In: Environmental Degradation: Causes and Remediation Strategies
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CHAPTER [1]

An introduction to environmental degradation: Causes, consequence and mitigation

Pradip Kumar Maurya[1,*], Sk Ajim Ali[2], Ateeque Ahmad[2], Qiaoqiao Zhou[3], Jonatas da Silva Castro[4], Ezzat Khan[5] and Hazrat Ali[5]

[1]Department of Zoology and Environmental Science Gurukula Kangri Vishwavidyalaya, Haridwar-249404 (Uttarakhand), India
[2]Department of Geography, Faculty of Science, Aligarh Muslim University, Aligarh (Uttar Pradesh), India
[3]College of Resources and Environment, Hunan Agricultural University, Changsha 410128, China
[4]Nilton Lins University Manaus, Amazonas Brazil
[5]Department of Chemistry, University of Malakand, Chakdara 18800, Dir Lower, Khyber Pakhtunkhwa, Pakistan

ABSTRACT

The environmental degradation is the deterioration of the environment through depletion of resources which includes all the biotic and abiotic element that form our surrounding that is air, water, soil, pant animals, and all other living and non-living element of the planet of earth. The major factor of environmental degradation is human (modern urbanization, industrialization, overpopulation growth, deforestation, etc.) and natural (flood, typhoons, droughts, rising temperatures, fires, etc.) cause. Today, different kinds of human activities are the main reasons for environmental degradation. The automobile and industries increase the number of poisonous gases like SO_x, NO_x, CO, and smoke in the atmosphere. Therefore, the government must enhance filling the gap in the legal system to avoid illegal activities. This chapter discusses the impact of environmental degradation with its future impacts, city planners, industry, and resource managers plans to be considered to mitigate the long term effects of developmental environmental degradation.

KEYWORDS

Environmental degradation, Manmade impacts, Mitigation, Pollution

Pradip Kumar Maurya, Email: pk.maurya86@gmail.com, pmaurya_rs@gkv.ac.in

Introduction

The environment is something we are very familiar with. It's everything that makes up our surroundings and affects our ability to live on the earth. Environmental degradation is a very serious problem worldwide which covers a variety of issues including pollution, biodiversity loss, and animal extinction, deforestation and desertification, global warming, and a lot more (Brown *et al*., 1987; Tian *et al*., 2004). The environmental degradation is deterioration of the environmental through depletion of resources which includes all the biotic and abiotic element that form our surrounding that is air, water, soil, plant, animals, and all other living and non-living element of the planet of earth (Bourque *et al.,* 2005; Malcolm and Pitelka, 2000). Environmental degradation is also having a useful aspect, more new genes have been created, and some species have grown as someones have declined. For natural selection, species are constantly regenerating as the environment changes, and human activity is the main driver's power. Human is also a product of nature; this shift is to natural replacement.

Most of the people about three-fourths of its population depends directly for their livelihood on activities based on natural resource and the remainder of the population relies on these resources directly for food, fuel, industrial output, and recreation (Raven *et al*., 1998). Most of the natural resources including the environment in India are in a serious state of degradation. The use of agriculture fertilizer is a major factor for the degradation of soil quality, soil erosion, salinity and general loss of fertility of agricultural land as well as the loss of the production of the quality crop. Similarly, groundwater aquifers are overexploited in many arid and semi-arid areas, surface water sources are highly polluted and consequently, water for drinking and irrigation is increasingly getting scarce and polluted. Fishery yields are declining, and air quality is deteriorating. Increasing levels of air, water, and land pollution pose a serious threat to human health and longevity (Malik *et al*., 2014; Malik *et al*., 2018; Yadav *et al*., 2019). Good environmental management is essential for economic growth and development. It is not a sometime mistakenly asserted just a luxury for wealthy countries concerned with aesthetics. Climate change and environmental degradation affect all types of development projects in all countries. If the development agencies are seriously contributing to the reduction of poverty in the communities in which they work, they must give consideration to the climatic and environmental hazards which impact their projects. Climate change and environmental degradation are proceeding rapidly and are already affecting many communities in developing countries. O'Neill *et al*. (2010) reported that slowing population growth could provide 16-29% of the emissions reductions, and suggested to be necessary by 2050 to avoid dangerous climate change. His study in 35 countries suggested that, slowed population growth could save 1.4 to 2.5 billion tons of carbon emissions per year by 2050, certainly help to solve the climatic problem.

Causes of environmental degradation

The major factor of environmental degradation is human (modern urbanization, industrialization, overpopulation growth, deforestation, etc.) and natural (flood, typhoons, droughts, rising temperatures, fires, etc.) cause. Environmental pollution refers to the degradation of the quality and quantity of natural resources. Different kinds of human activities are the main reasons for environmental degradation. The automobile and industries increase the number of poisonous gases like SO_x, NO_x, CO, and smoke in the atmosphere. Unplanned urbanization and industrialization have caused water, air, soil, and sound pollution. Industrialization, urbanization, and sewage waste help to increase pollution of the sources of water (Olorode *et al.*, 2015). Similarly, the smoke emitted by vehicles and industries like Chlorofluorocarbon, nitrogen oxide, carbon monoxide, and other dust particles pollutes the air. Since man began to use tools and gradually formed a society, he began to play an important role in the evolution of the natural environment shown in Figure 1.

