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## Ecological Imbalance and Its impact of Economy

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*The re-establishment of an ecological balance depends on the ability of society to counteract the progressive materialization of values. The ecological balance cannot be re-established unless we recognize again that only persons have ends and only persons can work towards them-*  
*Juan Illich*

### Abstract

*Ecosystem generally is in a state of balance. In a normal ecosystem many species coexist with other species in harmony. According to Oxford Dictionary of Geography (2009:146) "The Equilibrium between, and amicable coexistence of, organism and their environment is called ecological balance." If something happens to an ecosystem, it can shift from a state of balance or equilibrium to a state of imbalance. Ecological imbalance is a process when a natural or human-caused disturbance disrupts the natural balance of an ecosystem. It can harm the natural environment, economy, politics and society. The present paper deals with different dimensions of ecological imbalance on different sectors of economy.*

### Key words

Ecosystem, pollution, ecological imbalance, Climate Change, Natural resources

### Introduction

Many factors adversely affect the ecological balance, hence ecological imbalance is a multi-causal phenomenon. Natural factors called "Acts of Gods" are the factors over which human beings have no control. These factors namely volcanic eruptions, floods, forest fires, Tsunami, cyclones, earthquakes etc bring untold misery to the humanity. Anthropogenic activities too affect the ecological balance. Careless cutting of the trees, construction of gigantic reservoirs, altering the path of rivers, mining, hunting, over-exploitation of natural resources and many other factors can upset the ecological balance. However, too much interference of man in the environmental process is a recent phenomenon. The early men lived in harmony with nature and as a part of nature. In the early stage of evolution, Homo sapiens lived like animals and were obtaining their livelihood directly from nature without modification. In the absence of science and technology, the differences between homo-sapiens and other animal species were very marginal if not nil. The laws like "the struggle for existence and survival of the fittest" were applicable to animals and also to human beings. Both were subjected to same laws of evolution. However, the genetic superiority, erectile posture, ability to think and put into practice of Homo sapiens helped them in inventing the artifacts that established them as a separate and superior species in the ecosystem. The early inventions of human beings were related to procurement of food and other basic necessities. Man started inventing tools like hunting instruments made up of stones, bows and arrows and axe. Many inventions helped them to remove the vast forest cover and bring it under cultivation and hunt animals with precision. One invention followed another. All early inventions and technological advancement thus were related to basic issues like survival and human

happiness. Thus science and technology helped the man to dominate the nature and master it in all respects. Thus, Introduction of a new species, clearing the forest for cultivation, use of fossil fuel, hunting the non-human species etc have played disastrous role in upsetting ecological balance.

In India, degradation of land and soil erosion together has contributed to ecological imbalance. Out of 329 million hectares of total geographical area 144 million hectares of the land is vulnerable to soil erosion caused by two agents- water and wind and further 30 million hectares of land is degraded because of salinity and water logging. Since independence India has witnessed large scale deforestation because of over exploitation and mismanagement of forest resources. The tendency to convert forest for agricultural purpose has also destroyed forest cover. According to some estimates during the first two decades of planning (i.e., from 1951 to 1972) India has lost 3.4 million hectares of forest land out of which 70% of the land is lost owing to river valley projects, construction of roads and railways lines and establishment of industries (Natasha Kwat in her *Ecological Imbalance in India*). The National Committee on Environmental Planning has remarked that forest cover now is not more than 12 % of the total geographical area of the country. According to environmental experts, a country should have at least 33 % forest cover for the proper functioning of ecosystem. In post independent period, India resorted to the construction of gigantic dams to meet the demand for drinking water, electricity and to extend the irrigation facility. The construction of big dams may have met some of the expectations of the growing population, but submerged a vast forest area, displaced millions of tribes and folk population. Many villages submerged in water. Environmental movements launched to save forest were criticized as anti progressive.

