades. After the United States Agency for International Development (US AID) canvassed its overseas mission in 1971 to identify the most serious environmental problems confronting the 35 African developing countries.

It concluded (USAID, 1974) that there was little evidence of awareness of environmental problems among the people of developing countries or among their government administrators. Many countries are preoccupied with the development of their natural resources, and to that extent, concern does exist for the environment, there is an apprehension that social and economic costs of environmental protection may far outweigh the benefits.

The most serious problems in Asia are urban environmental degradation, industrial pollution, atmospheric emissions, soil erosion, land degradation, deforestation, and loss of bio-diversity. These problems are caused by varied activities including: pollution from rapid industrialization and increasing energy use, land degradation due to deforestation, unsustainable agricultural practices, unsound watershed management and water resources, ecological damage attributable to large infrastructural projects, and loss of bio-diversity due to widespread developmental and population pressures. Environmental problems are crosscutting in nature, and impacts of activities in one sector often have cascading effects on other sectors too.

## 1.4. Environmental Problems

The major environmental problems are listed as follows;

- ✓ Intensive agriculturization including degradation of soils due to overuse of chemicals, fertilizers, and mono culture degradation of groundwater quality, increase in the use of pesticides leading to health hazards, and decline in the crop diversity. All these further aggravate the problems of degraded soil, the problem of pest and plant diseases, some of which have remained uncontrollable.
- ✓ Population explosion has further increased the pressure on natural resources such as forest and mangroves. Besides, the failure to realize the link between poverty and sustenance of environment has further aggravated the problems. All these factors has snowballed into major environmental problems, such as declining in forest cover increase soil erosion, silting of reservoirs and lakes and decline in bio-diversity, etc.
- ✓ Problems related to industrialization and urbanization.
- ✓ The lopsided development policies have resulted in degraded soil depletion of water tables, increased floods, desertification, water logging and salinity, pollution of water and air and loss of bid diversity.
- ✓ Adoption of less environment friendly technologies has resulted in air and water pollution, which has made most of our major rivers dirty.
- ✓ While the major industries are responsible for macroenvironmenta1 problems, the unchecked growth of informal manufacturing sector in most of the urban centers has spoiled the microenvironment.
- ✓ The concentration of coal mining, thermal power plants and fertilizer plants in the urban areas has led to serious problems with regard to air, water and land pollution.

## 1.5. Concept of Environment and Environmental Management

Environment as a term is very widely used and means different things to different people. It is used in management literature to refer to the external environment in which the organization functions. Ecologically, environment refers to the sum of all the external conditions and influences affecting the life and development of organisms (Webster, 1961). Two main aspects of the environment are biotic and abiotic (living and non-living organisms). Ecology is the study of the relation of the organisms to their environment. It is concerned with the biology of groups of organisms with

functional processes on lands, in oceans and in fresh waters. Environment refers to the region, surroundings or circumstances in which anything external to the organism exists.

The environment of the human being includes abiotic factors-land, water, atmosphere, climate, sound, odor, and taste; biotic factors-animals, plants, bacteria, and viruses; and social factors like aesthetics.

Environment refers to all the surrounding things, conditions, and influences affecting the growth or development of living things (World Book Dictionary, 1989). Environment as an area of study is thus a conglomerate of all basic and applied sciences, engineering, socioeconomic aspects, management and law. The environment of a region, country, state, district, city, and village is influenced by several factors, as there is a high degree of location specificity in the environment, on account of an all round diversity, ranging from ethnic, geological, geographical, climatic, and social considerations to economic and cultural circumstances.

The term human environment denotes those aspects of man's activities that by affecting the natural biological and ecological systems of man-of which he is a part-affect his own life and well-being.

To quote Lynton Keith Caldwell (United Nations Preparatory Committee on Human Environment), "Human environment is a matrix of elements derived by evolution through nature and contained by men through culture".

Environment, as the United Nations Committee describes, is the sum total of identified and identifiable natural resources, existing in finite quantities on earth and of the quality of the environment of the milieu, which constitutes an important element of the quality of renewable resources. "In generic sense, it is the aggregate of surrounding things, conditions, or influences. In specific sense, it is a thin layer of life supporting systems called biosphere, divided into physical and biological environment".

**Environmental pollution:** It is the reduction in the, quality of the environment due to disposal of the residuals. It refers to the presence of any substance in excess, which is harmful to the living beings, and hence termed as pollutants due to the ill effects of their presence.

**Environmental management:** Environmental management is the optimal utilization of the finite resources between different possible uses. Environmental criteria and economic considerations demand that such an allocation be efficient. Simultaneously, the available resources should be protected from degradation, and scarce and diminishing resources should be conserved. Environmental quality can be defined as the level and composition of the stream of all the environmental services except the waste receptor services.

