

## Review

# Environment in Crisis

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**There are some uncertainties as to what effects a change in environment might have on the earth. The environment is our basic life-support system. Over the last two decades our reliance on the environment has been graphically displayed in series of some major environmental disaster. To fulfill our needs, there has been discriminate or unwise use of natural resources. That's why, many parts of the environment have been badly damaged. If we continue to treat the environment as we have done up to now, the damage will get worse, the costs higher, and the consequences more serious. There are a number of factors responsible changes. The most prominent one is the industrial revolution. Consumerism (our increasing want for material things) has increased by leaps and bounds, creating mountains of waste. Our population has increased to an incredible extent. There are several challenges and they can be classified as economic, institutional, psychological, and informational. The threat of global environmental problem is growing. However, the actions must be carried within a sustainable and equitable development framework. The paper discussed several options but implementing them requires detailed analysis to ensure that national benefits are maximized. The importance of local control and management cannot be over-emphasized in ensuring sustainable development.**

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## INTRODUCTION

The environment is our basic life-support system. It provides the air we breathe, the water we drink, the food we eat and the land we live on. We totally rely on the environment to provide us the above mentioned facilities. To fulfill our needs, there has been discriminate or unwise use of natural resources. That's why, many parts of the environment have been badly damaged. If we continue to treat the environment as we have done up to now, the damage will get worse, the costs higher, and the consequences more serious. Under this circumstances, interest in the environment has grown a great deal since the early 1970, initially mainly amongst scientist but more recently increasingly amongst the general public. Over the last two decades our reliance on the environment has been graphically displayed in series of some major environmental disaster – like the nuclear accident at Chernobyl in 1986 and the mounting problems of air pollution by

greenhouse gases. The general public has woken up to the possible environmental impacts of its own actions and we now understand that it is our problem, not someone else's (IPCC, Climate Change, 1992).

By the late 1990 the key environmental problem included the greenhouse effect and global warming, the hole in the ozone layer, acid rains and the destruction of forests. The problems appear to be largely environmental, the causes and solutions lie much more in people's attitudes, values and expectations. Unfortunately the environment can not meet all the needs at the same time.

## Symptoms of the environmental crisis

Humankind seems to be the only species that knowingly continues to foul its own nest. Many of the

problems stems from the interactions between people, resources and pollutions. A complete list of what we are doing wrong, and where we are going wrong would be enormous and it would touch upon just about every aspect of modern day life. Some of the more obvious symptoms of the crisis are (NRC, 2008):

1. Population increase, that has increased eightfold since the start of the industrial revolution;
2. Resource use, that has risen by more than 100 times during the twentieth century;
3. Habitat clearance, that is in less than 200 years more than 6 million square kilometer of forest have been removed (Deforestation);
4. Air pollution;
5. Ozone layer depletion;
6. Water pollution and Water Resources;
7. Soil erosion and Conservation;
8. Global Warming;

### Population

Another critical part of the equation is population pressure. It is clear that the evolution of the earth's atmosphere has been intimately linked with the development of life on earth. Today both biological and geochemical processes are involved in maintaining its composition, but one species, human, has now become so numerous that it is beginning to affect the composition of the atmosphere and shift it from its natural equilibrium. There are simply too many people expectation too much of the earth's environment and resources, and numbers continue to grow (Wagner and Richard, 1971). World population doubled between 1950 and 1987, reaching 5000 million. Two more people are added to the world total every second. By 2025 the United Nation predicts a global population of 8200 million with nine-tenths of the growth concentrated in developing countries. By 2050 the planet will have to support an estimated 10,000 million people.

But it is not just the total number of people that matters; it is their distribution spatially in relation to access to resources. The 26 per cent of the world population who lived in the developed world consume 80 per cent of the commercially produced energy, up to 86 per cent of the metals and up to 34 per cent of the food.

Scientist believe that enough is grown each year to feed the world's 5000 million people, but there is widespread hunger because inequitable distribution of land and wealth. A fifth of the world's population (950 million) are permanently hungry, and many of them live in South Asia and Africa where population growth rates are particularly high.

There are gross inequalities in health, wealth and quality of life between the have's and have-not's in the

world too – hundreds of millions of people struggle in poverty with no real quality of life, one person in five can not get enough food to support an active working life, a quarter of the world's people are without safe drinking water, and millions of children die every year from malnutrition and preventable diseases.

