

## ENVIRONMENTAL DEGRADATION – ITS CHALLENGES AND PRIORITIES

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Environment, economic activity and human society are related to one another. In other words, the interrelationship between environment, economic growth and society is inherent that each one of them affects the other. Economic activity affects the environment in several ways. Without adequate environmental protection, economic growth will be undermined; without growth environmental protection will fail. Essentially environmental problems are associated with renewable resource use for production of goods and services. But, rapid economic growth has been resulting in the danger of exhaustion from excessive use of renewable resources. Industrial development has been associated with air and water pollution, excess reliance on chemicals, noise pollution etc.

The magnitude and intensity of environmental degradation faced by countries vary with their stage and level of development, the structure of their economies and their environmental policies. The global environmental problems include the emission of carbon dioxide, depletion of atmospheric ozone, acid rain and hazardous wastes. But, the crucial environmental problems faced by the developing countries are unsafe water, inadequate sanitation, soil depletion, indoor smoke from cooking fires and out door smoke from coal burning.

Developing countries that are agrarian and biomass-based existence have experienced large-scale soil erosion, water quality deterioration, deforestation, loss of grazing lands and declining soil productivity. Perhaps, this is due to limited access of developing countries to low cost polluting technologies and failure to protect tropical forests and of biodiversity. As a result, many developing countries have been experiencing the problems of global warming and ozone depletion.

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There is a consensus that problems of environment have reached a higher levels that immediate and concrete measures need to be taken by all countries and global community to check further deterioration in environmental balance. This view underscores the spirit of the World (Brundtland) Commission on Environment and Development 1987 and the commitment of almost nations for sustainable development flowing the Earth Summit in Rio in 1997.

## Major Challenges

The major challenges to the planners and policy makers in developing countries are to achieve rapid economic growth by maintaining environmental balance. This task calls for strict control over the factors that affect economic growth and preservation of environmental wealth for future generations. Further, it requires clear understanding and assessment of the consequences of environmental pollution and identifying the priorities for policy execution without jeopardizing the objective of development.

### 1. Growth of Population

Rapid growth of population has been contributing to the rapid environmental degradation in the past. It is estimated that during 1990 – 2030 the world's population is likely to grow by 3.7 billion, an increase much greater than in any previous generation and ninety percent of this increase will occur in developing countries. The land and resource management efforts are unable to adapt fast enough to prevent the over use of these resources. Ever increasing urban population and density of population have resulted in a phenomenal increase in the slums and poor men colonies that have become the challenges for environmental management. It is estimated that in India urban population may equal the rural population by the end of next two and a half decades. The distribution of people between countryside and town also has important implications for the types of stress placed on the environment.

Countries with population explosion can experience the mutually reinforcing effects of poverty and environmental degradation. Some countries have experienced faster conversion of land to agricultural uses, putting additional pressures on land and natural habitat. In some other countries farmers are forced to resort to cultivating erosion-prone hillsides and move into tropical forest areas where crop fields on cleared fields usually drop sharply after just a few years. This encouraged land degradation and deforestation. Further, increase in the poor

families prompted them to excessive cutting of trees for firewood and failure to replace soil nutrients. Sub-Saharan Africa is in the grip of agricultural stagnation and a steep decline in the area under forests.

## 2. Economic Growth

The earth's "resources" (production) are limited and places constraints on the human activity to produce goods and services. However, under the production trends developing country output would rise by 4-5 percent per year and by the end of 2030 it would be five times what it is today. In other words, economic growth places heavy pressure on environment and may step up environmental degradation in the same rate. It is estimated that the potential supply of resources such as metals and minerals has been outstripping demand causing serious ecological imbalance. In contrast, demand for water has been exceeding supply not only in the arid areas but also in many areas resulting in steep depletion of aquifers, some times irreversibly, and extraction from rivers is often so great that their ecological functions are impaired and further expansion of irrigation is becoming severely limited.

