Every waste that is prevented or turned to profit, every problem solved and every more effective process that is developed makes for better living in the material sense and for cleaner and more wholesome living in the higher sense.

Dr. Arthur Dehon Little, 1905

CHAPTER-1 INTRODUCTION

Economic Growth, its Effects on Ecology and Need for Sustainable Development

1.1 Meaning of Economic Growth

In simple words we can say that economic growth means a continuous and persistent increase in real per capita income from one point of time to another point of time. Over the years several efforts are made to accelerate economic growth. Three factors which have played a vital role in heralding the economic growth are technological inventions, process innovations and new ways of managing businesses. Hence, industries, agriculture and tertiary sectors have registered a remarkable growth.

1.2 Effects of Economic Growth on Ecology

This economic growth led to some **significant positive changes** in the world economy which are as follows:

1) Increase in national and household income
2) Growth of service sector
3) Demand for white goods
4) Improved standard of living and better quality of life.

However, today we realize that the journey of growth has a darker side as well. The world has paid a heavy cost for the growth. Various industries like oil, textiles, electronics, leather, automobiles etc. have been discharging

Industrial waste and is responsible for depleting the natural resources and generating pollution. In fact, pollution is increasingly increasing. It has significantly damaged our environment.

Some alarming situations being faced by us today are:

1. Continuous excessive use of natural resources by the industries.
2. Destruction of natural habitats along with urban development.
3. Excessive use of chemical based fertilizer for agricultural production.
4. Hazardous industrial wastes being disposed off in the rivers.
5. Air pollution rising at a faster pace due to emission of carbon products.
6. Global warming, ozone depletion and rise in temperature of the earth.

As cited in *Shrivastava's* book titled *Greening Business*, these problems are reaching levels where they threaten the stability and survival of earth's ecosystems. Corporations that own and manage industrial systems face enormous environmental challenges in coming years.[1] At present, if we analyze the current usage pattern of natural resources, they are being depleted faster than they can be renewed. Let us have a look on some major environmental crisis in the various industries around the world.

-Studies indicate that world oil supplies could be exhausted in next 30 years. Most of the other mineral resources could be depleted within the next century.

-Natural resources are extracted and forests are continuously being destroyed. Hence, it is extinguishing over 10,000 species of life each year.

-Excessive use of chemical based fertilizers weakens the soil and its fertility. Further, pesticides enter the food chain and harm humans and animals who consume the food. Various reports suggest that careless and excessive use of pesticides poisons more than 5, 00,000 persons annually.

-Media reports that the Bhopal disaster at the union carbide plant in India killed more than 3,000 people and injured 3, 00,000 more.

-Hazardous industrial wastes are another common source of environmental crisis. Waste discharged by various industries such as oil, chemicals, construction, electronics, leather, metals and mining, nuclear power, pharmaceutical, paper and pulp industries are contaminating land, water and air.

-Air pollution in well known cities of the world like México, Los Angeles, Delhi, London, New York City, Sao Paulo, Brazil, Lagos, Nigeria, Tokyo etc., is affecting public health.

-Worldwide emission of carbon products is about 5.5 billion tons per year. At the global level, air pollution from carbon dioxide and oxides of sulphar and nitrogen is suspected to cause acid rain, ozone depletion and global warming, a long term rise in the average temperature of the earth by trapping heat in the earth's atmosphere.

-Global warming can in turn raise sea level, drowning large parts of currently inhabited lands and cause changes in climate that are hostile to established patterns of world agriculture, animal farming, and human habitation. [2]

Thus, rising evidence of environmental problems such as the depletion the ozone layer, forest degradation, increased proportion of acid in river waters posed a major threat to the people and made them more concerned about environment. At the same time, a strong voice and organized efforts undertaken by various N.G.O's, legislative initiatives implemented by various governments and increased media exposure made public more aware and concerned about the environment.

The above discussion definitely throws light on environmental damage that occurred due to economic growth. As industries use resources of the nature on larger scale, its environmental significance is also on a larger scale.
Therefore, we need to bring changes in our growth pattern so that environment can be protected and damage to the nature can be minimized.

