

# CAUSES AND CONSEQUENCES OF ENVIRONMENTAL DEGRADATION: A SURVEY STUDY

MD. ABU SAYEM\*

## ABSTRACT

The present study discusses some of major causes of the present environmental problems and how these affect us and the surroundings. By surveying some of most recent resource materials the essay analyzes certain background causes and their relevant consequences. In so doing, the study aims to create an awareness about the essentiality of environmental sustainability, and thus, to enrich the present discourses on ecological issues.

**Keywords:** Carbon emission, ecology, economic affluence, industrialization, military power, ozone layer, pollution, sustainability

\* University of Dhaka, Department of World Religions and Culture, Bangladesh sayemwrcdu@gmail.com

## INTRODUCTION

The present world is facing many problems in regard to the environment. Since Industrial Revolution in Europe (most probably from 1760 CE to 1850 CE) humans have been increasing their uncontrolled actions in the environment for making their life more comfort by depending on technologies. Before Industrial Revolution, humans never experienced such massive environmental problems as they are facing now. So, majority of scholars are of the opinion that Industrial Revolution worked as a turning point for the current environmental problems.<sup>1</sup> Environmental issues refer to harmful effects of human activities on natural environment. Human uncontrolled activities in the environment are responsible for environmental degradation, which is usually viewed as the deterioration of environmental ability through misuse and abuse of natural resources like air, water and soil including destruction of ecosystem. As human actions are not becoming in favor of natural system of the environment, the current world is experiencing more natural calamities than before<sup>2</sup>. *The Global Risk Report 2018* (World Economic Forum 2018), has put environmental issues like “extreme weather events”, “natural disasters” and “failure to climate-change mitigation and adaptation”, at the top of the global risks. Environmental problems like global warming, pollution (of air, water and soil), deforestation, ozone layer depletion, climate change, natural disaster, loss of biodiversity, melting polar ice, rising sea level, etc. are affecting our planet earth seriously.

1 After the Renaissance in Europe, European scholars developed the concepts of humanism and secularism, and then emphasized the rights of human beings over other animals and other entities. From then on, a negative attitude to our natural world is noticed in human thought and action. During the European enlightened age between the seventeenth and eighteenth centuries scholars were mostly busy with reason-based material knowledge. They could not produce guidelines about the preservation of the natural environment. Something worse happened in the field of the environment with the Industrial Revolution in England, which is considered the beginning of the era of environmental degradation by man-made causes, though it is seen as a turning point in the history of modern economic development. Afterwards, European colonialism and imperialism spread the environmental degradation all over the world through their power and destroying the traditional sympathy of people toward the natural environment. Thus, since the Scientific Revolution, science has been giving comforts to human life, but it could not provide any moral guidelines to preserve and protect the environment, rather in most cases it has been a cause of environmental degradation. Still now human beings are dreaming to overcome nature utilizing science and technology. But it will not be their victory; rather it will carry the complete destruction of the environment.

2 According to *the World Risk Report 2012* (United Nations University, 2012), environmental degradation increases rapidly disaster risk worldwide. The report reveals that environmental degradation significantly reduces the ability of the earth for coping up with disaster risks. The balance sheet of the report, based on the analysis of ten years from 2002 to 2011, shows alarming situation. In the reported time it is evident that already 4,130 disasters happened on the surface of the earth where more than one million people died with the economic losses of at least 1.1195 trillion US dollars.

In *Major Environmental Issues Facing the 21<sup>st</sup> Century* (1996), Mary K. Theodore and Louis Theodore note fifty environmental problems facing the 21<sup>st</sup> century (p.1). Needless to say, due to multi-form pollution of air, water, and soil, the natural environment is getting more higher temperature, which causes climate change, and this climate change affects the natural environment adversely. In the preceding passages, I will give a short account of present-day environmental problems by noting some dominating sixteen environmental issues along with their most relevant causes and consequences in order to make my readers understand how our surrounding natural environment is being degraded by human uncontrolled activities in the environment.

## I. CLIMATE CHANGE AND GLOBAL WARMING

Climate change refers to the changes in weather over a period of time. This change proceeds toward hotter temperature in the atmosphere. Climate change presents us a global warming. Since the inception of temperature recording in 1850 our world has been getting hotter (Brohan, Kennedy, Harris, Tett & Jones 2006). Global temperature is now at the highest level in 4000 years' calculation (Gillis 2013). According to NASA's Goddard Institute for Space Studies (GISS), the world is now about one degree Celsius hotter than pre-industrial average (NASA Earth Observatory, n.d.). In 2016, in an open letter 375 members of the U.S. National Academy of Sciences including 30 Nobel laureates express their collective opinions that human activities are causing climate change and they should take necessary steps for environmental sustainability (Abraham 2016). Furthermore, scientists state in the same letter that climate system is now crossing tipping points. To their view, the rapid warming of the earth undoubtedly increases the series of risks human beings may not tackle. Their such anxiety is resonated in a report recently published by UN Intergovernmental Panel on Climate Change (IPCC). In a report, the world leading climate scientists warn humans that they have a dozen of years to keep the global warming at a targeted level of 1.5 Celsius, otherwise they may face an adverse climate catastrophe (Watts 2018; IPCC 2018). In their view, an urgent change is required to reduce the possibility of extreme heat, drought, floods, storms, etc. (Ibid.).