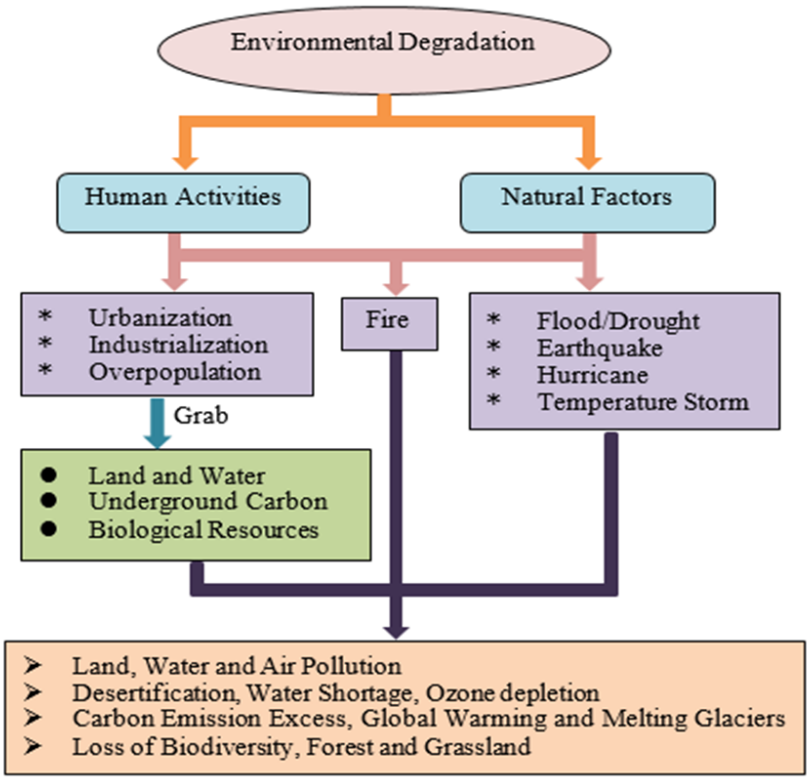

Figure 1. Different causes of environmental degradation.

Land degradation

Land degradation is a worldwide problem: land degradation may occur naturally as well as manmade activities. The climate change majorly combined with human activities for continuous soil degradation. Wilcox *et al*. (2003), Vanacker *et al*. (2014), Maurya and Malik (2016a), noted that surface soil disturbances can modify surface topographical features and the vegetation patch structure (Mohr *et al*., 2013; Malik and Maurya, 2015). The deforestation, desalination, waterlogging desertification, wasteland and soil erosion. FAO estimated that about 2 billion people (or ¾ of the population of developing countries at that time) depended on biomass for their daily energy consumption (Kumar *et al*., 2020).

Pollution

Air pollution refers to the release of harmful contaminants (chemicals, toxic gases, particulates, biological molecules, etc.) into the earth's atmosphere. These contaminants are quite detrimental, and in some cases, pose serious health issues. Water pollution is said to occur when toxic pollutants and particulate matter are introduced into water bodies such as lakes, rivers, and seas. These contaminants are generally introduced by human activities like improper sewage treatment and oil spills. Pollution is a very serious worldwide problem, pollution resulted in the deterioration of the quality of natural biotic and abiotic factors (Rahman *et al*., 2017; Cheng *et al*., 2016). Water pollution is a very big problem especially in developing countries in the world. The water covered about 71% of the total earth's surface and groundwater. The groundwater scarcity is especially in the developing countries of the worldwide (Karikari and Ansa, 2006). Water is one of the more demandable of all urban and rural amenities and indispensable for human activities including water for drinking and irrigation, recreational opportunities and habitat for economically important fisheries. Pollution poses a serious risk to life, especially when the water is a source of drinking and for domestic purposes for humans, polluted waters are potent agents of diseases such as cholera, typhoid, and tuberculosis. Olaniran (1995) defined water pollution to be the presence of excessive amounts of a hazard (pollutants) in water in such a way that it is no longer suitable for drinking, bathing, cooking or other uses. Pollution is the introduction of contamination into the environment**.** Water pollution is generally induced by humans. It results from the actions of humans carried on to a better self. These could be treated under the various activities that man engages in, which leads to pollution. The growth of the human population, industrial and agricultural practices is the major cause of pollution (Maurya and Malik, 2016a). As they respire, the decomposers use up dissolved oxygen (O_2) and the Biological Oxygen Demand (BOD) reduces. The flora and fauna of the rivers experience change and reduction in number due to death by suffocation (Maurya and Malik, 2016b; Maurya *et al*., 2019). The growing problem of pollution of the river ecosystem has necessitated the monitoring of water quality. Freshwater is a finite resource, essential for agriculture, industry and even human existence, without freshwater

of adequate quantity and quality, sustainable development will not be possible. Industry and automobiles are the primary and secondary contributors to air pollution worldwide (Kay, 1999); the automobiles are used every gallon of gasoline manufactured, distributed and then burned in a vehicle, produced along with carbon dioxide, carbon monoxides, sulfur dioxide, nitrogen dioxide, and particulate matter; these emissions contribute to increased global warming (Alexander and Kanner, 1995; Mark, 1997).

The environmental protection agency (EPA) estimates that industrial workers suffer up to 300,000 pesticide-related acute illnesses and injuries per year, mostly cholinergic symptoms from anticholinesterases and lung disease from airborne exposure (Hansen and Donohoe, 2002; Mellon *et al*., 1995). These are toxic, remain in the environment long-term, resist degradation, and can travel long distances.