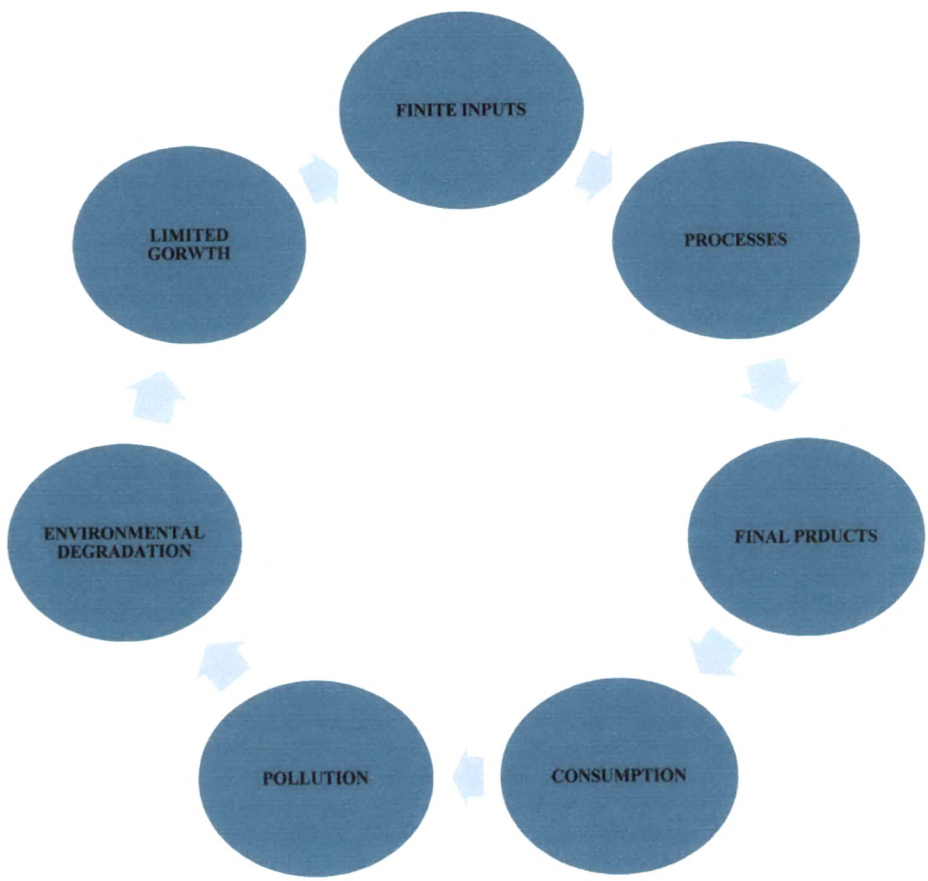
1.3 Need for Sustainable Development:

The world population has reached to 5.5 billion today and each year, world population grows by 85 million people. Less than one fourth of this population lives in affluent, industrialized western countries. Yet, these countries produce and consume nearly three-fourths of the world resources, and they generate nearly three-fourths of world's pollution and waste.

Now if we consider further growth in the world population then by 2030, it could reach to about 11 billion. By then, 84 percent of the world would be living in developing countries. Just providing basic amenities would require increase in world production and energy use up to 30 times of current levels. The current level of production already places an enormous strain on the environment. Imagine what a 30 fold increase in production would do! Imagine 30 times more pollution, 30 times more toxic wastes, 30 more Bhopals and Chernobyls would do to the world. [3]

Further, growth of industries is directly dependent on availability of finite natural resources. But, the natural environment has only limited ability to deal with pollution and degradation. Agriculture, metals and mining, oil industry, dairy, food processing, forest products etc. are greatly dependent on availability of natural resources.

Figure-1.1



A flow showing pollution and limited growth

Thus, it is important to note that the present growth pattern has its own limitations as natural resource availability is finite. Secondly, pollution generated by the industries depletes the natural resources. Therefore, growth pattern should be such that it leads us towards environmentally sustainable development. It calls for using natural resources more sensibly and economically and waste should be minimized.

Further, consumers today are also showing strong concern for resource depletion and environmental degradation. Organizations will have to become more sensible and sensitive to understand, how this damage to nature influences a consumer's attitude towards various products, their tastes, preferences and brand choice. After taking these inputs, the organizations should design their marketing strategies. This will enable organizations to hone its competencies and will enable them to lead the markets not only today but even tomorrow.

The best example who has implemented this is the case of Procter & Gamble. It used the information that U.S. households spend 3% of their electricity budgets to heat water for washing their clothes. If they switched to cold water washing, they would consume 80 billion fewer kilowatt-hours of electricity and emit 34 million fewer tons of carbon dioxide. The Company made a priority to develop cold water detergents and in 2005, Procter & Gamble introduced Tide cold water in U.S. and Ariel cool clean in Europe.[4] Thus, sustainable development is inevitable in 21st century and corporate greening has to be undertaken for long-term survival.