Why is such change in the global temperature happening? The cause is explicit, it is due to uncontrolled human activities in the environment. The cultural transformation of human society from pastoral stage to industrialized phase brought climate change on the surface

of earth. Instead of relying on bodily power of humans, people now depend on power of machines and technologies for producing commercial goods and other things. Huge amount of fossil-based energy sources like natural oil, natural gas and coal are being used as fuels for running these machines and technologies, which emit indiscriminately huge amount of carbon dioxide gas in the atmosphere. Natural world cannot adjust this emission of carbon dioxide by its natural process because it has already superseded that system. Because of such unadjusted carbon dioxide our earth planet is getting hot, ozone layer is depleting, polar ice caps are melting, and sea level is rising. Concurrently, indiscriminately consuming fossil-based energy sources are causing energy crisis for future generation. Similarly, other natural resources, for instance water, are being used in an unsustainable way that future generation cannot have sufficient resources for meeting their basic needs.

If global warming continues, at least there will be two major effects: 1) there will be no barrier to protect living forms on earth from ultra-violet rays coming from the sun-light; and 2) hundreds of thousand people will be climate refugees because of sea water rising. Ultra-violet rays will cause eye and skin cancer, will burn plants and trees, and will degrade the quality of water and soil. Melting ice-water will cause sea level high and will submerge sea coastal areas, which will eventually force inhabitants therein to leave for other places and many habitats of other species will be destroyed. If humans fail to tackle the climate change and global warming issues, an environmental catastrophe will be inevitable. It will be totally impossible to escape from such pervasive destruction.

## 1. Pollution

Major forms of pollution are air pollution, water pollution, soil contamination, noise pollution, light pollution, thermal pollution, plastic pollution, radioactive contamination, littering and landfills, etc. A brief description on their causes and effects on the environment is given below.

Air pollution occurs when gaseous pollutants like carbon dioxide, methane and hydrofluorocarbon are released into the air (National Geographic, n.d.). Carbon dioxide comes from combusting fossil fuels – coal, natural oil and natural gas burnt by motorized vehicles, factories, power plants, incinerators, etc. (Mackenzie 2016). Though methane comes from some natural sources, dumped wastes also produce this gas. Hydrofluorocarbon gas is used in air-conditioners and refrigerators. In regard to trap heat in the atmosphere, methane is twenty time (Environmental Protection Agency cited in Newton 2018; One Green Planet, n.d.) and

hydrofluorocarbon is thousand time more powerful than carbon dioxide (Mackenzie 2016; Schlossberg 2016). These gaseous substances increase greenhouse gases, damage ozone layer, cause acid rain, attract ultraviolet radiation and thus, accelerate climate change by warming the globe. Air pollution creates an artificial ozone layer, which is called smog, at the ground level in the atmosphere. Smog happens when emissions from combusting fossil fuels react with sunlight (Mackenzie 2016). Air pollution carries tiny particles of chemicals, soil, smoke, dust, etc., in the air, which is known as soot (Ibid). Both smog and soot can damage eyes, skin, immune, nervous, endocrine systems, reproduction functions, and activity of kidney, and even can lead to cancer (Mackenzie 2016; Spillane 1996: 82-83). Thus, human health and animal life are seriously affected by air pollution.

Water is polluted massively by waste-water discharged by industries into surface water bodies – creeks, canals, rivers and seas. An industrial by-product, mercury poisoning, affects water quality seriously. Drinking of water contaminated with mercury poison may damage central nervous system and reproduction process. Such contaminated water can make fishes poisonous, and by turn, eaters of those fishes can easily be poisonous. Plants suffer severely and even can die by absorbing this kind of poisonous water. Dumped places of industrial waste, house-hold waste, medical waste and urban waste lead to a toxic runoff to ground water and nearby surface water sources. When surface water bodies like creeks and canals are contaminated with such toxic water seeping out from landfills, vermin and bacteria are attracted to come there and breed their offshoots, and they spread infectious diseases from there. Likewise, agricultural pesticides, herbicides and chemical fertilizers make nearby water bodies poisonous. Drinking of such poisonous water affects seriously functions of kidney and liver, and leads to cancer. Some portions of garbage come to oceans and affect ocean creatures adversely. For instance, fishes ingest mistakenly some pieces of such intoxicated substances and sooner they fall in sick, and eventually they affect those who consume them. Water may be contaminated with radioactivity from nuclear power plants and nuclear weapons manufacturing industries. Such polluted water is very dangerous for any living organism. Dumped inorganic chemicals cause water poisonous; such contaminated water damage nerve system. Similarly, thermal pollution, oil spills, algae, mining, organic minerals, organic minerals (lead and arsenic for instance), etc. pollute water in different ways. Needless to say, water pollution kills organisms that depends on water bodies, causes death of aquatic animals, disrupts natural food chains, brings many diseases to human health and animal life, works as a contributing factor for acid rain, and thus, proceeds to the destruction of the ecosystem. (All