## 3. Droughts and poverty

The combination of drought and poverty causes serious environmental degradation that threatens future agricultural productivity and the conservation of natural resources. Generally, plants, trees and wildlife are under stress from drought. Poor people in these areas are induced to cut and diffuse wood, edible plants and wildlife that aggravate deforestation and degrade soil quality. Many farming practices in semiarid areas have been harming the quality of land and the availability of water resources. Failure of wells and bore wells intended for irrigation in drought areas make the soil more vulnerable to drought. Livestock farmers tend to concentrate their animals near the water holes and the consequent overgrazing may cause permanent damage to the pasture and long-term damage to the soil.

## Consequences of Environmental mismanagement

Until the beginning of last decade too little attention was paid to the maintenance of environmental balance and to the problems of clean water and sanitation, urban air pollution, indoor air pollution and severe land degradation. This resulted in severe damage to environment

that has three types of potential effects on the present and future human welfare. Human health was harmed, economic productivity was reduced and the pleasure of 'amenity' or recreation value was lost. The consequences of environmental mismanagement are grouped under the followed categories:

#### **a) Water Pollution**

Where industry, mining and the use of agricultural chemicals are expanding rivers become contaminated with toxic chemicals. Decomposition of these pollutants lowers the capacity of rivers and streams to support aquatic life and causes serious threat to the survival of fisheries. During 1980s mercury and lead metals became a problem in rivers of Brazil and Turkey. This forced the towns and cities to turn to ground water as a potential source of a cheaper and safer supply of drinking water. Excessive use of ground water resulted in the depletion of aquifers and placed severe constraints on economic activity. Scarcity of potable water placed crushing burden and waste of time to rural households and heavy costs on the municipal corporations to supply drinking water from distant places.

It is estimated that more than 2.00 million deaths and billions of illnesses a year attributable to water pollution, poor household hygiene and added health risks caused by water scarcity. Unsafe water is implicated in many cases of diarrheal diseases, which kill more than 3.00 million people, mostly children, and cause about 900 million episodes of illness each year. Sewage contamination of seafood is thought responsible for a serious outbreak of hepatitis.

#### **b) Air Pollution**

Air pollution has three principal man-made sources-energy use, vehicular emissions and industrial production that are expanding with economic growth. It is estimated that, with the present growth in demand for vehicular transport electricity emissions of the main pollutants deriving from these sources would increase five times and eleven folds by 2030. Excessive urban particulate matter levels are responsible for acid rain on forests and water bodies that affected the health of people. It is estimated that air pollution causes 3.00 to 7.00 lakhs deaths and half of childhood chronic coughing. Studies that have measured biomass smoke in household kitchens in poor rural areas have found suspended particulate matter are exceeding

several folds. It is also estimated that 400 million to 700 million people, mainly women and children in poor rural areas are affected by smoky indoor air.

### c) Solid and hazardous Waste

Seepage from the improper use and disposal of heavy metals, synthetic chemicals, and other hazardous wastes causes ground water pollution. It is estimated that in Latin American countries the quantity of such compounds reaching ground water from waste dumps is doubling every fifteen years. Industrial growth has been contributing significantly to the increase in the volume of toxic wastes affecting the health of the community. Discharge of solid waste polluted the aquifers and ground water resources affecting the health of the community. Rotting garbage and blocked drains spread diseases in the society. The risks from hazardous waste are typically local but acute.

### d) Soil Degradation

Cropping in marginal rainfall areas exposes soils to wind erosion. Soil degradation is common on tropical soils while off site siltation of reservoirs and river transport channels is common in coastal areas. Soil degradation occurs in the forms of desertification, soil erosion and salinization or water logging. Sand engulfing pastures and agricultural land is a serious problem in dry land areas of drought prone zones. Gradual deterioration of soils in dry land areas in the form of loss of vegetative cover and plant diversity are attributable partially to droughts and partially to human activity. UNICEF sponsored Global assessment of soil degradation show that almost 11.00 percent of the earth's vegetated surface has undergone moderate or worse soil degradation over the past half century because of human activity.