**Environmental philosophy:** Environmental philosophy concerns itself with its evaluative and moralistic connotations as applied to the following relationships:

- ✓ Man and his biophysical environment/surroundings;
- ✓ Man and his fellow human beings as these relationships affect his thoughts and actions with respect to his biophysical surroundings;
- ✓ Within each of us as individual beings, as these notions influence our cognition and behavior.

**Environmental degradation:** It refers to increase in the air, water, noise and soil pollution that affects the quality of the environment.

## 1.6. Environmental Resources

- ✓ The physical environment provides all the resources necessary for life, including raw materials, energy, water, air, land and living resources (plants, fish, and animals).
- ✓ Most of the environmental resources are in the biosphere (life zone) of the earth-a 6-km thick layer on the surface of the earth-which includes the atmosphere.
- ✓ The economic view is that the natural environment is an asset or capital commodity that directly and indirectly provides man with economic benefits.
- ✓ Throughout history, societies have ensured their continued existence by adapting to the changing natural environment. Some societies have achieved considerable progress by adopting natural resource management methods, land-use planning, and pollution control and environment conservation measures.
- ✓ Growing world population and environmental exploitation impose an ever-increasing strain on natural resources. Resource supplies are not unlimited. Therefore, protection measures must include conservation resources and also be cost effective.
- ✓ Total world resources are never fully known. Every year new technology and new information systems provide new data on the resources.

Environmental resources were once classified as "free goods" in economics because they were available in abundance (e.g., water, air, land). They were used as common property for which no ownership rights are identifiable. These common property resources provide multiple services and functions. However, such "free goods" are now recognized as limited ones. Environmental managers aim at long-term management of natural resources and control of social and economic development processes which have environmental impacts. Limits to common property are prescribed in environmental standards, which can be voluntary or mandatory as enacted in environmental law (e.g., air quality laws, water management laws, etc.). These laws establish the responsibilities of government agencies for environmental protection, the liabilities of the polluters, and the means of enforcement.

Resources that the environment provides may be

- ✓ **Tangible:** Airflows, water, minerals, fuels, food, materials, etc.
- ✓ **Intangible:** Nutrient cycling, climate regulation and removal, dispersion, storage, degradation of residuals or wastes, and so on.
- ✓ **Aesthetic:** Scenic, recreational and other pleasing features.

Resources may also be either renewable or non-renewable. Renewable resources refresh themselves within a short time if properly managed (e.g., air, water, and land). Non-renewable resources, once used, are lost forever (e.g., minerals and oils).

Environmental functions are the vital link between the internal structure (management/worker) of the enterprise and the external, physical and social structure outside the enterprise. Thus, an enterprise, which ignores the impacts it is making on the environment, is headed for environmental conflict. As resource becomes more and more scarce, the potential for conflict

increases accordingly. Since prevention is usually much less costly than cure for the system as a whole (enterprise, community and the natural environment), each enterprise/system should devise an internal mechanism to prevent environmental degradation and potential conflicts

## 1.7. Environmental Conflict

Conflict results from the use of the resources and functions by one party at the expense of the other parties. It may also result from the overuse or abuse of environmental resources and functions.

Conflict between the enterprise and the community or government may result from incompatible values and goals or scarcity of resources. Successful environmental management internalizes environmental concern through measures taken at the decision-making stage. Recognition of environmental issues and the "actors" and their influence on economic, social and political factors is the first stage towards resolving conflicts. Once an enterprise has identified the resources and "actors" in an environmental conflict it can tailor its objectives to suit environmental conditions.

An appraisal must be made to discover whether resources are compatible with the needs of the enterprise. Then make an adaptation of enterprise goals (strategic fit) to the community's needs. The "opportunity cost" of delay in manufacturing operations may be significant. Thus, the avoidance of conflicts by management may save time and be highly cost effective.

Environmental Management is not “management of the environment”; it is the management of activities within tolerable constraints imposed by the government with full consideration of ecological factors. The objective is to meet basic human needs within the potential and constraints of environmental systems. Environmental Management introduces three new dimensions into traditional socioeconomic development. Namely:

- ✓ It broadens the concept in scope to include development and enhancement of environmental quality;
- ✓ It extends the concept of time to include sustainable long-term feasibility; and
- ✓ It assesses the costs to the society and the environment in achieving the desired balance between dimensions 1 and 2 mentioned above.

Environmental Management covers functions designed to facilitate comprehensive planning that takes into account the side effects of man's activities and thereby protects and improves the human environment for the present and future generations. (United Nations, Development and Environment, 1972)

Environmental Management also includes the preparation of plans and legal evaluation of administrative and technical solutions to various environmental problems in terms of both preventive and remedial measures, taking into account the multidisciplinary approaches to development. Environment Management is understood to mean prudent or optimal use, maintenance and enhancement of both the quantity and quality of national and local resources-primarily natural and mostly renewable such as land, water, air and forest, but inclusive of other resources as well, such as human, socio-cultural and institutional for purposes of "development"-or raising the quality of life of all the people in a given society (Ram Malhotra, 1990).