About Water Filters, n.d.; E-School Today, n.d.)

Soil is contaminated with industrial waste, chemical fertilizers, pesticides and herbicides. Soil contamination disrupts soil fertility, produces toxic dust and alters soil structures. It causes death of soil organisms, soil erosion, soil salinity, and thus, to make soil unsustainable for farming. Soil pollution has a serious bad effect on physiological health of animals and plants. For instance, plants are directly affected by absorbing toxic chemicals from contaminated soil, and then, animals are affected by taking fruits, grains and vegetables from the affected trees, crops and plants. Thus, soil pollution disrupts ecological balance through disturbing the natural food chain from plants to animals. (Everything Connects, 2013; Hammond 2017; Rinkesh, n. d.)

Noise pollution refers to unwanted sound released by machines used by industries, motor vehicles, and construction activities (Rinkesh, n. d.). Noise pollution disrupts the natural rhythm of life both for humans and non-human animals (World Health Organization, n.d.). It affects physiological and psychological health (Goines & Hagler 2007). Loud noise damages ear drums and hearing capacity (Ibid.). Studies reveal that excessive and loud noise cause aggressive behavior, hypertension, depression, stress, fatigue, sleep disturbance, etc. (Ibid.). Due to noise pollution non-human animals also suffer from hearing loss. Reproduction capacity of species are reduced by noise pollution.

Artificial light creates light pollution on earth. Modern humans use excessive light in factories, city-streets, houses, offices, markets and sport-venues. Apart from their basic necessity, people are habituated with over illumination; but they cannot realize that even a very careful use of light also creates light pollution. Artificial light disrupts eco-systems. Some scientific researches suggest that many creatures, especially nocturnal animals, are deadly affected by artificial light (Frank 1988). Animals and plants are dependent on earth's daily cycle of light and dark for smoothly conducting their life-supporting behaviors like sleep, nourishment and reproduction (Rich & Travis 2006). Light at night time in cities and other areas make an obstacle to such of this natural system.

Thermal pollution happens when power plants and many other factories like petroleum refineries, paper mills, chemical plants, steel mills and smelters discharge hot or cool water into nearby water bodies – canals, rivers, lakes, seas, etc. After use, water is returned to the natural environment with a higher or lower temperature, which seriously affects aquatic organisms because they need specific temperature for their growth, reproduction and disease resistance power. Thermal pollution, thus, forces aquatic organism to migrate from their

places to comparatively sustainable places, which eventually brings changes in biodiversity. (Arcadia Power, n.d.; Rinkesh, n.d.; Earth Eclipse, n.d.)

Plastic pollution is a result of plastic products. Due to easily carriable, inexpensive and durable, people prefer to use plastic products (Guem 2018). Every year about three hundred tones plastic products are being consumed by humans (Plastic Oceans Foundation, n.d.; Ritchie & Roser 2018). After use, they discharge these materials in the soil and water bodies. The discharged plastic substances severely pollute soil and water by affecting wildlife habitat, wildlife and humans (Rinkesh, n.d.). It interferes the natural food chain (Ibid.). When smaller animals eat plastic particles accumulated in soil and water, they are reacted by intoxication of plastic materials; and then they pass this reaction to the higher animals and even humans through an interrelated and interdependent connected within the food chain. For instance, if fishes are contaminated by plastic toxic materials, humans will easily be affected by eating those fishes. Floating plastic debris on water bodies affect adversely aquatic organisms. They cannot grow and survive in their own ways. When the plastics are burned for production purpose, poisonous chemicals are released into air (Ibid.). It causes respiratory problems for humans and non-human animals (Ibid.). Biological growth and reproduction process are affected severely by plastic pollution. It also keeps global environment warm.

