



Review Paper

Ecosystem disintegration: An intimidation to the very subsistence of mother earth

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Abstract

Mother earth is the righteous place where the entire biotic community resides surrounded by all other abiotic components. Constant exchange of energy and matter is taking place in between the living as well as non living substances which is termed as biogeochemical cycle and this cycle is played the pivotal role in restoring earth's entire ecosystem. Ecorestoration is a natural phenomenon but now-a-days it is greatly disturbed by different anthropogenic activities. Human beings, the so called most intelligent creature on earth, have engineered their surroundings in such a way that this blue planet has turned into a ruined one. The greedy and unplanned human activities are constantly increasing the pollution load of air, water and soil which in turn increases the Environmental Pollution Index (EPI) of our surroundings. As a result this planet is posing great threat to the very existence of entire biosphere. Considering these facts this paper tries to explore the various man made causes of ecosystem degradation followed by its fatal consequences and also attempts to find out some probable solutions to these issues. The methodology of this paper is purely literature based. Secondary data were collected from reputed national and international journals, newsletters, survey reports etc., to prepare this paper. Apart from that authors own perception and views are also expressed in this paper. The present paper exposed that the harmful human activities are deteriorating the global ecosphere at an alarming rate. Therefore instant and productive steps such as conduction of Environmental Impact Assessment (EIA) along with adoption of green technologies must be taken to achieve Sustainable Development Goal (SDG) as well as to save this globe.

Keywords: Biogeochemical cycle, carbon foot print, Ecorestoration, Environmental Impact Assessment (EIA), Environmental Pollution Index (EPI), Green Technology, Sustainable Development Goal (SDG).

Introduction

Planet earth is the splendid place where the total biotic components take shelter encircled by all other nonliving elements. Continuous transfer of energy and matter is going on involving various living and abiotic substances through a self controlled natural phenomenon known as biogeochemical cycle which plays the key factor in maintaining proper ecological balance. Disintegration of ecosystem has become a burning concern now-a-days in front of entire human civilisation. It is alleged that a lot of human induced activities are greatly increasing the amount of carbon foot print into the various segments of environment resulting into damage and disruption of ecosphere¹⁻¹⁸. Different toxicants are constantly emitted through various point and non point sources and as a result of that the pollution load of ecosystem components are increasing gradually. Human beings are always considered as the most supreme creature on earth by nature due to their intelligence. They always have ruled over various components of ecosystem and at the same time have engineered their surrounding ecosphere to a great extent in the name of so called developmental activities and as a result Environmental Pollution

Index (EPI) is also increasing at an alarming rate. These phenomena have turned this blue planet into a polluted place for the entire biosphere. This is the high time for all of us to act immediately towards ecosystem restoration. Taking into account these particulars the present paper attempts to investigate the different anthropogenic sources of ecosystem dilapidation followed by its lethal consequences and also tries to recommend a number of feasible way outs to these concerns.

Methodology

The methodology of this paper is merely fiction based. Secondary data were accumulated from various standard national and international journals, newsletters, survey reports etc.¹⁻¹⁸ to prepare this paper. Besides that author's own discernment and outlook are also articulated in this paper.

Human evolution: Starting from forest dweller we gradually evolved through Stone Age, metal age followed by agrarian society i.e., agricultural man, industrial society i.e., industrial man and ultimately today's modern society i.e., technical man. Whatever may be the typological factor human beings can't live

alone and from time immemorial they are living in a society. But from stone era till date i.e., modern era the societal pattern of human beings have changed a lot. The main reason of that is advancement of science and technology. Ancient people were used to live in forests and were collecting their food through hunting and gathering. Gradually they developed the art of agriculture and started to pollute our ecosystem. The greedy nature of human beings increasingly changed the green earth into an almost grey earth. Nowadays nobody is getting escaped from the adverse impact of environmental degradation and if this situation persist human beings including all other living creatures will not at all be able to survive on earth any more.