Global warming

Global warming which is also referred to as climate change is the observed rise in the average temperature of the Earth's climate system the global surface temperature is likely to rise a further 0.3 to 1.7 °C in the lowest emissions scenario, and 2.6 to 4.8 °C in the highest emissions scenario. These readings have been recorded by the "national science academies of the major industrialized nations". Future climate change and impacts will differ from region to region. Expected effects include an increase in global temperatures, rising sea levels, deforestation, imbalance climatic condition, changing precipitation, and expansion of deserts (Cunningham *et al*., 1999). Global warming has several adverse effects on human health, and agricultural production. It leads to an increase in heat-related diseases, civil conflict, decreases economic sources shown in Figure 2. Besides, it also indirectly affects human health due to the higher incidence of malaria, dengue, yellow fever and viral encephalitis caused by the expansion of mosquitoes and other disease carriers to warm areas. The adverse effect on agricultural production is due to the increased frequency of droughts, floods and hurricanes and increased incidence of pests, causing a shortage of food.

Overpopulation

It is very likely that population growth as a missing scientific agenda accounts in part for the reduced public knowledge and interest in this issue. The extent of environmental degradation varies across countries and regions of the world. Rapid population growth puts a strain on natural resources which results in degradation of our environment. The mortality rate has gone down due to better medical facilities which have resulted in increased lifespan. More population simply means more demand for food, clothes, and shelter. You need more space to grow food and provide homes to millions of people. This results in deforestation loss of biodiversity, destruction of the ecosystem which is another factor of environmental degradation shown in Figure 3.

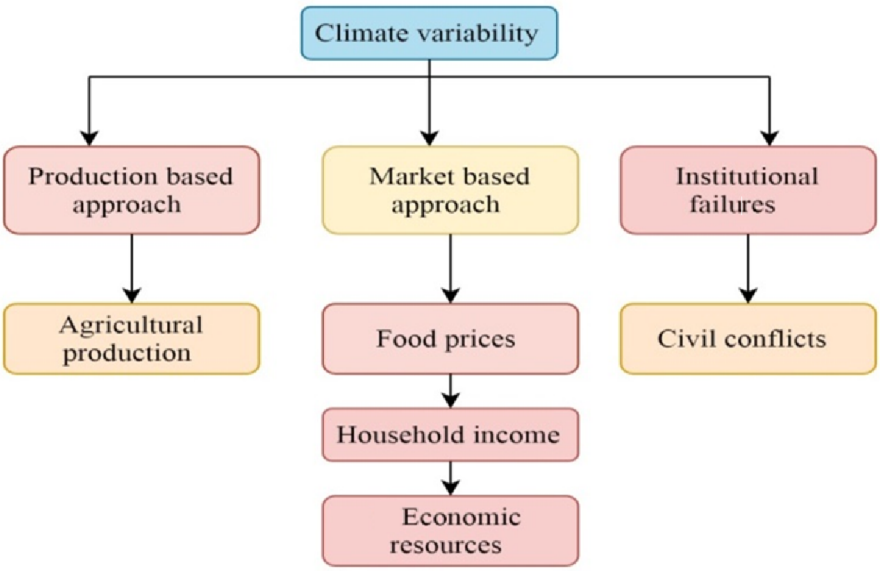

Figure 2. Climate variability matters for food insecurity- diagrammatic presentation.

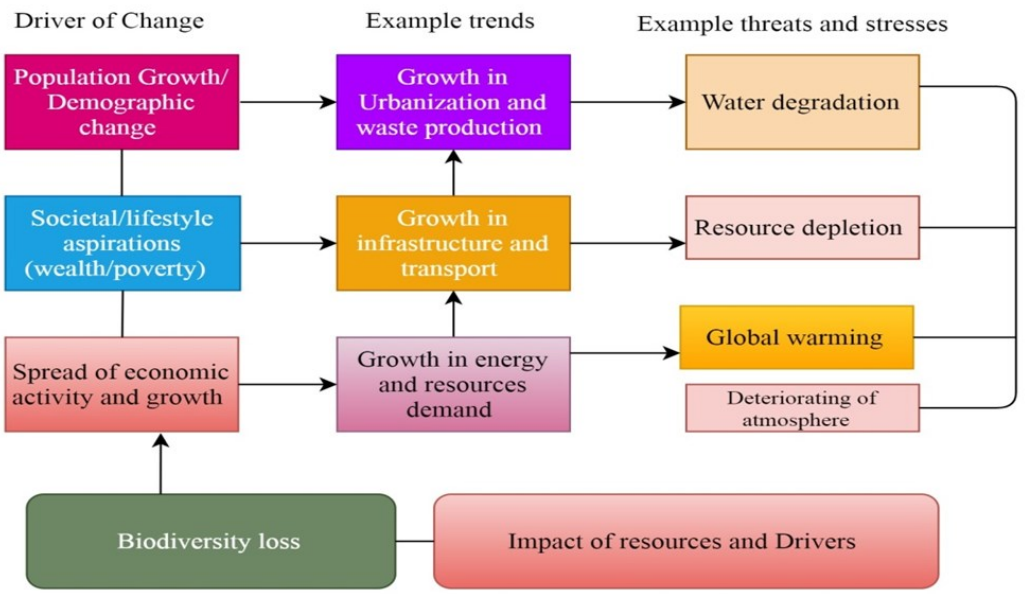

Figure 3. Flow chart indicated the loss of biodiversity through the developmental aspect (Source: Foresight, 2000).

Landfills

Landfills pollute the environment and destroy the beauty of the city. Landfills come within the city due to the large amount of waste that gets generated by households, industries, factories, and hospitals. Landfills pose a great risk to the health of the environment and the people who live there. Landfills produce a foul smell when burned and cause huge environmental degradation.