Radioactive contamination comes from nuclear power plants, nuclear weapons manufacturing factories and deployment of nuclear arms. It refers to the presence of undesirable radioactive substances on surface. When radioactive byproducts of a nuclear reaction are dumped in soil or washed in water, it pollutes the environment with radioactive substances. If soil is contaminated by radioactive substances, the harmful radioactive ingredients will pass into plants and cause genetic alteration of plants. Eating fruits or leaves of those contaminated plants will bring a serious health to eaters. As plants are the base of food chains, their contamination means disrupting the entire food chain. Similarly, if a water source is contaminated by radioactive substances it will affect seriously the whole aquatic food web of that water source. Besides, the radioactive contamination has a direct effect on human health. Radioactive rays cause irreparable damage to DNA molecules and lead to a life-threatening condition. People with heavy radiation exposure are at a very high risk for skin cancer, lung cancer and thyroid cancer. Children of nuclear radiation affected parents carry genetic mutation at their birth and they pass on it to their future generations. The incidents of Hiroshima and Nagasaki prove such tragedy. (HelpSaveNature, 2017)

Littering refers to the improper way of releasing waste products in an inappropriate place.

Illegal dumping and litter attract vermin and serve as breeding place for bacteria. Hazardous item of rubbish and carelessly dumped cigarette butts are potential fire hazards. Scattered garbage damages water ways and harms eco-system by travelling to nearby areas like fields, ponds, canals, rivers, etc. Thus, indiscriminately disposed debris pose disturbance not only for human life but also for wild-life. (JB Green Team, n.d.)

Landfill is a traditional way to dispose waste materials by burial. Rotten food items and other organic wastes create methane and carbon dioxide gases. According to a report of Environmental Protection Agency (cited in Newton 2018), methane holds twenty times more heat in atmosphere than carbon dioxide. It increases greenhouse gas and keeps global temperature higher. The report of Romanian Ministry of Environment and Forest (cited in Newton 2018) shows that a landfill site reduces thirty to three hundred species per hectare. Due to transformation in the site, some species (some mammals and birds) are replaced by other species like rats and crows. Similarly, some plants replace some other plants in a landfill site. Some toxic chemicals seep out from the landfill into underground water. When such leaching chemicals come into water sources, water is reduced from oxygen and no longer can support aquatic organisms. Surrounding areas of a landfill reduce soil quality due to the mixture of toxic chemicals and degraded organic materials. The natural landscape of a nearby area is degraded by a landfill site. Gradually, this area transforms into a breeding ground of bacteria and vermin. Human health issues like birth defects, cancer and respiratory problems may have some potential links with landfill sites. (Newton 2018)

## 2. Deforestation

According to a report of the United Nations Framework Convention on Climate Change (UNFCCC), about eighty percent causes of deforestation is agriculture (UNFCCC 2007: 81). People are clearing trees to transform forest areas into farming lands for producing more foods. They are building roads through the forests, logging trees for fuel woods and paper production. Rapid urbanization is pushing humans to cut more trees for building houses therein. Apart from these contributing factors, wildfire also contributes to deforestation. If deforestation continues at the current rate, it may vanish world's rain forests just within a century (National Geographic, n.d.). As a result of deforestation, we are losing about 18.7 million acres of forest every year (World Wildlife Fund, n.d.; Bradford 2018), the quality of soil structure is damaging, soil erosion is occurring, amount of fresh water is decreasing, and biodiversity is disappearing. Deforestation is contributing to global warming and climate

change. According to some assessment reports of World Wildlife Fund (WWF), fifteen percent world's greenhouse emissions are coming from deforestation (Ibid.). Because, lowering forest means increasing greenhouse gases in the atmosphere. In a natural way, trees extract groundwater through their roots and then release it into the atmosphere by their leaves. With this process trees works in water cycle. Trees absorb the carbon dioxide released by animals and release Oxygen respired by animals. Cutting trees means reducing life-supporting natural system. It has direct impact on eco-system and biodiversity. Tropical rain forests cover about thirty to thirty one percent of our planet earth, where eighty percent of earth animals (around eight hundred million earth inhabitants) live in (National Geographic, n.d.). According to the reports of Millennium Ecosystem Assessment, due to deforestation habitats and eco-system are declining day by day; as a result of which millions of species and biodiversity are disappearing. According to an estimation of Rainforest Statistics Facts, every single day we are losing 137 plant, animal and insect species, which equates to fifty thousand species a year (Rain Tree, n.d.; Save the Amazon Coalition, n.d.). These are, of course, very alarming effects of deforestation.