### Reckless exploitation of resources

Present day economic growth model are based on consumption. For most part of human history the planet's resources have been treated as nature's bounties with no price tag what so ever attached. The result has been the overuse of resources. The developed countries with their culture of materialism and consumerism are using most of planet's resources (WRI, 1993). That is why they rich. The biggest contributors to greenhouse gases and acid rains are the developed countries whose economies are structured to keep the standards of living extremely high.

The developed countries on the other hand, are short of resources. They are being told every day to put restraint on the use of resources. The developing countries complain that this will inhibit their economic growth that is so essential for their survival. The difference in approaches of the rich of north and poor of south towards the environmental issues has polarized the international relations. Affluence is as much a cause of environmental degradation as poverty.

### Deforestation

One of the most serious environmental problems today is the continued destruction of forest of different regions of the world. Some four-fifth's of the forest area is cleared for farming and most of the rest is selectively logged. Although, the tropical forests cover only about 6 per cent of the world's land surface, they are an essential part of our life support system. Tropical forest is perhaps the most important biome in the world, but it is also the most seriously threatened one. Ecologist are concern at the pace and pattern of clearance of tropical forest, which once covered about a tenth of the earth's surface (WRI, 1993). More than 40 per cent of the tropical forest has been cleared since the 1940, and clearance continues at a rate of about 200,000 square kilometer a year. Less than 1 per cent of the Brazilian Amazon had been cleared before 1975, but between 1975 and 1987 the rate of clearance increased exponentially (IPCC, Climate Change, 1992).

Overall, about a quarter of the loss is due to forestry, but the balance of factors varies from place to place. Clearance is promoted by many different factors, including:

- 3.1 Over-intensive shifting cultivation;

- 3.2 Lumber extraction;
  - 3.3 Over-collection of fuel wood for cooking and heating, and for making charcoal;
  - 3.4 Encroachment and clearance by landless peasants;
  - 3.5 Clearance for pasture or crops, promoted by cheap land prices and government tax and financial incentives to encourage international investments;
  - 3.6 Road and highway construction.
- Ecologists argue that if clearance continues at recent rates, all of the world's primary forest is likely to disappear or be damaged by the year 2020. This would mean the loss of an irreplaceable biological asset as well as a significant loss of biodiversity. But the cost is not just ecological: forests also provide invaluable environmental services by helping to regulate:
- Global weather pattern;
  - Soil erosion;
  - River flooding; and
  - Greenhouse effect.

Thus, it is necessary to take various attempts to conserve the remaining forests to maintain the sustainable environmental scenario.

### **Air pollution**

The term 'air pollution' is used to describe substances that are artificially introduced into the air. Air pollution is the contamination of the atmosphere with the substances which, because of their nature or quality can not be absorbed by natural environmental flows and cycles. There are a number of important sources of pollution. A variety of natural resources release substances that can locally overload the atmospheric system, including dust, gases and aerosols from volcanic eruptions, forest fires and sea spray. The natural pollutants are much less of a problem than pollution caused by human because (Bach and Wilfred, 1972):

- They do not release material that can not be recycled in the biogeochemical cycles;
- They tend to be short-term problems (such as the dust released from the Mount Pinatubo volcanic eruption in 1991);
- They tend to be released from particular places (point sources);
- They are really part of nature.

The term 'pollution' is usually applied to substances released into the atmosphere as a result of human activities, which can be either deliberate; such as the continual release of gases from chimneys or accidental, such as the release of radioactive material from the damaged Chernobyl nuclear power station in 1986.

Some air pollution involves the release into the atmosphere of toxic substances i.e. Toxin Carcinogen, Teratogen, Mutagen etc. Many toxic substances pose problems because they are persistent, mobile and harmful to people and wildlife. Not all air pollution are toxic, but even those that are not, can cause damage to people and wildlife, because they are released or deposited in abnormally high concentrations. Many industrial cities around the world, particularly those with old heavy industries like iron and steel works, smelters and chemical plants and those where coal-burning is still a principal source of space heating and electricity generation are surrounded by vegetation, deserts. Air pollution is seriously affecting rates and patterns of weathering of building structures and historical monuments in many places.