Deforestation

Forests are invaluable property of a nation because they provide raw materials to modern industries, timber for building purposes, habitats for numerous types of animals and micro-organisms. Good fertile and nutrient-rich soils having a high content of organic matter offer protection to soils by binding the soils through the network of their roots and by protecting the soils from the direct impact of falling raindrops. They encourage and increase the infiltration of rainwater and thus allow maximum recharge of groundwater resources, minimize surface run-off and hence reduce the frequency, intensity, and dimension of floods. Deforestation is the cutting down of trees to make way for more homes and industries. Rapid growth in population and urban sprawl are two of the major causes of deforestation. Apart from that, the use of forest land for agriculture, animal grazing, harvests for fuelwood and logging are some of the other causes of deforestation. Deforestation contributes to global warming as decreased forest size puts carbon back into the environment.

Deforestation gives birth to several problems encompassing environmental degradation through accelerated rate of soil erosion, increase in the sediment load of the rivers, siltation or reservoirs and river beds, increase in the frequency and dimension of Hoods and droughts, changes in the pattern of distribution of precipitation, intensification of greenhouse effects increase in the destructive force of the atmospheric storms, etc.

Natural causes

Things like avalanches, quakes, tidal waves, storms, and fires can totally crush nearby animal and plant groups to the point where they can no longer survive in those areas. This can either come to fruition through physical demolition as the result of a specific disaster or by the long-term degradation of assets by the presentation of an obtrusive foreign species to the environment. The latter frequently happens after tidal waves, when reptiles and bugs are washed ashore, of course, humans aren't totally to blame for this whole thing. Earth itself causes ecological issues, as well. While environmental degradation is most normally connected with the things that people do, the truth of the matter is that the environment is always changing. With or without the effect of human exercises, a few biological systems degrade to the point where they can't help the life that is supposed to live there.

The economic logic

Environmental change is one of the myriads of pressures or demands made upon state resources and attention. Many of the responses to environmental stress that occur involve uncoordinated human responses greatly affected by markets. Accordingly, producers and consumers respond to changes in prices, relative incomes, and external constraints. But frequently market 'signals' do not reflect social values, as in the case of intergenerational equity, for example, or the deleterious effects of environmental degradation are not internalized in market prices and remain as 'externalities'. As a result, states often choose to intervene with collective actions aimed at managing environmental change and reducing the associated adverse social and economic effects.

Effects of environmental degradation

Impact on human health

Human health might be at the receiving end as a result of environmental degradation. Areas exposed to toxic air pollutants can cause respiratory problems like pneumonia and asthma. Millions of people are known to have died off due to the indirect effects of air pollution (Adakole and Oladimeji, 2006).

Loss of biodiversity

Biodiversity is important for maintaining the balance of the ecosystem in the form of combating pollution, restoring nutrients, protecting water sources and stabilizing climate. Deforestation, global warming, overpopulation, and pollution are a few of the major causes of loss of biodiversity.

Ozone layer depletion

The ozone layer is responsible for protecting the earth from harmful ultraviolet rays. The presence of chlorofluorocarbons, hydrochlorofluorocarbons in the atmosphere is causing the ozone layer to deplete. As it will deplete, it will emit harmful radiation back to the earth (Buhaug *et al*., 2010).

loss for the tourism industry

The deterioration of the environment can be a huge setback for the tourism industry that relies on tourists for their daily livelihood. Environmental damage in the form of loss of green cover, loss of biodiversity, huge landfills, increased air, and water pollution can be a big turn off for most of the tourists.

Economic impact

The huge cost that a country may have to borne due to environmental degradation can have a big

economic impact in terms of restoration of green cover, cleaning up of landfills and protection of endangered species. The economic impact can also be in terms of the loss of the tourism industry. As you can see, there are a lot of things that can have an effect on the environment. If we are not careful, we can contribute to the environmental degradation that is occurring all around the world. We can, however, take action to stop it and take care of the world that we live in by providing environmental education to the people which will help them pick familiarity with their surroundings that will enable to take care of environmental concerns thus making it more useful and protected for our children and other future generations.

Extents of environmental degradation

Land degradation

Trash and garbage are a common sight in urban and rural areas of India. It is a major source of pollution. Indian cities alone generate more than 100 million tons of solid waste a year. Street corners are piled with trash. Public places and sidewalks are despoiled with filth and litter, rivers and canals act as garbage dumps. Soils are a key element in the climate change equation and perhaps the least well understood. Although models of soil organic matter decomposition predict increasing rates with increasing temperature, field measurements seem to contradict model results (Sax *et al*., 2002). In addition to increases in CO_2 emissions, industrialization has increased the amount of nitrogen deposition. Nitrogen deposition from human activities may help forests that are nitrogen-limited, but excess nitrogen deposition can lead to soil acidification and reduced nutrient availability to plants (Aber *et al*., 2001; Magnani *et al*., 2007).

Degradation of water resources

Microbe contamination of groundwater due to sewage outfalls and high concentration of nutrients in marine and coastal waters due to agricultural runoff are among the most serious threats (Kumar *et al*., 2019a). Contact with unsafe drinking or bathing water can impose serious risks (both acute and delayed) on human health. While tap water is subject to treatment and is required to meet detailed testing and purity standards, it is not always disinfected of diarrhea inducing microorganisms, as illustrated by waterborne disease outbreaks such as that caused by Cryptosporidium in Milwaukie in 1993, which affected over 400,000people. Furthermore, faecal coliforms are not prohibited in bottled water (Nation Staff, 1996), and water bottled and sold within the same state is not subject to Food and Drug Administration standards (Hammitt *et al*., 2006).