As *Shrivastava* argued "only with corporate greening can corporations- the main engines of economic development be made ecologically sustainable.[5] Organizations now will have to take a wake up call. They must introduce ecologically sound initiatives and practices, which are essential for its survival and further growth.

1.4 Sustainable Development Defined:

Sustainable development is development that is conscious of limits of the natural environment to support growth. It moderates the rate of use of natural resources, and attempts to renew these resources. It is development that does not jeopardize the ability of future generations to meet their own needs.[6]

It means that growth efforts should be accelerated in such a way that it takes into account finite availability of natural resources as inputs, identifies new ways of renewing these resources, so that growth can be sustained and future generations can fulfill their needs. Here, it should be noted that sustainable development does not mean halting the growth. It calls for developing and adopting an alternative growth pattern which can protect the diversity and richness of natural resources, can conserve the non-renewable natural resources and uses them sensibly and economically. In short, growth strategy must revolve around *"renew, reuse and recycle" of the resources.*

As rightly mentioned in "*Greening Business*", sustainable development questions growth strategies that are energy intensive, that deplete non-renewable resources, pollute the environment and generate excessive amounts of toxic waste. It challenges corporations to create an alternative form of sustainable growth. [7]

Let us understand that the consumers are the end users of all natural resources. To avoid resource depletion, they need to reassess their consumption habits and buying preferences which can push industries to go for developing greener products. However, corporations must take a lead in green initiatives as they are the growth engines in a given economy and can play an important role in resource conservation. In fact, the long term survival of many industries, including agriculture, metals and mining, forest products and oil depends on the sustained availability of natural resources. Corporations, thus have a special responsibility for protecting these resources.

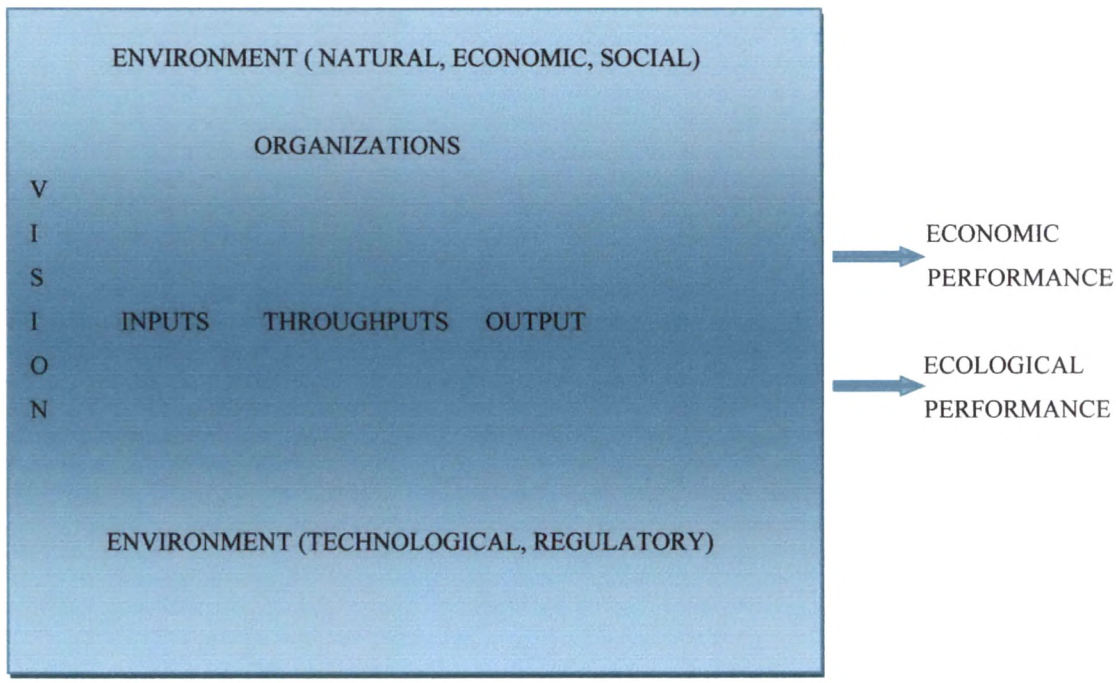
1.5 Creating a Sustainable Organization

Organizations use energy and natural resources as inputs. With the help of a given technological systems and processes, inputs are converted into final products and along with this organization also discharges waste. Corporations seek to meet the multiple and conflicting goals of profitability, growth, competitiveness, and stakeholder demands.[8] It means that these competing goals need to be achieved in such a way that it can bring profit as well as satisfies stakeholder demands.