### **Local air pollution**

In the past most air pollution was concentrated in particular places, such as around large cities and industrial areas, and most ecological damage was centered on the areas of high fallout relatively close to the emission sources. For example, air pollution disaster in London (1952) showed that extremely high levels of particulate based smog could produce large increases in the daily mortality rate and killed an estimated 4000 people. Recent studies in different countries have shown that variations in the amount of Sulphur dioxide (SO<sub>2</sub>), Nitrogen Oxide (NO) and dust in the air depend mostly on space heating, whereas Nitrogen dioxide (NO<sub>2</sub>) depends more on traffics. It has also shown links between variation in particulate air pollution and daily death rates from lung problems and hospitalization.

### **Regional air pollution**

As some industrial areas and cities grew and spread out, air pollution became regional environmental problem in some areas - such as around heavy industrial areas in eastern and Western Europe, Japan. The former Soviet Union was among the world's heaviest producers of air pollution, partly because of a continued reliance on coal-burning, iron and steel production and other traditional heavy industries.

### **Global air pollution**

A major concern towards the close of the twentieth century has been the growth of global air pollution. Global air pollution requires delayed monitoring, so that scientist can determine what is happening and where it is happening, how fast atmospheric equilibrium is being

changed, where the problems exist and are likely to arise, and how close the critical thresholds important to environmental systems might be. Problems such as depletion of stratospheric ozone, development of photochemical smog and acid rain involve complex chemical chain reaction within the atmosphere, not all of which are fully understood, and which require more scientific study.

Global air pollution also requires careful management if many important environmental systems on which life on earth depends heavily are not to be further damaged, and particularly if they are not to be damaged beyond the environment's inbuilt ability for self repair and recovery. It also has many implications for natural resource planning, because the sustainable use and fair allocation of natural resources is difficult enough on its own, but it is made doubly difficult if resource managers are chasing the moving target of progressive long-term climate change too.

Because the atmosphere is so dynamic and mobile, material within it can be dispersed across a wide area very quickly so that places a long distance downwind can be seriously affected. This is how trans-frontier air pollution is created, because air movements respect no political or administrative boundaries and spread pollution to countries downwind. A classical example was the fallout of radioactive pollutants from Chernobyl across Europe in 1986, within a week of the accident some fallout from Chernobyl was traced across the Atlantic, in parts of the north-west USA.

### Ozone layer depletion

The distribution of ozone in the stratosphere is a function of altitude, latitude and season. It is determined by photochemical and transport processes. The ozone layer is located between 10 and 50 km above the Earth's surface and contains 90% of all stratospheric ozone. Under normal conditions, stratospheric ozone is formed by a photochemical reaction between oxygen molecules, oxygen atoms and solar radiation. The ozone layer is essential to life on earth, as it absorbs harmful ultraviolet-B radiation from the sun.

In the upper part of the troposphere or lower part of the stratosphere (15-20 Km. above the earth surface) lies a thin layer comprises of ozone. Ozone layer can be regarded as a thin film which has the ability to absorb solar photons in the spectral region call the 'near ultraviolet'. The ozone layer is a natural filter. Without this layer, these photons would reach the earth's surface. These photons are sufficiently energetic to disrupt the structure of complex, fragile molecules, specially the molecules of living organisms. In fact, it is believed that life could not have emerged from the sea until an ozone layer had formed. It is feared that any diminution in this layer would produce

disturbances in ecological balance, along with a significant increase in the incidence of cataracts and skin cancers (IPCC, Climate Change, 1992).

The problem of ozone pollution have different causes and effects, such as depletion in the upper atmosphere, concentration in lower atmosphere, and pose as greenhouse gas. Some researchers predict that low level ozone concentration might double over the next 100 years. The depletion of ozone in the upper atmosphere is much more serious problem. The ozone layer is not uniform around the world; varies in density being least dense over the equator and most dense over higher latitude. There is the formation of free chlorine atoms due to the breaking of CFCs, which is very effective at destroying ozone. One chlorine atom can help to destroy 100,000 ozone molecules. In 1985 a radical decrease in ozone layer was detected above Antarctica region by British scientists and declared as 'ozone hole'. Field monitoring showed a 40% thinning in the ozone layer. Near the ground ozone pollution is a major ingredient in photochemical smog. This smog sometimes affects living organisms greatly. Many plants wilt and sometime die, and people and animals suffer from irritation of eyes and lungs. So it is necessary to control ozone smog, which is mainly caused by vehicle pollution. The best way is to cut down on the emission of pollutant gases (particularly nitrogen oxides). So we have to fix the ozone problem at the earliest by sticking to our promise to restrict the use of ozone depleting substances. In this way we can make a full recovery of ozone layer within few decades.