Today 40% of waters are unfit for fishing or swimming, and levels of mercury in fish in 40 states. Clean Water Act of 1972 states to publish a list of all bodies of water that fail to meet water quality

standards, and for the states to set pollution limits and scale back pollution in watersheds until standards are met, compliance is negligible and enforcement weak. Discharge of untreated sewage is the single most important cause for pollution of surface and groundwater in India (Kumar *et al*., 2019b). There is a large gap between the generation and treatment of domestic wastewater in India. The problem is not only that India lacks sufficient treatment capacity but also that the sewage treatment plants that exist do not operate and are not maintained.

In a National Resources Defence Council study of the quality of bottled water (Nation Staff, 1996), approximately one-fifth of samples exceeded bacterial purity guidelines and/or safe levels of arsenic or other synthetic organic chemicals (AJS, 1999). Between 25% and 40% of bottled water was merely repackaged municipal tap water. The cost of illness approach and Shuval calculates the disability-adjusted life years (DALY), to quantify the health burden from illnesses associated with exposure to polluted recreational coastal waters. India is recognized as has to have major issues with water pollution, predominately due to untreated sewerage. Rivers such as the Ganges, the Yamuna, and Mithi Rivers, all flowing through highly populated areas, thus polluted.

Effluents are another by-product of industries which poses threat to the environment, leather and tanning industries, petroleum industries and chemical manufacturing industries create major waste products that are released directly into nearby streams without treatment, creating river pollution and causing harm to aquatic life. The majority of the government-owned sewage treatment plants remain closed most of the time due to improper design or poor maintenance or lack of reliable electricity supply to operate the plants, together with absentee employees and poor management. According to a World Health Organization study, out of India's 3,119 towns and cities, just 209 have partial sewage treatment facilities, and only 8 have full wastewater treatment facilities. Over 100 Indian cities dump untreated sewage directly into the Ganges River. Investment is needed to bridge the gap between 29000 million liters per day of sewage India generates, and a treatment capacity of a mere 6000 million liter per day.

Drought, desertification, and Water Scarcity

Drought and water scarcity are the third main climate change impact that may significantly contribute to climate-related migration. Droughts, desertification, and water scarcity are likely to increase because of global warming. These phenomena are projected to affect about one-third of the world's current population. Droughts are likely to displace millions of people all over the world, affecting food insecurity and human livelihoods. Sea level rise will extend areas of salinization of groundwater and estuaries, resulting in a decrease in freshwater availability for humans and ecosystems in coastal areas. Moreover, changing precipitation patterns create pressures on the availability of clean water supplies.

Degradation of fisheries

In many parts of the world, fish is one of the important components of the human diet. Due to this reason, fish caught from natural water bodies increased highly. This fact can tell us the need of studying the fish stocks in the natural water bodies especially the commercial fishes to manage them in an optimum way. Losses in fisheries include natural and fishing material losses of fish due to spoilage, breakage, size, discarding bycatch and operational losses. Although the extent of the problem varies from place to place, the country as a whole loses huge quantities of fish after capture before it reaches consumers. The need for assessment is a first step towards overcoming losses and defining solutions to the existing problem, Figure 4 indicated that trade work and GDP production economic scale structure technique and conservation of environmental policies structure.

The main reasons for losses were the fishing method, inadequate handling facilities, and delay between catch, collection and distribution, absence of regulations governing quality and standards of fish to be sold for human consumption, lack of regular supervision from the government side and poor extension service and fragmentation of duties and responsibilities in different institutions. Nevertheless, the protection of marine and coastal areas and habitat restoration should not be seen as solutions replacing conventional management approaches, but need to be components of an integrated program of the coastal zone and fisheries management.

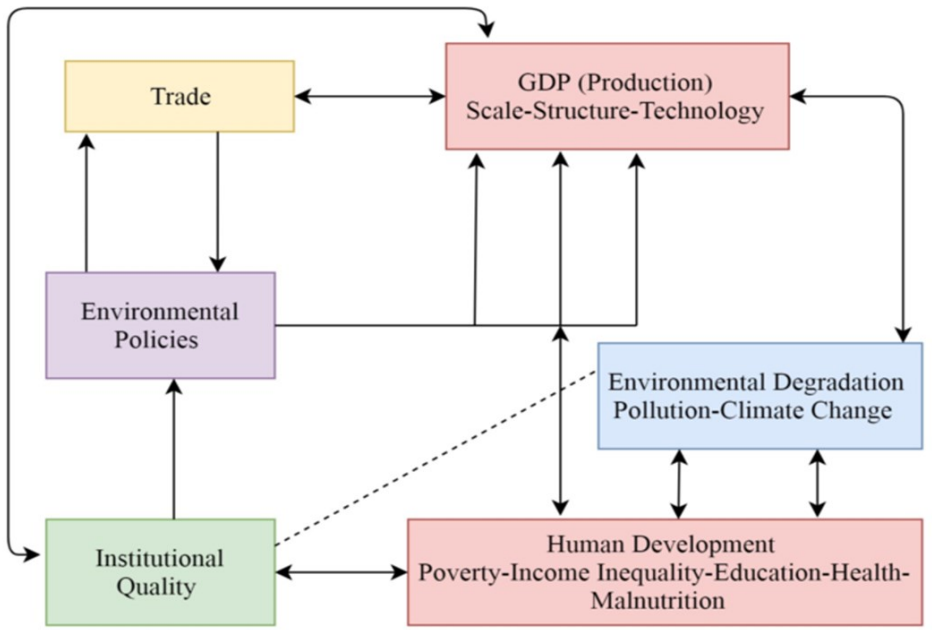

Figure 4. Relationship between environmental degradation and economic development.