## 3. Depletion of Natural Resources

Natural resources are not infinitive sources for limitless use. We are living in a world of limit in regard to resources. The Living Planet Report 2012, published by WWF, reveals that humans are putting a tremendous pressure on nature. According to the report, "we are using 50 per cent more resources than the Earth can provide" (WWF 2012)<sup>3</sup>. The ecological footprint<sup>4</sup> reveals a similar truth that "a consistent trend of overconsumption" causes exploitation of natural environment (Alpay, Özdemir & Demirbas 2013: 2-3). Natural resources are broadly classified into two basic categories – renewable resource like wind, sunlight, water, etc. and non-renewable resource like natural oil, natural gas, coal, etc. The way modern human civilization is consuming natural resources any pre-modern nation did not do. If we cannot control such uncontrolled utilization of natural resources, future generations will face serious scarcity of these resources. Since industrial revolution around 1760 in England, humans have

<sup>3</sup> The report indicates, "if all of humanity lived like an average resident of Indonesia, only two-thirds of the planet's bio capacity would be used; if everyone lived like an average Argentinean, humanity would demand more than half an additional planet; and if everyone lived like an average resident of the USA, a total of four Earth would be required to regenerate humanity's annual demand on nature" (cited in Alpay, Özdemir & Demirbas, 2013: 3).

<sup>4</sup> It is a measurement of tracking demands, consumptions and wastes of humans by comparing with the natural system of production and absorption especially in the earth's biosphere capacity (WWF, n.d.).

been increasing energy dependency on coal, natural gas and natural oil to fuel factories and motorized vehicles. Some studies predict that before reaching the next century the storage of nonrenewable natural resources like coal, oil, gas and uranium etc. may be finished (Sing 2015). Other industrial metals like gold, copper, zinc, silver etc. are going to be empty within the next fifty years (Desjardins 2014).

Humans seem very careless about responsible use of limited fresh water. This limited water is being used in an unsustainable way for drinking, cleaning, irrigation, and producing industrial products. According to United Nation's Food and Agricultural Organization (cited in The World Counts 2014), from available fresh water, 70% is used in agriculture, 20% in industries and 10% for human consumption. Only 2.5% of the world's water is drinkable and 70% of this fresh water is frozen water (Ruz 2011), which is being melted and merged with sea water due to global warming. Again, drinkable surface and ground water sources are being contaminated with toxic substances seeped out from landfills along with industrial and urban runoffs. If this limited water is depleted or is contaminated fully with poisonous substances: What will happen for humans? Can money or any form of economic development substitute this essential need? Is it possible for animals and plants, which depend on fresh water, to live any more without this limited water?

Resources of forests are very essential for wildlife and biodiversity; but these resources are being depleted quickly by multi-anthropogenic interferences like logging trees and hunting wild animals. Due to urban sprawl and different sorts of development works inside or nearby the forest areas, forest resources are being damaged adversely. According to the World Counts (2014), half of earth's forests is already destroyed; and as a matter of fact, lot of species are forced to extinct. If humans do not take timely precautionous measurements to protect resources of forests, they will have to face a fatal consequence for depleting forest resources.

Lands are the primary grounds for food production, but unsustainable agricultural activities in lands are decreasing the capacity of lands for producing foods. Intensive farming functions with chemical fertilizers, pesticides, and herbicides, etc. damage natural fertility of lands, soil structure and their production capacity (Gomiero 2016). On the other hand, due to urban sprawl, development constructions, building roads and manufacturing factories, farming lands and even wetlands which serves for eco-systems and promotes biodiversity are being reduced day by day (Yale University, n.d.).

Fish and other sea creatures supply proteins to human body. Modern humans are so greedy, commercial and profit-oriented; that is why, they are hunting fishes more than actual

needs (Vince 2012; Jetson 2014). According to a catch data report 2006 published in *Science* (cited in National Geographic 2010), some scholars predict that if the present rate of overfishing continues world's fisheries may disappear after 2048. Likewise, they are also hunting other ocean creatures for their economic benefits. In the course of hunting fishes from the rivers and seas, many other aquatic creatures are also trapped in nets along with fishes and die immediately (WWF, n.d.). In this way, anthropogenic actions in the world of aquatic creatures and unjust behaviors of humans with them reduce their numbers (National Geographic 2010; WWF, n.d.; Vince 2012). On the other hand, water contaminated with toxic substance and plastic pollution pose a serious threat to aquatic organisms including fishes (Denchak 2018; Jowit 2007).