Besides these, Environment Management refers to all the systematic planned efforts by the policy makers/bodies, directed towards regulating and managing the utilization of natural resources and minimizing irreversible damages to the environment through all types of human activities. So the term, environment, is used here to refer to the immediate physical environment which serves as the base for drawing natural resources for all human activities into which flows the wastages of residential, industrial, developmental and similar other activities.

Thus the study of Environmental Management covers the conscious and planned efforts and activities undertaken by the government departments and agencies to minimize damages to the environment and meas4res undertaken to regulate the ongoing activities in different areas. Generally, the institutional framework that exists for managing the environment broadly refers to the government institutions, non-government institutions, and the other autonomous bodies functioning independently with a given set of roles and responsibilities, to fulfill certain objectives set forth by each, and, at the same time, collectively contributes to the overall objective of managing the environment.

**Impact of Environmental Management Decisions:**

- ✓ The enterprise and the community are part of one system; therefore, decisions must be taken by the community.
- ✓ Good environmental management looks at the potential consequences of actions before their implementation to assess their impact on the total system. In this way, decisions reached are balanced solutions for the enterprise as well as the community.
- ✓ Sound environmental management, which is cost effective since it achieves higher productivity through a more efficient use of energy and raw materials, increases workforce motivation (most of the workforce comes from the affected community), achieves enterprise goals of survival, growth and profitability, with limited community conflict.
- ✓ Environmental management is a series of compromises using limited resources to achieve multiple goals.

## 1.8. Environmental Accounting

Environmental accounting is a subset of accounting proper, its target being to incorporate both economic and environmental information. It can be conducted at the corporate level or at the level of a national economy through the National Accounts of Countries (among other things, the National Accounts produce the estimates of Gross Domestic Product otherwise known as GDP).

Environmental accounting is a field that identifies resource use, measures and communicates costs of a company's or national economic impact on the environment. Costs include costs to clean up or remediate contaminated sites, environmental fines, penalties and taxes, purchase of pollution prevention technologies and waste management costs.

An environmental accounting system consists of environmentally differentiated conventional accounting and ecological accounting. Environmentally differentiated accounting measures effects of the natural environment on a company in monetary terms. Ecological accounting measures the influence a company has on the environment, but in physical measurements.

## Need

There are several advantages environmental accounting brings to business; notably, the complete costs, including environmental remediation and long term environmental consequences and externalities can be quantified and addressed.

## Subfields

Environmental accounting is organized in three sub-disciplines: global, national, and corporate environmental accounting, respectively. Corporate environmental accounting can be further sub-divided into environmental management accounting and environmental financial accounting.

**Global Environmental Accounting** – It is an accounting methodology that deals areas includes energetics, ecology and economics at a worldwide level.

**National Environmental Accounting** – It is an accounting approach that deals with economics on a country's level. Internationally, environmental accounting has been formalised into the System of Integrated Environmental and Economic Accounting, known as SEEA. SEEA grows out of the System of National Accounts. The SEEA records the flows of raw materials (water, energy, minerals, wood, etc.) from the environment to the economy, the exchanges of these materials within the economy and the returns of wastes and pollutants to the environment. Also recorded are the prices or shadow prices for these materials as are environment protection expenditures. SEEA is used by 49 countries around the world.

**Corporate Environmental Accounting** – It focuses on the cost structure and environmental performance of a company.

**Environmental Management Accounting** – It focuses on making internal business strategy decisions. It can be defined as "...the identification, collection, analysis, and use of two types of information for internal decision making

- ✓ Physical information on the use, flows and fates of energy, water and materials (including wastes)
- ✓ Monetary information on environmentally related costs, earnings and savings."

EMA serves business managers in making capital investment decisions, costing determinations, process/product design decisions, performance evaluation and a host of other forward-looking business decisions.

Thus, EMA has an internal company-level function and focus, as opposed to being a tool used for reporting environmental costs to external stakeholders. It is not bound by strict rules as is financial accounting and allows space for taking into consideration the special conditions and needs of the company concerned.

**Environmental Financial Accounting** – It is used to provide information needed by external stakeholders on a company's financial performance. This type of accounting allows companies to prepare financial reports for investors, lenders and other interested parties.

## 1.9. Carbon Management

By tracking carbon footprint, or the overall impact businesses and organizations, have on the global climate in terms of the total amount of greenhouse gases produced organizations are making noticeable improvements. Carbon management allows companies to recognize areas for reduction in emissions and potential energy efficiency projects. Many organizations do not have a focused approach to carbon management. The greatest opportunities for carbon management improvements come from money-saving energy efficiency measures, making the investment in carbon management a valuable business practice.