Loss of biodiversity

India is a treasure chest of biodiversity which hosts a large variety of plants and has been identified as one of the eight important "Vavilorian" centers of origin and crop diversity. India accounts for 8% of the total global biodiversity with an estimated 49,000 species of plants of which 4900 are endemic (Groom *et al*., 2010). The ecosystems of the Himalayas, the Khasi and Mizo hills of northeastern India, the Vindhya and Satpura ranges of northern peninsular India, and the Western Ghats contain nearly 90 percent of the country's higher plant species and are therefore of special importance to traditional medicine.

Biodiversity is declining on two scales- β diversity (the difference in biodiversity between regions species identities in more and more locations are becoming similar) and γ diversity (global biodiversity is declining), but at particular locations, α diversity may be increasing due to the addition of invaders (Sax *et al*., 2002; Sax and Gaines, 2003). Sax and Gaines (2003) make clear that this phenomenon is not restricted to islands – rather, local biodiversity is increasing in many continental locations as well. Few authors documented declines in a number of components of biodiversity (Pimm *et al*., 1995; Vitousek *et al*., 1997; Sala *et al*., 2000). The pertinent fact is that levels of extinction over the last 300 years are at least several hundred times greater than expected based on the geological record (Diamond, 1989; Dirzo and Raven, 2003). The destruction of wildlife is a different factor that is the reduction of forest and human interfere, hunting it is believed to have been amongst the most significant factors driving the extinction of large wildlife species Table 1 and Table 2 indicated that some endangered flora and fauna respectively. In India hunting has been recognized as a major factor in historical declines of wildlife.

Education and environmental preferences

Education is an essential tool for environmental protection. Education enhances one's ability to receive, decode and understand information, and that information processing and interpretation have an impact on learning and change behaviors. In recent years, education has been considered a vehicle for sustainable development and thus for the fight against pollution. Education is "a permanent learning process that contributes to the training of citizens whose goal is the acquisition of knowledge, soft skills, and know-how and good manners. The positive effect of education on environmental quality can be channeled in three ways. Firstly, educated people tend to be more conscious of environmental problems and therefore would have behaviors and lifestyles in favor of environmental improvement and demand for environmentally friendly products and decreases the population growth Figure 5.

Mitigation of environmental degradation

There are ways which can help to decrease degradation in our environment. Some of these include:

Table 1. Endangered flora, causes for loss of biodiversity and places last found (Sources: Anil *et al*., 2014).

Species endangered	Place of interest	Causes
Rauvolfia serpentine, Terminalia chebula, Sapindus lauri-folius and Jatropha curcas	Western Ghats	Destructive harvesting followed by unscientific handling
Catuneregam spinnosa, Garcinia cambogea, Acacia pinnata, Ficus benghalensis, Zanthoxzyllum rhesta, Hemides-mus indicus, Terminalia chebula, Wrightia zeylanica, Cin-namomum verum, Bombax ceiba, Sapindus laurifolius, Alangium salvifolium and Calophyllum inophyllum	Maradavally, Shimoga district	Medicinal use and deforestation
Abrus precatorius, Adenanthera paronina, Aegle marmelos, Caesalpinia bonducella, Cardiospermum halicacabum, Corallocarpus epigaeus, Gloriosa superba, Andrographis paniculata	Devrayanadurga forests, Tumkur, Deccan Plateau	Destructive harvesting and medicinal use
Lichen genera Parmotrema, Everniastrum, and Rimelia	Ramnagar and other places in India	Commercial use
Arunchal Hopea Tree (*Hopea shingkeng*)	Arunachal Pradesh	Construction of house posts
Hubbardia heptaneuron	Karnataka	Construction of the Linganamakki reservoir
Sapria himalayana	Himalayas	Human Influx

Table 2. Endangered birds, causes for loss of biodiversity and places last found (Sources: Anil *et al*., 2014).

Species endangered	Place of interest	Causes
Seychelles Parakeet (*Psittacula wardi*)	Indian Ocean islands	Intense persecution by farmers and coconut plant owners.
Pink-headed Duck (*Rhodonessa caryophy llacea*) and the Himalayan Quail (*Ophrysia superciliosa*) (Adams *et al*., 2003)	Not reported	Annihilated, unrecorded
Great Indian Bustard (*Ardeotis nigriceps*), Bengal Florican (*Houbaropsis bengalensis*), Jerdon's Courser (*Rhinoptilus bitorquatus*), Forest Owlet (*Heteroglaux blewitti*), White bellied (*Heron Ardea insignis*) (IUCN endangered red list)	Not reported	Not reported
Narcondam Hornbill (*Aceros narcondami*) (IUCN vulnerable species list)	Not reported	Not reported
Sarus crane	Himalayas	Hunting
Great Indian hornbill *(Buceros bicornis*)	Arunachal Pradesh	Human traditions
Long-billed vulture (LBV: *Gyps indicus*), Slender-billed vulture (*Gyps tenuirostris*), and Oriental white-backed vulture, (OWBV: *Gyps bengalensis*)	Northern and Central India	Pesticides