### Water pollution and water resources

A wide range of human activities affect water availability and quality especially in areas with a high population density, concentrated industrial activity and intensive agriculture. Only a small fraction of the world's population has access to tap water that is suitable for drinking. In the European Union, this service is taken for granted, and it is forgotten that this is not the case everywhere. The indicators selected by the panels of water experts will give a comprehensive description of the pressures imposed on quality and availability of water resources and of the success of environmental policy to reduce them.

The Fifth Environmental Action Programme lists the following key targets for the year 2000:

- the prevention of over-exploitation of ground water and surface water for drinking water or industrial or other purposes;
- the prevention of pollution of ground water from diffuse sources; and
- a better ecological quality of surface and marine water.

The indicators formulated by the Scientific Advisory Groups for the policy field *Water Pollution and Water Resources* go into more detail: nutrients, overuse of ground water resources, pesticides, heavy metals and organic matter are listed as the most important pressures on water (NRC, 2008).

### **Soil erosion and conservation**

Soil conservation is the prevention of soil eroding from the earth's surface, or otherwise becoming altered by overuse, acidification or contamination. Soil erosion has become a topic of concern by researchers and environmentalists. Like other environmental concerns, soil erosion is also one of the most damaging factors of the environment. Soil erosion facts are associated with the nature of erosion, the causes and the preventive measures (WRI, 1993). We shall begin with the basic question, what is soil erosion? In brief, soil erosion is the process of detachment or weathering away of the soil particles from ground by various agents, rendering the land barren. Soil erosion is the loss of soil from land due to the effects of wind and water currents. It is a naturally occurring process - soil always shifts from one location to another - and, under normal conditions, this shifting takes place in a slow and gradual manner. However, under human impact, soil erosion is often drastically accelerated. Some of the issues that hasten the process are deforestation, over grazing and poor or over-zealous farming practices. Soil erosion, when it happens very gradually, has minimal effect on the land with enough time for new soil to form. But accelerated erosion is detrimental. It is serious environmental concern that every one should be aware of. Once the facts are clear, we can come forward to effectively implement the steps to control soil erosion. One good way to do this is soil conservation. The concept of the conservation of soil takes into account, the strategies for preventing the soil from getting eroded and preventing it from losing its fertility due to an adverse alteration in its chemical composition. Sincere steps of soil erosion prevention are taken by government to curb its disastrous effects. Here are some ways to conserve soil.

### **Plant trees**

We all know that the roots of trees firmly hold on to the soil. As trees grow tall, they also keep rooting deeper into the soil. As the roots of the trees spread deep into the layers of soil, they contribute to the prevention of soil erosion. Soil that is under a vegetative cover has hardly any chance of getting eroded as the vegetative cover acts as a wind barrier as well.

### **Terraces**

Terracing is one of the very good methods of soil conservation. A terrace is a leveled section of a hilly cultivated area. Owing to its unique structure, it prevents the rapid surface runoff of water. Terracing gives the landmass a stepped appearance thus slowing the easy washing down of the soil. Dry stonewalling is a method used to create terraces in which stone structures are created without using mortar for binding.

### **No-till farming**

When soil is prepared for farming by ploughing it, the process is known as tilling. No-till farming is a way of growing crops without disturbing it through tillage. The process of tilling is beneficial in mixing fertilizers in the soil, shaping it into rows and preparing a surface for sowing. But the tilling activity can lead to compaction of soil, loss of organic matter in soil and the death of the organisms in soil. No-till farming is a way to prevent the soil from being affected by these adversities.

### **Contour ploughing**

This practice of farming across the slopes takes into account the slope gradient and the elevation of soil across the slope. It is the method of ploughing across the contour lines of a slope. This method helps in slowing the water runoff and prevents the soil from being washed away along the slope. Contour ploughing also helps in the percolation of water into the soil.

### **Crop rotation**

Some pathogens tend to build up in soil if the same crops are cultivated consecutively. Continuous cultivation of the same crop also leads to an imbalance in the fertility demands of the soil. To prevent these adverse effects from taking place, crop rotation is practiced. It is a method of growing a series of dissimilar crops in an area sequentially. Crop rotation also helps in the improvement of soil structure and fertility.