Degradation of ecosystem

Various anthropogenic activities have continuously degraded our ecosystem and as a result so many adverse impacts on environment may be observed. The population rate is increasing very fast especially in the third world countries. In case of India in 1947 (the year of independence) its total population was 33 crores where as in 2021 its population is supposed to be around 135 crores. That means just within 75 years India's population has increased more than 100 crores. More population means more demand of energy, land, water, soil etc., which in turn creates enormous pressure on our ecosystem and also exploits and degrades our natural resources. Various researchers showed that poverty also exerts tremendous pressure on surrounding ecosystem by polluting various abiotic components of environment. Rich and developed countries are constantly overexploiting earth's various natural resources in the name of so called developmental activities like linking of rivers, constructions of large dams (on ecologically sensitive zones), roads, residential complexes, business apartments, industrial establishments, energy production units, mining activities etc. Agricultural activities are also creating gigantic ill effects to our forest resources as well as all other natural resources through deforestation, application of chemical fertilisers, pesticides, insecticides, fungicides, rodenticides, herbicides etc., on the crop field and also through generation of green house gasses. As a result of these anthropogenic activities our surrounding ecosphere i.e., atmosphere, lithosphere and hydrosphere are constantly getting deteriorated. Earth's noise environment is also affected due to different human activities. Huge portion of forest cover and biodiversity are also greatly reduced. We are constantly losing our age old rich traditions and indigenous cultures. Acid rain, acid mine drainage (AMD), photochemical smog etc., are giving huge pressure on various natural resources including forest resources. Incidents of natural hazards viz., flood, drought, desertification, tsunami etc., are increasing day by day throughout the whole world and generating mammoth amount of environmental refugees⁹. As a consequence of anthropogenic activities our climate is changing rapidly which in turn reduces the agricultural productivity and the problem of food scarcity is being generated due to it. The rate as well as amount of emission of various green house gasses has increased greatly. During the preindustrial revolution the atmospheric

carbon-di-oxide (CO₂) concentration was just 260 parts per million (ppm) where as in recent times atmospheric carbon-di-oxide (CO₂) concentration is somehow ranging between 410 – 420ppm. Melting of polar ice sheet and sea level rise are the direct resultants of global warming and green house effect. All these phenomena are causing synergistic effect to disintegrate the various components of ecosystem.

Environmental Kuznet's Curve (EKC)

A close study of EKC will enable us to understand the relationship between ecosystem degradation and various anthropogenic activities. It shows that during pre-industrial economy when Gross Domestic Product (GDP) as well as a per capita income of the mass segment of the world was low the environmental degradation was also low due to less generation of greenhouse gasses. During the era of industrial economics GDP as well as the per capita income of the mass segment of the world increased a lot with the increasing rate of green house gas emission and as a consequence of it deterioration of ecosystem has happened gradually. Further the GDP and per capita income will increase more during the post industrial era which will be basically service sector based economy. During this era if we able to apply the various ecosystem management options successfully then the level of green house gas emission will be decreased and as a result of that ecosystem will be restored.

Management options

This is the high time for us to act immediately if we want to save our mother earth from getting further deterioration. Various management options may be adopted to reduce the rate of ecosystem degradation. At first we have to modify our production process which will generate less waste as well as pollute less and we have to adopt 3R concept i.e., recycling of unused raw materials, reuse of wastes to produce other by-products and recovery of valuable materials from waste remains. Integrated treatment approach i.e., combination of chemical as well as biological process of treatment should be applied to reduce pollution load from waste streams. Agricultural productivity can be increased through the application of integrated treatment management approach (IPM). A combination of biofertiliser and chemical fertiliser might be adopted by the farming communities to achieve optimum crop production. Application of biofertilisers must be increased instead of chemical fertilisers in the crop field which in turn increase the soil fertility as well as improve the overall soil health and at the same time pollute to a minimal amount. Introduction of biological agents such as biopesticides etc., instead of chemical agents like pesticides, herbicides, fungicides, rodenticides etc., in the crop field will be able to eliminate unwanted elements from the crop field naturally and also make no damage to the surrounding ecosystem. We can increase our green cover through reforestation and afforestation. All of us will have to change our consumption pattern and also

will have to use our natural resources in a very sustainable manner. Biocomposting and vermicomposting process can be applied to produce bio-energy from biodegradable waste materials. Adoption of low carbon economy by various governments and world leaders will definitely help to reduce the pollution load from the ecosystem. Sustainable use of conventional energy resources and much more consumption of renewable energy resources will improve the overall environment. Many small dams should be constructed on the rivers one large dam to produce hydroelectricity that will pose comparatively much less threat to the ecosystem. Environmental Impact Assessment (EIA) should be carried out before the establishment of every large developmental project. Ecoaudit, green accounting and environmental inventory should be carried out regularly by each industrial set up. Life Cycle Assessment (LCA) of every industrial product will give us the idea of carbon foot print for the respective product and based on that value we can modify or alter our production process to decrease the pollution load on ecosystem. If we get success to arrange industrial symbiosis in scientific and planned manner then we will be able to reduce the waste generation from many industries because then waste of one industry can easily be utilised as the very raw material for another industry and hence almost zero waste could be produced. Strict implementation of various

environmental laws including polluter pay principle should be implemented all the world leaders together if we want to reduce the pressure on our surrounding ecosystem. Again environmental education and awareness program should be provided at all levels (i.e., from primary to research level) and for all segments of the society irrespective of age, gender, culture as well as economic condition and then only we will be able to reduce the current rate of ecosystem disintegration. We all are affected due to it and hence all of us will have to put our hands together and will have to work jointly and then only we will be able to get success to some extent towards the much-needed noble march of ecological restoration.