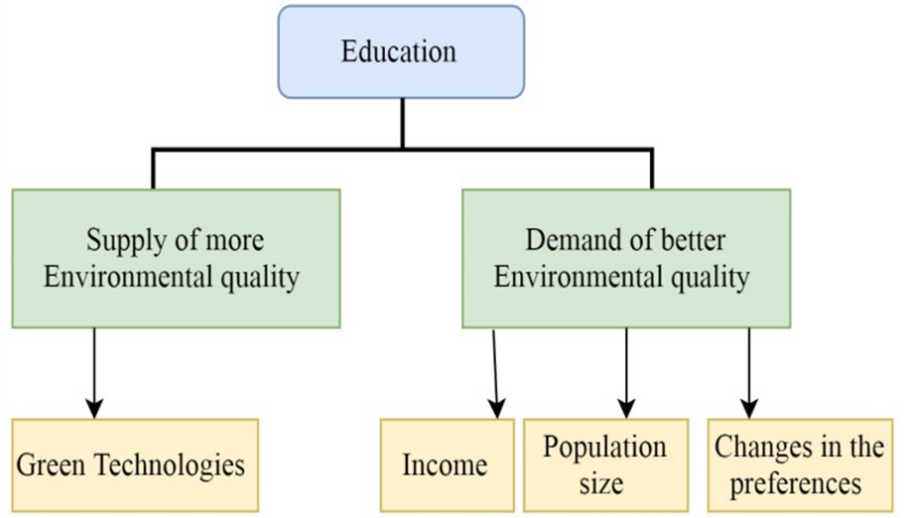

Figure 5. Impact of education on environmental quality.

- Purchase recycled products
- Conserve water
- Do not litter or throw waste into inappropriate places
- Conserve energy
- Join an awareness group
- Talk with others about the impacts of environmental degradation

The damage that we cause to the environment is currently not counted as a cost in economic and social terms. This lack of "environmental value" has allowed us to over-exploit "free" natural resources - which are, of course, not free. It has also led to over-production of cheap goods with very short life spans which are liberally discarded into the environment after use, and then new cheap goods are purchased and discarded again, this cycle goes on and on - affecting the planet's capacity to restore its environmental services in good time. We have to change this paradigm of our interaction with the environment. Certainly, don't have the right to exploit and destroy it without thinking about the future generations of humans and animals who will be hereafter us. We are drawing the flow diagram for the mitigation strategies and remediation of soil for the improvement of quality of soil shown in Figure 6, and different environmental component in Figure 7. All countries people have flowed the sustainable development goals their practice of conservation of environmental degradation shown in Figure 8.

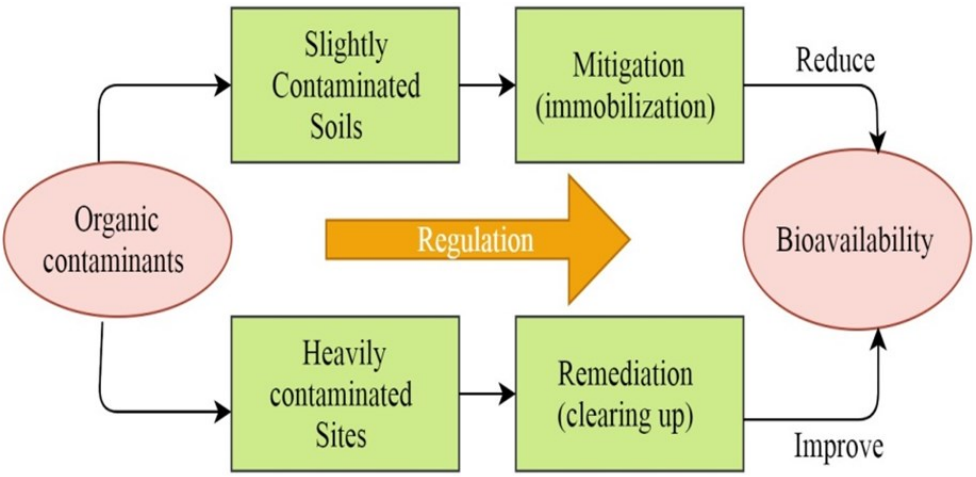

Figure 6. Strategies of mitigation and remediation for slightly and heavily contaminated soil.

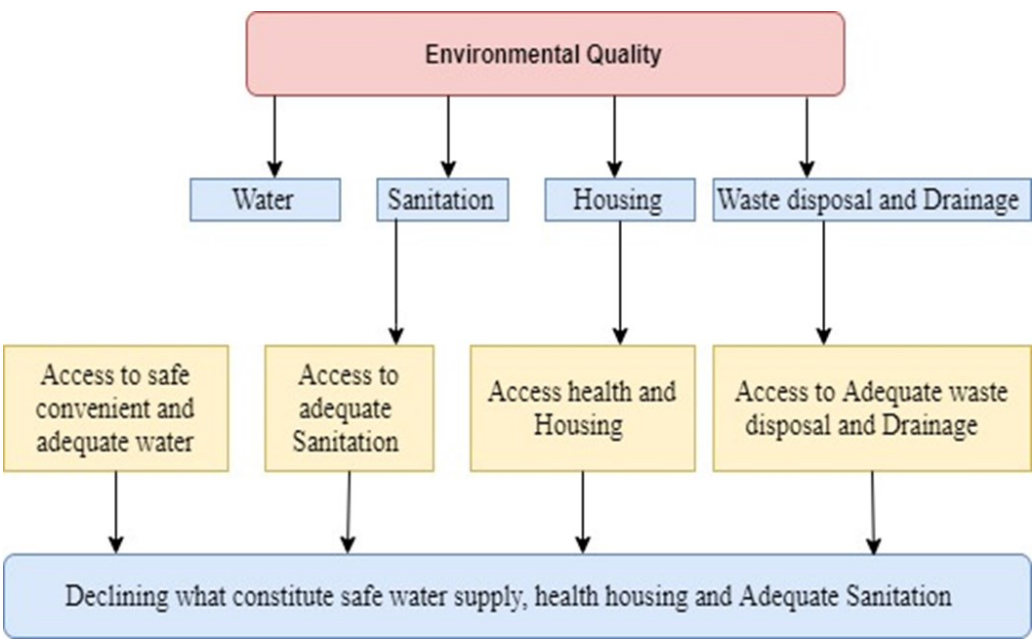

Figure 7. Different components of environmental quality.