Since many decades developing countries have resorted to over-exploitation of natural resources with the goal of increasing GDP and earn national exchange. Mining, like construction of reservoirs has also contributed to ecological imbalance and environmental degradation. It has resulted in large scale deforestation, soil and erosion and various types of pollution. However, with “The New Mineral Policy” declared in 1993 attempt was made to prevent environmental pollution arising out of mining operations. **Thus in India many factors namely unplanned and uncontrolled growth of industries, population explosion, use of modern means of communication and transportation, construction of railway lines and roads, fragmentation of habitation, over exploitation of all resources, construction of reservoirs, urbanization, unscientific agriculture, use of pesticides and herbicides, hunting and poaching of wild animals, over grazing, pollution etc., have disturbed the ecological balance beyond restoration.**

### Objectives

The main objectives of the paper are to :

- examine the causes of environmental imbalance
- analyze the impact of environmental imbalance on economy

### Discussion and analysis

**Ecological Imbalance is not a local problem but a global problem :** Ecological degradation and loss of ecological balance is not a regional but a global. Ecological imbalance endangers the mankind at a global scale regardless of any particular country, region and race. It can endanger the people of all ages; all classes and regions. In the initial stage, only a small segment of the population becomes vulnerable to the ecological degradation. With the passage of time, the ecological imbalance adversely affects the whole mankind. Depletion of Ozone layer, global warming, floods and Tsunami, earthquakes can affect all people living in different parts of the world. No one is safe and all are equally vulnerable. Hence, global consensus and international cooperation is an essential precondition to tackle the problem of ecological imbalance.

### Impact of Ecological imbalance on Economy

## Impact of ecological imbalance on agriculture

Agriculture is one of the important sectors of economy. The countries dominated by agriculture earn foreign exchange by way of exporting the agricultural products to other countries. It contributes to GDP and national income. Economic historian **Fernand Braudel (1973)** writes, “**The world (before the nineteenth century) consisted of one vast peasantry where between 80 and 95 percent of people lived from the land and nothing else. The rhythm, quality, and deficiency of harvests ordered all material life**”

In India even today 70 % of households depend on agriculture with 82 percent of farmers being small and marginal. In 2017-18, total food grain production was estimated at 275 million tonnes (MT). India is the largest producer (25% of global production), consumer (27% of world consumption) and importer (14%) of pulses in the world. India's annual milk production was 165 MT (2017-18), making India the largest producer of milk, jute and pulses, and with world's second-largest cattle population 190 million in 2012. It is the second-largest producer of rice, wheat, sugarcane, cotton and groundnuts, as well as the second-largest fruit and vegetable producer, accounting for 10.9% and 8.6% of the world fruit and vegetable production, respectively (Food and Agricultural Organization). Even countries like Pakistan, Bangladesh and China are basically agrarian in character and it is this sector that has absorbed large number of labour force. **According to World Development Indicators, in 2011, the agriculture sector alone has absorbed 45.1 % of the countries labour force (The News: 2018)**. Agriculture is more vulnerable to abrupt changes in nature and alterations in ecological balance. The ecological imbalance caused by hurricanes, Tsunami, floods, earthquakes not only endangers the agriculture but also the food supply and food prices. According to National Disaster Management authority, in Pakistan, the recent floods of 2014 affected 19,638 square km and 2,50000 farmers were adversely affected. India, recently witnessed floods. According National Disaster Management Authority of India, many states have been affected by floods. In Kerala alone, 54.1 lakh people were affected. It is followed by Assam (11.5 lakh), Karnataka (3.5 lakh). Fourteen districts in Kerala and 23 districts in Assam and 11 districts in Karnataka are adversely affected by floods and rainfall (*Times of India*:2018). Even advanced countries suffer on account of other natural disasters like hurricanes. **Thus ecological imbalance caused by natural disaster can affect the agrarian economy and ultimately country's GDP, national income and foreign exchange reserve.**

Today we are living in era of globalization. What happens in one country will affect the other countries dependent on them. Hence, ecological imbalance in a country can affect the international economy. Droughts, floods, scanty rainfall, soil erosion, land degradation, pollution, water logging are the factors that can alter the agriculture which in the long run can bring down the national income and foreign exchange. It can endanger the food supply and can push up the price of food grains. Thus, agriculture sector is heavily affected by alterations in weather and climate. Not just developing countries even the technologically advanced countries like USA are vulnerable to the ecological imbalance caused by global warming. A recent survey found that just 2.5°C of gradual global warming is likely to reduce agricultural value between 0.1-0.2 percent of global income (**Nordhaus and Boyer, 2000**). Even in coming years, agriculture may suffer on account of ecological imbalance caused by droughts, floods, and desertification, land degradation, hurricanes etc. Any slow change in climate and environment may allow the agriculture and the other ecosystem to make adjustment. The sudden and abrupt imbalance in the ecosystem on the other hand does not give adequate time.