Soil erosion harms productivity by depositing silt in dams, irrigation systems, and river transport channels. The annual economic loss agricultural productivity estimated in the developing countries is about 0.5 to 1.5 percent of the Gross Domestic Product. Most of salinization and water logging of irrigated areas occurs naturally and to some extent by bad irrigational practices and are eating away the productivity of irrigated investments. It is estimated that globally nearly one third of arable land is affected by elevated salt concentrations and nearly one quarter of all irrigated land suffers from salinization caused by bad irrigation practices.



#### e) Deforestation

Forests protect and enrich soils, regulate hydrologic cycle, affect the climate, influence watershed flow of surface and ground water and help stabilize global climate. Farmers, logging and mining companies and fuel wood collectors cause deforestation. Small farmers in Central America, Central and East Africa and South Asia are often involved in the conversion of forests in to agricultural lands. It is estimated that nearly 60.00 percent of the annual clearance of tropical moist forests are mostly lost to agricultural settlements. Tree cutting for fire-wood accounts for largest share of wood use in developing countries and it leads to loss of biodiversity and ecosystems that affect the local people.

#### f) Loss of biodiversity

Biodiversity relates to a composite of genetic information, species and ecosystems and provides material wealth in the form of food, fiber, medicine and inputs into industrial process. Elimination of pollinating birds and insects, and important food plants can fundamentally and unpredictably alter the balance of particular ecosystems. The disappearance of important herbal plants aggravated the loss of new drugs. The removal of large herbivores can cause vegetation cover to close-up, thus restricting or eliminating the habitat of small herbivores.

#### g) Atmospheric changes

Some of the environmental threats will have their adverse effects in future that are uncertain and cause irreversible hazards to future generations. Such threats impose the risks of climatic natural diseases that affect the health of larger proportion of the population. Greenhouse warming and ozone depletion are the two important threats that cause atmospheric changes.

- (i) **Greenhouse Warning:** The earth's climate is driven by solar radiation. In the long term the energy absorbed from the sun must be balanced by outgoing radiation from the earth and the atmosphere. To maintain the global energy balances, both the atmosphere and the surface will warm until the out going energy equals the incoming energy. But, part of this outgoing energy is absorbed and re-emitted by radiative atmospheric gases (greenhouse gases) thereby reducing the net emission of energy to space. This is the greenhouse warming. Natural greenhouse gasses are water vapour, carbon dioxide methane, nitrous oxide, and ozone, and the man-made greenhouse gases include many ozone depleting substances-important one is

chlorofluorocarbon (CFC). These gases differ in their heat trapping and in their ability to affect the radiative balance of the earth. Manmade CFC and nitrous oxide are many times more potent than carbon dioxide.

Human activities of using fossil fuels is emitting large quantity of carbon dioxide and biomass burning, coal mining are emitting methane and use of fertilizers are emitting Nitrous oxide that absorb the outgoing energy from the earth to space and thereby contributing to global warming.

- (ii) **Ozone depletion:** ozone (oxygen layer) depletion is mainly the result of increasing atmospheric concentrations of chlorine originating from CFCs. An important consequence of ozone depletion is an increase in solar ultraviolet radiation received at the earth's surface. Exposure to the sun's rays would mean an increase in nonmelanoma skin cancers and an increase in eye damage from cataracts. It is estimated that 3.00 lakh skin cancer diseases and 1.70 million cases of cataract diseases a year are attributable to ozone depletion.

### Environmental Priorities

Environmental problems are widespread and all countries face multiple environmental problems and hence governments must set priorities and formulate policies to mitigate their effects. In developing countries highest priority must be given to environmental impacts on health and economic productivity. Actual priorities will depend on the level of development, structure and nature of the economy and the level and distribution of income in the country. In highly urbanized countries management of air pollution and air pollution will be given top priority and in highly rural economies like India land, water and forest management may have top priority.