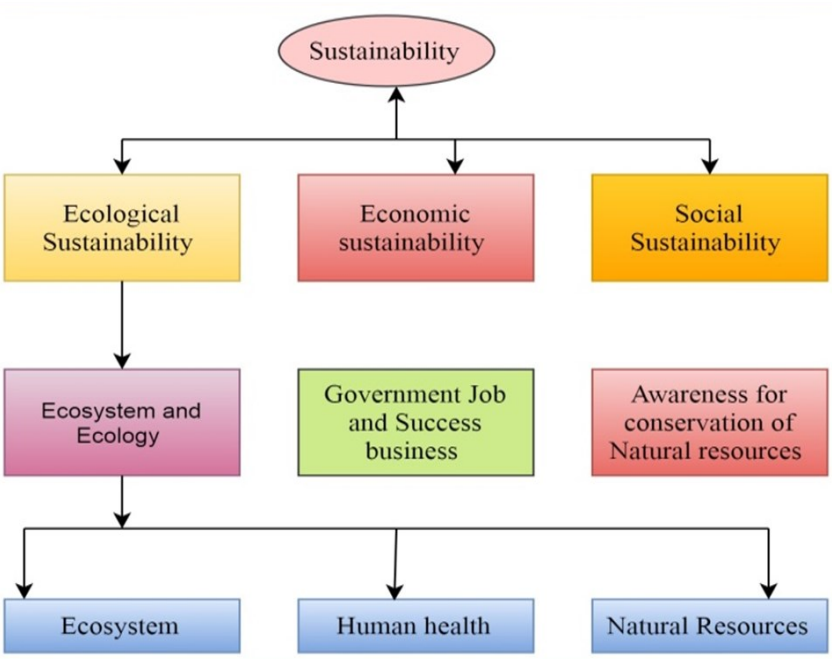

Figure 8. Sustainability components of human environment.

- Institutional instruction
- Direct control and regulation
- Economic instruction
- Technological measures
- Educational

In 2000, India's Supreme Court directed all Indian cities to implement a comprehensive waste-management program that would include a household collection of segregated waste, recycling and composting. These directions have simply been ignored. No major city runs a comprehensive program of the kind envisioned by the Supreme Court (Gov. of India).

Conclusion and recommendations

Environmental degradation is one of the most urgent environmental issues. Depending upon the damage, some environments may never recover. The plants and animals that inhabited these places will be lost forever. The primary causes of environmental degradation in India are attributed to the rapid growth of the population in combination with economic development and

the overuse of natural resources. In order to reduce any future impacts, city planners, industry, and resource managers must consider the long-term effects of development on the environment. Major environmental calamities in India include land degradation, deforestation, soil erosion, habitat destruction and loss of biodiversity. Economic growth and changing consumption patterns have led to rising demand for energy and increasing transport activities. Air, water and noise pollution together with water scarcity dominate the environmental issues in India. According to the World Bank estimate, between 1995 through 2010, India has made one of the fastest progress in the world, in addressing its environmental issues and improving its environmental quality. Still, India has a long way to go to reach environmental quality similar to those enjoyed in developed economies.

There are ways which can help to decrease the degradation of our environment. The most effective method to control pollution and depletion is through completing the legal framework. There are some drawbacks existing in contemporary law, which encourages malfeasances implicitly. Therefore, the government must enhance filling the gap in the legal system to avoid illegal activities. Amendment to provisions relating to the exploitation of natural resources is urgent since over-exploitation is the main reason for the loss of biodiversity. The government has long shaped its perception of economic, as well as social methods to solve the problem of pollution, but the implementation remains limited. Eliminating environmental pollution and recovering our ecology requires more than a single effort to be successful. Authority of all levels must involve not only in policy-making but also in the implementation and supervision of progress, so that the national long-term environmental target can be attained, resulting in sustainable development.

- The government can utilize economic reward and punishment system to encourage forestation.
- Purchase recycled products
- Conserve water
- Do not litter or toss waste into inappropriate places
- Conserve energy
- Join an awareness group
- Talk with others about the impacts of environmental degradation
- Be an advocate to save our planet!
- improve the quality of drinking water
- Prevent casual use of other unapproved sources
- Increase the quality of water used
- Improve accessibility and of domestic supply

- Improve hygiene
- Strict laws should be passed to control water pollution by individuals and different bodies
- Safety measures to be implemented to prevent oil spillage.
- Chemical waste should be converted to harmless biodegradable substances before being dumped into the rivers and streams
- Refuse should be burnt in an incinerator with built-inn devices to prevent water pollution.
- By making people be aware of the causes and dangers of air pollution
- By improving machinery so that more efficient fuel combustion occurs.
- Control by ventilation- suitable ventilation system should be provided in the kitchen of every house so that the gases produced by burning of wood, coal, oil, etc. can be exhausted very quickly
- Control by vehicle rules- the design of vehicle should be such that complete combustion of fuel takes place in the engine
- Control by forestation- the planting of trees should be planted at parks and public place

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