## II. LOSS OF BIODIVERSITY

Anthropogenic interferences in eco-systems lead to the loss of biodiversity. Human activities – pollution, deforestation, exploiting natural resources by intensive farming alongside over fishing and hunting, converting lands for building roads and houses, exploiting the species, changing the biogeochemical cycles, introducing genetically modified organisms and exotic species into natural environment – are affecting biodiversity adversely. Climate change and global warming, which are a result of human uncontrolled and unjust activities in nature as mentioned earlier, cause the destruction of biodiversity by keeping various animals and plants species at increasing heat temperature and adverse weather. Thus, different kinds of animals and plants, that work in ecosystem with their unique functions and beauty, are becoming extinct at an unprecedented way. Both terrestrial and marine lives are being affected. One hundred fifty species are decaying per day (Gabriel 2007). Other studies estimate that each year we are losing one hundred forty thousand species (DeFranza 2011). Such loss in biological diversity is making the environment imbalanced and weak in regard to environmental sustainability and sustainable development. Loss of biodiversity means loss of organisms and loss of organisms implies destruction in a natural process where organisms work to keep soil fertile, absorb pollution, decompose waste materials, and pollinate crops. According to a recent study, if natural services are compared with economic price, it will be an average estimation equivalent to US\$ 16-54 trillion (Costanza et al 1997); but such natural service we are getting free of cost to smoothly lead our lives. Needless to say, the wellbeing

of human life depends on the sustainable ecosystem, which relies on biological diversity. If biodiversity continues to decay, it will risk human food security, destabilize disease-resistance power, cause more unpredictable extreme weathers, and decline livelihoods.

### III. PUBLIC HEALTH PROBLEM

Environmental issues – climate change, global warming, pollution, deforestation, loss of biodiversity, depletion of natural resources, waste disposal, hazardous substances, unsafe public species, chemical exposures, ultraviolet radiation, etc. – affect all the physical, psychological, chemical and biological factors of humans (World Health Organization cited in Rinkesh, n.d.). As a result, multi-dimensional diseases including respiratory infections, gastric ulcer, headaches, diabetes, cancers, etc. are increasing day by day (Remoundou & Khoundouri 2009). According to the report of WHO, more than one hundred diseases are directly related with environmental issues (Vidal 2016). The same report estimates that more than twelve million deaths are happening each year due to environmental problems, among which two million are children (Ibid). According to a statistical calculation, out of four deaths one is directly connected with environmental problem (Ibid).

### IV. HUMAN OVERPOPULATION

Currently, more than seven billion humans are living on the surface of earth. By the end of this century, the number of human populations is projected to reach more than ten billion (United Nations' Department of Economics and Social Affairs 2017). Humans are increasing their number faster than the earth's capacity of production (Cohen 1995). The more humans, the more pressure on the natural resources in regard to more foods, cleaned water and air, and energy. Increasing number of human populations are posing a serious challenge for our planet earth of limit. In meeting their basic needs humans are clearing forests, reducing wetlands, labelling mountains, degrading habitats of organisms, depleting fossil fuels and other minerals, polluting air and water adversely, destroying the quality of soil and its natural structures by intensive and excessive farming activities, etc. (Everything Connects, n.d.). Thus, over human population has a direct relation to the present unprecedented environmental crisis.

### V. URBAN SPRAWL

Modern humans like to live in urban areas. The way they are expanding cities on the surface of earth, it is harming the environment and ecosystem. Urban sprawl means transforming more lands to dwelling places for city inhabitants alongside construction of roads and other necessary things for human uses. In meeting these demands humans are destroying nearby forests, woodlands, and wetlands indiscriminately including agricultural lands; as a result of which the natural habitats of wildlife and ecosystems are degrading with the expansion of cities. Some studies reveal that one million acres of land are being destroyed every year by urbanization process (Everything Connects 2013; Sierra Club, n.d.). City dwellers are polluting soil quality and structures by landfilling urban toxic disposals. Modern cities are dependent on motorized vehicles for transportation and they are more consumers of energy sources than village people, so, smog and soot are added at atmosphere by polluting air quality. City dwellers consume more water and discharge used water in drain and sewerage, which mixes with toxic water released from factories, and from there some polluted water go to the underground source of water by sweeping out and some other polluted water come to nearby surface water bodies. Thus, city runoff pollutes surrounding wetlands, canals, streams, rivers and seas. So urban sprawl has a contributing factor to the current environmental problems.

### VI. NATURAL DISASTERS

Natural calamities like hurricane, tornado, typhon, storm, heavy rainfall, drought, flood, mudslides, landslide, earthquake, volcanic eruption, wildfire, tsunami, etc. have many consequences on the environment. These unexpected events are mostly unpredictable, and humans have no hands to control. Natural disasters can change the total structure of an area whether it is inhabited by humans or non-human animals; even animals themselves including humans can directly be affected by some of natural calamities. Needless to say, habitats of species and ecosystems can be collapsed by any one of such calamities. (Knap & Rusyn 2016)