Conclusion

The current paper depicted that the detrimental human activities are damaging the total ecosystem to a great pace. Hence instantaneous and positive result oriented fruitful movements such as conveyance of Environmental Impact Assessment (EIA) in conjunction with implementation of green technologies have to be taken to accomplish Sustainable Development Goal (SDG) and to present a cleaner and greener earth to all of our future generations to come.

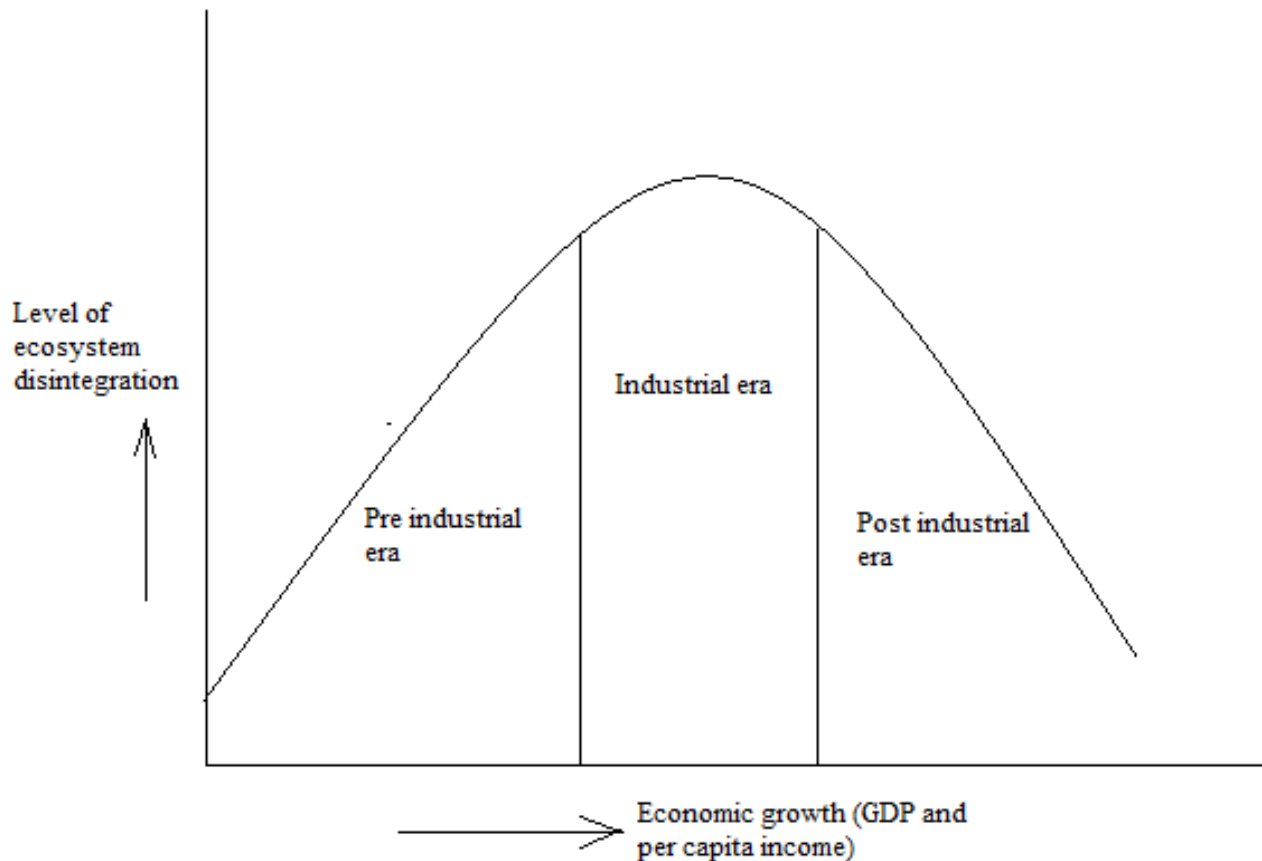


Figure-1: Environmental Kuznet's Curve (EKC).

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