**Impact of ecological imbalance on Forests and its effect on economy :** Natural resources are the basis of all economic activities. Soil, forests, mines, water, air and other natural resources are productive assets of an economy. In fact, productivity of economic system depends on the supply and quality of its natural resources. **Forests constitute second priority sector.** This sector is very vulnerable to abrupt climate change than agriculture. Forests are “highly climate-sensitive”.

Forests constitute another source of livelihood. According to **KS Shrivatsava (2015)** about 1.6 billion people of the world depend on forest for living. The forest products industry is a major source of economic growth and employment in the world. 60 Million Indigenous and tribal people of the world are wholly dependent on forest for livelihood.

**United Nations Forum on Forests** organized a session from 8-19 April, 2013, in Istanbul of Turkey. **Arun Agrawal, Ben Cashore, Rebekka Hardin** in their Background Paper writes: Even if only the formally recognized, officially reported monetary contributions of forests to the economies of the developing world are taken into account, they exceed US\$ 250 Billion. These direct, cash exchange based contributions of forests represent approximately 1% of the global output.

According to **Centre for International Forestry Research** (in its **Facts & Figures**) Forest products contribute to the economic base of many countries by contributing to economic growth, revenue, trade and investment. It writes that **“Forest industries provide formal employment to 0.4% of the global labor force, contributing to nearly 1% of global GDP in 2008** (FAO, 2012). Further, Forests contribute over US\$250 billion to the economies of the developing world (**Agrawal et al.**, 2012). This figure represents only officially reported monetary contributions, ignoring the informal sector and non-monetary values, meaning the contribution is actually much larger. Also Forests generate significant revenue for public institutions and governments. In countries such as Cameroon, forests generate 25% of public revenue through timber taxes and other fiscal instruments. This revenue can be redirected to be spent on other sectors, including for poverty-alleviation strategies (OECD, 2009). Forest products support economies through international trade. In 2010, the global trade in timber and timber products was worth more than US\$200 billion (Global Landscapes Forum, 2014).

The gradual and undesirable environmental changes can affect the forests very slowly. It may allow forests to accommodate and adjust with slow changes. However, sudden changes bring about the undesirable alterations in forest ecosystem and create ecological imbalance. The activities such as massive deforestation, construction of dams and railway lines, mining, forest-fire and many other human activities reduce the forest cover. The loss of forest cover will disturb ecological balance and destroy biodiversity. Any imbalance in forest ecosystem can affect the economy, GDP, national income and foreign exchange. Abrupt climate change adversely affects the forests and ecosystems will collapse. The impact of climate change on forest systems is currently an area of intensive research (e.g., **Hansen et al.**, 2001a; **Shafer et al.**, 2001), although the focus is on gradual climate change. These studies suggest that there may be some immediate damages associated with dieback in forests and that long-term productivity may increase in some species if CO<sub>2</sub> fertilization occurs. Many scientific studies illustrate the important point that adaptation (or well-designed management) can help ecosystems to adjust more rapidly and with lower overall economic costs.

Little is known about how climate-change affects the forests and forest wildlife. Forest products such as fruits, nuts, medicine, and mushrooms have high value in international market. Biodiversity has unique economic value. Abrupt climate change affecting the forest can affect the economy of the country. Tundra systems are highly susceptible to the effects of climate change because of their sensitivity to water table fluctuations, fire frequency, and permafrost melting (Gorham, 1991). Paleo-climatic investigations have shown that changes in biodiversity are correlated to climate variations. Abrupt climate shifts leads to species extinction or the loss of biodiversity. **Thus ecological imbalance in forest ecosystem caused either by natural or anthropogenic factors will affect the forest based economy.**

**Impact of Abrupt Climate Change on ecological balance and on Economic and Ecological Stocks** : Abrupt climate change affects “economic (capital) stocks and ecological stocks.” Capital stocks include tangible goods such as factories, equipment, and roads as well as intangible items such as patents, intellectual property, and institutions. Similarly, ecosystems depend on stocks of species, forests, water, and carbon as well as complex “webs” of interacting systems. Viewed along with other inputs, such as labor and water flows, capital stocks produce most of the world’s valuable market and non-market services such as food, recreation, water, erosion control, and many other environmentally related goods and services (sometimes termed “ecosystem services”).

It is generally believed that gradual climate change would allow much of the economic capital stocks to roll over without major disruption. By contrast, a significant fraction of these stocks probably would be rendered obsolete if there were abrupt and unanticipated climate change. For example, a rapid sea-level rise could threaten coastal buildings; abrupt changes in climate, particularly droughts or frosts, could destroy many perennial crops, such as forests, vineyards, or fruit trees. Rapid changes in climate could reduce the

value of improperly insulated, heated, and cooled houses. There may also be an impact on more intangible investments such as health, technological, and “taste” capital, although these are more speculative.