#### 1. Desertification

Due to overgrazing, unsustainable way of farming, deforestation, overpopulation, climate change, etc. many dry lands of the world (especially in central Asia and interior Africa) are

converting to barren land. Studies done in this point claim that one third of earth's surface is going to be desert soon because of human uncontrolled activities and tremendous pressure on arid lands. In the process of desertification, soil gradually lose fertility and nutrients, which are essential for vegetation and eco-systems. On the other hand, it causes erosion due to poor quality of soil in the form of dust, which can easily be blown by wind storm or washed away by runoff of rainfall. Such dust substance of soil pollutes both air and water. At a stage, humans and animals are forced to leave such places for another suitable ones to lead their lives. (Warren 1993; Green Tumble 2016)

## 2. Acid Rain and Ocean Acidification

Acid rain occurs when gaseous pollutions (especially Sulphur dioxide and nitrogen dioxide compounds) react with the water molecules in atmosphere (EPA, n.d.; Jakuboski 2011). Modern factories, motorized vehicles and power plants fueled by fossil-based energies sources – coal, gas and oil – are releasing regularly huge amount of Sulphur and nitrogen gases in air (EPA, n.d.). Primarily these gaseous compounds are causing acid rain on the surface of earth, which affects everything from soil to water (Ibid.). It damages the growth process of plants and trees by washing away the protective film on leaves (Jakuboski 2011). Acid rain acidifies soil and water bodies.

According to NASA Earth Observatory (2011), about thirty percent of the carbon dioxide in the atmosphere comes into the oceans. So, to increase carbon dioxide in the atmosphere means to increase carbon dioxide in the oceans. When carbon dioxide enters into the oceans, it makes sea water more acidic and hinders the growth of calcium carbonate minerals which are essential for some aquatic animals like fishes, sharks, tortoise, dolphin, crocodile, etc. to produce shells and skeletons for them (NASA Earth Observatory, 2011). So, the life of such sea creatures is at a serious risk because of ocean acidification. Other animals, including humans, who consume these animals will also be affected. Thus, ocean acidification hampers the food chain (EPA, n.d.). Ocean ecosystems including coral reefs are also being damaged by ocean acidification (Ibid.).

## 3. Industrialization

Arguably, Industrial Revolution brought a significant impact on economic development, but unfortunately, it has a direct relation with the present environmental problems (Environment Insider, n.d.; Patnaik 2018). Since Industrial Revolution manufacturing factories have been

polluting the environment by emitting carbon dioxide in air, releasing disposals in soil, and causing runoffs of toxic chemicals to water bodies. Natural resources are being exhausted by industries because manufacturing factories depend on raw materials from the land, water, forest, and fossil fuels – natural gas, natural oil and coal. Needless to say, industrialization process causes depletion of natural resources, leads degrading habitats of species, and thus, destroys ecosystems. Besides, industrialization is also responsible for urbanization because it invites people from rural areas to work in factories (Investopedia 2018). Village people come to industrial areas for getting more payments and then start to live nearby places. At the same time, this process occurs two opposite things; the first-one is to neglect village life habit and traditional agricultural system which were, more or less, environmentally friendly system, and the second-one is to expand an existing city and to build more industrial cities with artificial equipment which is alien to natural system.

## 4. Mining

Mining refers to the extraction of minerals and other solid materials from the storage inside earth (Chepkemoi, n.d.). Natural resources including coal, natural oil and natural gas are brought out from the reserve under the surface of earth. In modern civilizations, mining companies play a vital role in modern economic development, but at the same time the mining activities contribute huge damage to the environment. In a forest area, mining destroys habitat of wild species; in an agricultural land, it disrupts vegetation to grow; in a locality; it produces dust pollution; and in a river or sea, it pollutes water. The whole ecosystem is affected by mining (Kinhal, n.d.). Thus, mining keeps biodiversity at a very risk.

## 5. Degraded Ecosystem

The entire ecosystem is seriously affected by human uncontrolled activities in the environment (Plesnik, Hosek & Conde 2011; Stephenson 2006). Consumerism based modern life-style are overusing natural resources and polluting the air, water, and soil. For short-term economic benefits humans are transforming forests and wetlands into human useable purposes like agriculture, roads, highways, airports, sea ports, land ports, buildings, mining, cities, industries, etc.; as a result, ecosystems of those affected areas are disappearing, and hence, biological diversity cannot survive in those regions. Similarly, water bodies like creeks, canals, rivers, bays, seas, oceans, etc. are being contaminated by toxic chemical substance released by factories and runoffs from urbans and agricultural lands. Such polluted water



cannot provide life-supporting substance for aquatic organisms. Ecosystems in the oceans including coral reefs are now at a serious risk. The greedy fishermen are reducing the richness and variety of fish species by overfishing through using an inappropriate fishing technique. By using and increasing their dependency on fossil fuels like coal, natural gas and natural oil, modern humans are polluting air affecting greenhouse gases at the atmosphere, which increases global temperature and leads to climate change. Both terrestrial and aquatic organisms live in a specific temperature. When temperature becomes higher and higher than expected temperature or there is a change in temperature by global warming caused by carbon dioxide gases emitted especially by factories, motorized vehicles and other anthropogenic interferences, some species from plants and animals cannot survive, or they are forced to leave their dwelling places for comparative more sustainable places. So, increasing heat in the temperature, water contamination, deforestation, reducing wetland, intensive farming with pesticides and herbicides, overfishing, overexploitation of natural resources, etc. are degrading ecosystems of the earth (World Environmental Library, n.d.).