### **Soil pH**

The contamination of soil by addition of acidic or basic pollutants and acid rains has an adverse effect on the pH of soil. Soil pH is one of the determinants of the availability of nutrients in soil. The uptake of nutrients in plants is also governed to a certain extent, by the soil

pH. The maintenance of the most suitable value of pH is thus, essential for the conservation of soil.

### **Water the soil**

We water plants, we water the crops, but do we water the soil? If the answer is negative, it is high time we adopt the method of watering soil as a measure of conserving soil. Watering the soil along with the plants is a way to prevent soil erosion caused by wind.

### **Salinity management**

The salinity of soil that is caused by the excessive accumulation of salts has a negative effect on the metabolism of the crops in soil. Salinity of soil is detrimental to the vegetative life in the soil. The death of vegetation is bound to cause soil erosion. Hence, salinity management is one of the indirect ways to conserve soil.

### **Soil organisms**

Organisms like earthworms and others benefiting the soil should be promoted. Earthworms, through aeration of soil, enhance the availability of macronutrients in soil. They also enhance the porosity of soil. The helpful organisms of soil promote its fertility and form an element in the conservation of soil.

### **Indigenous crops**

Planting of native crops is known to be beneficial for soil conservation. If non-native plants are grown, the fields should be bordered by indigenous crops to prevent soil erosion and achieve soil conservation.

Soil erosion facts are associated with the nature and causes of this natural phenomenon. It's a major environmental concern that everyone should be aware of.

### **Global warming**

It is clear that the evolution of the earth's atmosphere has been intimately linked with the development of life on earth. Today both biological and geochemical processes are involved in maintaining its composition, but one species, human, has now become so numerous that it is beginning to affect the composition of the atmosphere and shift it from its natural equilibrium.

It refers to the change in the average surface temperature of the globe due to increasing

concentration of greenhouse gases in the atmosphere. According to a report release by Inter-Governmental Panel on Climate Change (IPCC) in February 2001, the global mean temperature of the planet is likely to rise in the range of 1.4°C to 5.8°C by 2100 in relation to 1990 (IPCC, Climate Change, 1992). Preliminary indication shows that the changes in regional climate and extreme weather have already affected many physical and biological systems. Increased frequency of floods, droughts in different parts of the world, increase in sea levels, shrinkage of glaciers, melting of ice-sheets, lengthening of growing seasons in mid to high latitudes, polar ward shift of planets and animal habitat boundaries, early flowering of trees etc. are some effects of global warming.

Agriculture, fisheries, human settlements, economic sectors like industry, resources and financial service are particularly sensitive to climate. While rich and well-resourced communities may adapt to climate changes at some cost, the poor may not be able to do so because they are weak in resources, technology, education, skill, and infrastructure management capabilities. Hence global warming would produce net economic loss in many developing countries and under developed countries. The major impact of global warming are:

- Change in water distribution;
- Rainfall pattern will change;
- Water ecosystems are at risk;
- Influence on oceans; and
- Human health.

### **CONCLUSION**

Although the contribution made by fossil fuels to our modern lives is incalculable. On current trends, the world's use of energy is set to almost double in the first 30 years of this century, with about 90% of the growth likely to be met by gas, oil and coal. Oil is more in demand than ever, and supplies are expected to jump by double. Meanwhile, some alternative sources of energy are expected to go on the back burner i.e. the nuclear power (less than 7%), while hydro-electricity will hold the modest 2.2% shares. Sources such as solar energy and wind power are growing with a good pace. No doubt, global standards of living have been improved many fold due to fossil fuels but these carry a critical flaw. The problem relates to how fossil fuels influence the greenhouse effect and ultimately to the environment.

Now it is apparent that things are heating up, and that the number of draughts, storms, floods, heat waves, and other extreme events are on the rise. It is important to slow the warming as much as possible. This can be achieved by conserving energy, using less fossil fuel, eliminating CFCs altogether, and slowing

down deforestation, using renewable energy such as solar, wave and wind energy. Instead of deforestation we have to start afforestation to soak up CO<sub>2</sub>. So we can make a difference by controlling future greenhouse gas emissions and keep the problem under wraps. Climate change has come and gone in natural cycle since the early days of the planet. But this time it has been brought about by human abuse of our fragile environment. We are the cause of the problem, but we can also be the solution. We can make a difference by taking positive actions. While the problem is global, the solution can be resolved regionally or locally. For this we must play our part sincerely and become a part of the solution rather than the problem.

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