Similarly, ecological systems are vulnerable to abrupt climate change because they have long-lived natural capital stocks, they are often relatively immobile and migrate slowly, and they do not have the capacity of humans to adapt to or reduce vulnerability to major environmental changes. Ecological stocks are also vulnerable to anthropogenic influences on the environment, which repeatedly alter ecosystems and limit species abundance and composition as a result of habitat disturbance, fragmentation and loss. Many scholars have studied how some activities affect ecological balance. In southern New England, trees such as spruce, fir, and paper birch experienced local extinctions within a period of 50 years at the close of the Younger Dryas (Peteet *et al.*, 1993). North American extinctions of horses, mastodons, mammoths, saber-toothed tigers, and many other animals were greater at this time than at any other extinction event over millions of years (Meltzer and Mead, 1983). The reasons for this extinction have been linked to both climate and early human impacts (Martin, 1984). **Thus ecological imbalance can affect economic and ecological stock.**

**Indirect impact of Ecological imbalance on supply of labour force and wages :** Since the time immemorial the human beings have settled themselves in a place where environment is very conducive to their existence. After the permanent settlement, people weld themselves with the environment and contribute to it by way of supplying their labour power and skills. They play diversified roles in economy not just as consumers but also as producers of goods and services. The ecological imbalance brings about misery to the labour force. Because of ecological imbalance and the resultant effect, labour force migrates either to other places or to other sectors of economy. **The sudden shift of labour force either from one sector to other jolts the economy affects the existing wage structure and supply of labour force.**

**Impact of ecological imbalance on marine ecosystem and its impact on world food supply :** India has a coastline of 8129 km and has immense potential for producing a good variety of sea foods, demanded highly throughout the world and this has transformed fishing, a commercial industry. It is also an important sector which is contributing to the nation's economy and supporting the livelihood of millions of fisher folk. The total potential yield of the marine fishery resources of the Indian EEZ is revalidated as 3.93 million tonnes. The marine fish production during 2009-10 was 3.07 million tones. The export of marine products has steadily grown over the years from a mere Rs. 3.92 crore in 1961-62 to Rs. 16,597.23 crore in 2011-12 (Vennila A, Sheela Immanuel and Purushothaman)

Human beings derive food and fuel by exploiting marine ecosystem. The mainstay of coastal communities for their livelihood is ocean. The human-induced disturbances such as overexploitation, habitat destruction, pollution, bio-invasion and climate change can upset the ecological balance and in the ultimate analysis can affect the livelihood of fishers. The pressure on the marine resources is increasing steadily resulting in overexploitation. The resources of oceans are considered as common property and this consideration forms one of the major reasons for depletion of resources and degradation of the environment. Accidental and intentional discharges of pollutants by ships and cities located on the banks of seas may pose greater ecological risks such as bio-magnification, Invasion of alien species. Man-made factors kill biodiversity and alter the food-web in the oceans. **Thus any upset in the ecological balance in the oceans can endanger the economy that is based on the export of sea wealth.**

#### **Steps needed to restore the ecological balance**

Acid rain, global warming, pollution, climate change, biodiversity loss, deforestation, depletion of Ozone layer are purely international problems. They will affect the international community. The human-induced or the accelerated ecological imbalance should be prevented by arousing the consciousness of people.

It is through environmental education efforts can be made to educate the people about the dangers of ecological imbalance. The civil society can play an important role in this regard. The UNO and its organs can play meaningful role in creating the global consensus among the member countries regarding the issues related to carbon emission, climate change and global warming.

Countries should exercise maximum constraint while extracting natural resources. By way of recycling and reuse and switching over to alternative sources of energy, country can realize the dream of sustainable development. GDP and National income may suffer but in the long run it helps in restoring ecological

balance. Achieving national income through over exploitation of resources brings more harm to humanity in the long term. Economics, the science of wealth should guide the poor countries with a rational and suitable model of development.

### Conclusion

The need of the hour is to give maximum attention to the proper implementation of national and international regulations pertaining to environment. In India government has passed a number legislation to protect the nature and its ecological stocks. Unfortunately, due to population pressure and poverty some of the legislations are violated. Any effort to protect environment should give preference to abolition of poverty and employment generation.

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