## VII. NUCLEAR POWER PLANTS

Though nuclear power plants do not produce directly carbon dioxide in the air like fossil fuels-based power plants, these have many other problems. Usually these power plants are located at a nearby lake, river and sea. In construction of the power plants, some natural habitats of plant and animal species are destroyed, as a result of which the ecosystem of the respective area is collapsed. For cooling the plants, water is pumped from the nearby water body and after the water is used it is released to the same water body with warm temperature, which kills some of aquatic species living there because they cannot survive in warmer water. Nuclear power plants cause increasing sulfur dioxide in the air, which leads acid rain; and acid rain contaminates surface water sources, damages soil structures, and disrupts the growth of plants and trees. Nuclear power plants emit radioactive waste, which remain active for a long time (Kivi 2018). This waste is a serious concern for the environment. Currently, radioactive wastes are stored inside the power plants' area; but there is an urgency to bury these wastes inside the soil (Ibid.). If these are dumped, the surrounding environment will be affected adversely. Nuclear power plants continuously release low-level radiation in the air. This radiation increases the possibility of cancer among people living nearby areas and even

can damage their DNA (Ibid.). Similarly, wildlife, plants, and trees can be affected seriously. In a word, the entire ecosystem is directly and indirectly damaged by radioactive wastes and radiation discharged by nuclear power plants. There is always a risk of nuclear power plants' accident, which can cause an environmental disaster (Ibid.). With all these problems of nuclear power plants in mind, environmental activists argue that the nuclear power plants carry more dangerous risk than their benefits. So, in cost-benefit analysis it is not safer, greener, and sustainable methods to produce electricity.

## VIII. INTERFERENCE IN MATTER CYCLES

In many ways, humans are interfering in natural cycle of matter. They are changing and contaminating hydrological cycle, carbon cycle, nitrogen cycle, phosphorus cycle, Sulphur cycle, etc. Chemical substances (for example, fertilizers, pesticides, herbicides, etc.) used in agricultural lands are contaminating rain water, which reaches the groundwater without being enough filtered. Vegetation can infiltrate rain water; but people are chopping down plants and trees for commercial use of the land. Again, intoxicated runoff from cities and industries pollute surface water bodies from which some portion of water goes to underground water level. Thus, underground water alongside other water sources are being intoxicated, salted, contaminated and polluted. (Lenntech, n.d.)

In the environment there is a specific amount of carbon and nitrogen. But fossil fuel based modern civilization is constantly increasing that amount with their increasing activities in nature (Ibid.). The way modern humans are producing these substances in the environment, natural system cannot absorb these. If there were more vegetation on earth and if humans would control their actions in nature, the existing trees and plants could have absorbed. But people are causing deforestation; so, that possibility has faded away.

## CONCLUSION

The preceding discussion shows that the present environmental issues are a result of human uncontrolled activities in the environment. From the inception of human race on earth the environment has been degraded; but until the Industrial Revolution, this degradation was not in a massive form, it was at a recovery level which could be automatically filled up in a natural process. After the Industrial Revolution, when people start to utilize fossil fuels as energy to run machines, the environment becomes polluted in a way that cannot readjust itself by the natural process. Science and technology gave humans more power to use natural world brutally for comforting human life. At the same time, economic development of humans is given utmost priority and everything of natural world is seen from a short-term economically development perspective, where an environmental sustainability question is no use. Being obsessed to economic progress, modern humans indiscriminately emit carbon dioxide, chop trees, cut down mountains, block river flows, produce chemical fertilizer and pesticides, cultivate genetically modified crops and foods, pollute air, contaminate water, degrade soil quality, acidify oceans, destroy forest areas and wetlands, just to mention some of human activities in the environment. All these activities cause climate change, global warming, ozone layer depletion, sea level rise, smog, soot, and ecosystem disruption, including many acute health problems of animal and plant species. If human activities are not controlled immediately, they may face soon an environmental catastrophe. As a consequence, the entire natural system of the earth surface may be collapsed, which can support no more any living form on earth. So, considering such a possible dangerous situation, humans should modify their current activities in line with ecological equilibrium. It requires an inclusive cooperation and collaboration of all walks of people from changing their current views of nature to a sustainable environmental policy.

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