People mainly the wealthiest and most politically powerful members of the society have been enjoying the benefits from the use of environmental resources (mines, forests) paying less for them. Taking away their rights to pollute or to exploit resources can be politically painful and will often require compromises and governments face many pressures in making environmental policy. Conflicting interest groups lobby noisily, public opinion demands action on the most dramatic rather than the most important issues and governments find it difficult to curb their own damaging behaviour. However, all countries have their set of priorities and formulated policies to arrest or prevent environmental degradation any further. The following

set of priorities needs to be considered in the formulation of environmental policies in a developing country like India.

1. to ensure good quality and availability of drinking water and sanitation facilities,
2. to restrict the vehicles from the use of fuels containing pollutants, especially particulate matter and lead, in urban areas,
3. to restrict the industries from discharging toxic chemicals and heavy metals in rivers and lakes,
4. to restrict the burning of biomass in rural areas to control indoor air pollution
5. to restrict people from indiscriminate cutting of tree, timber and other forest plants,
6. to restrict the excessive use of fertilizers and pesticides that affect the soils and their productivity, and
7. to control the growth of population and promote the quality of human resources by providing education and health facilities in rural areas

### **Measures to Check Environmental Degradation**

In view of these priorities the following measures may be implemented by the developing countries like India to check environmental degradation and ecological imbalances.

To reduce the pressure of growing population incomes of poor households must raise, child mortality must decline, educational and employment opportunities must expand and access to family planning services must be increased. Additional annual expenditure on family planning programmes is to be incurred to achieve rapid fertility decline scenario.

To reduce the effects of water pollution seepage from improper use and disposal of heavy metals, synthetic chemicals and other hazardous wastes are to be controlled. Construction of sewerage systems and proper maintenance of septic tanks in urban areas is to be ensured. Intensive agriculture combined with irrigation that relies on the use of chemical inputs is to be discouraged.

To reduce soil erosion low cost techniques for balanced management of soil moisture, nutrients and organic matter are to be adopted. To reduce surface runoff of water, sediment loss, and erosion by 50.00 percent, compared with traditional cropping methods, mulching, manuring, low tillage, contour cultivation and agro-forestry practices are to be employed.



To control deforestation strict management practices that include highly selective cutting or replanting make it possible to pursue commercial logging without sacrificing the forest services. Concerted efforts are to be made for intensive reforestation including social forestry.

To control air pollution in cities and towns and to protect the people from vehicular emissions, legislation may be enacted leading to changes in the design of engines, in emissions control devices, and in the type of fuel used. Further differential taxation on leaded and unleaded gasoline, fuel price surcharges based on the sulfur content of diesel fuel, and lower rates on clean fuels such as compressed natural gas (CNG). To reduce outdoor pollution from household fuels a shift from the use of biomass to oil, gas, electricity etc., is to be encouraged.

To control industrial pollution environmental control measures such as forcing cement and mining industries to install dust control systems that check emission of dust, insisting the chemical and pulp industries to separate the biodegradable and non-biodegradable emissions etc., are to be implemented in industrial cities and towns in the developed countries using the technologies available for this purpose.

Electric power generation from fossil fuels is to be minimized and the under pricing of electricity and subsidized supply of electricity to industrial use is to be checked to control air pollution in cities and towns.

New environmental provisions need to be integrated into existing government procedures or into traditional local law. Regional and local environmental units are to be allowed to implement and monitor and feed information back to the national governments. In rural areas resource analysis and planning should be done at the level of the individual watershed or irrigation schemes. In cities the management of air and water pollution requires a strong mechanism for inter-sectoral planning and coordination.

Poverty, uncertainty and ignorance are the allies of environmental degradation. Addressing these problems is therefore the first requirement of effective environmental policies.

Community will support the environmental programmes that reflect the local beliefs and values. Participation of the local people help with afforestation, wildlife conservation, part management, improvement in sanitation systems and drainage and flood control. Local people can provide the manpower and knowledge for dealing with the aftermath of environmental diseases, and local knowledge of genetic diversity has led to break thoughts in crop production.

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