Here, it is important to discuss and analyze important elements called VITO (Vision, Inputs, Throughputs, and Outputs) which have the power to minimize the negative impact of corporate activities, as suggested by *Shrivastava Paul*.

Figure 1.2

Organizations as Vision, Inputs, Throughputs, and Outputs (VITO)



(Source: *Paul Shrivastava, Greening Busines*)

"Creating sustainable corporations requires addressing all VITO elements to minimize the environmental and health consequences of corporate activities". [9] Here, corporations need to re-examine what is their vision and mission, as ultimately this will determine actions of the organization, product strategies, technologies etc. Corporations have been ignoring the nature, and their focus is on economic interest but environment is neglected. "There is great potential for changing this traditional vision to support genuine ecological sustainability. Organizations should adopt eco-centric vision which will transform its entity from economic to ecological and social entity. It would treat nature as an important stakeholder and should treat its employees not simply as labor, but as complete persons". [10]

Hence, organizations today have ample opportunities to minimize pollution, product hazards, and wastes by developing environmental friendly products, packaging, and green advertising. Organizations can save money by being eco centric and by developing green solutions. It will fetch economic benefits to the organization and will protect the environment. Thus, win-win situations can be achieved.

How to promote Sustainable Development in the organization:

1. Transformation of organization from economic entity to ecological entity.

2. Create environmental management systems and policies.

3. Design environmental friendly strategies, products, operation systems and waste management practices.

4. Develop technologies that minimize the pollution and invest heavily in research and development of projects dealing in environmental protection.

5. Develop a network with ecologically oriented non government organizations, create tie-ups with agencies which promote awareness on environmental issues.

As *Shrivastava* argued, if corporations continue along the environmentally exploitative paths of the past, soon there will not be much left to exploit. The power of the idea of ecological sustainability lies in the opportunities it opens up. It does not resist growth per se. It challenges us to look for ecologically sound forms of economic development.[11]

Hence, sustainable economic growth is the only viable option we have. Let us have a look as to how pollution prevention programmes are executed and how they have minimized the waste.

1.6 Companywide Pollution-Prevention Programs: Few Examples

1) **Environmental program at AT&T**

Company used a BIOACT solvent derived from citrus fruits and other organic compounds to clean its electronic equipments. It eliminated CFC use in circuit board manufacturing process through use of the AT&T low solid fluxer.

2) **General Electric Pollution, Waste, and Emissions Reduction Program (POWER, 1989)**

At its Louisville plant GE has reduced its production of hazard wastewater-treatment sludge as high as 95%. At GE Plastics' Ottawa plant it has reduced its butadiene emissions by more than 90%. GE Medical Systems' E. Dale Trout plant has reduced its generation of hazardous waste by 74%. Business wide, GE Power Delivery has reduced its CFC usage by 72% and companywide, GE has reduced its SARA 313 reported releases by 11% in the period from 1987 to 1988.

3) **Goodyear Toxic Air Emissions Reduction**

At Goodyear toxic air emissions were decreased from operations by improving maintenance and monitoring of equipments and through decreased use of acrylonitrile, butadiene and styrene

4) **IBM Hazardous Waste Generation**

Company pledged to eliminate ozone depleting chemicals from its products and various processes. Further, company also kept an ambitious target of recycling 50% of its solid waste. It accomplished its targets reasonably well.

Its hazardous waste was reduced by 38% from 1984 to 1988. Similarly 84% of its hazardous waste was recycled. At IBM US 28% of all solid waste and 20% emissions were reduced during 1987-88.

5) Xerox

At Xerox by substituting d-limonene for chlorinated solvents, it reduced the amount of solvents emitted to the atmosphere from about 200,000 lb in 1982 to an estimated 17,000 lb in 1990. Further, a High-pressure water strip operation has enabled Xerox to recycle 800,000 lb nickel and 2 million lb of aluminum tubes per year, and to return 160.000 lb of selenium to suppliers for reuse. [12]

The above cases indicated the economic benefits derived by corporations by implementing pollution prevention programmes. It can be practiced in any other organizations also, by bringing new waste reduction ideas and implementing them. Today, it is the economic as well as ecological performance of the organization that will determine its operational effectiveness and competitive advantage in the industry.