

Environmental Sociology: An Introduction

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ABSTRACT

Environmental Sociology deals with the interactions between societies and their environments. It focuses on the social dimensions of either the natural environment or the human-built environment with the aim to investigate the human, economic, and political causes of climate change, as well as the effects climate change has on many aspects of social life, like behavior, culture, values, and the economic health of populations experiencing its effects.

The environmental problems caused by social factors which negatively impacts the society need all efforts to solve, and as well as the consideration for environmental ethics, which will border on moral and ethical relationship of human beings to the environment. This paper provides an introduction on environmental sociology, and discusses its impact on humanity and solutions.

KEYWORDS: *Environmental Sociology, Environment, Climate Change, Environmental Ethics, Metabolic Rift, Environmental Degradation, Carrying capacity, Environmental racism, Environmental Refugees, Environmental Justice*

INTRODUCTION

Environmental sociology is the way humans interact with their environments, which closely relates to 'human ecology' focusing on the relationship between people and their built and their natural environment. An important aspect of environmental sociology is the concept of 'carrying capacity' which is the maximum amount of life (or population) that a particular or given area can support or sustain. This also applies to grazing lands, rivers, and to the earth as a whole.

'Global warming' also referred to as 'climate change' is as a result of long-term shifts in temperatures due to human activity and in particular, the release of greenhouse gases into the environment. There is generally, global short-term variations of climate change which include both higher and lower temperatures, despite the overarching trend toward warmth, leading to extreme weather. There are more increasing record breaking weather phenomena, from the number of Category 4 hurricanes to the amount of snowfall in a given winter. These extremes, while they make for dramatic television coverage, cause immeasurable damage to crops, property and even lives [1].

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Each of us is affected by pollution be it air, land, and water one way or the other, hence, we should remember the "tragedy of the commons" [2]. Human activities lead to pollution of soil, water, and air, compromising the health of the entire food chain. While everyone is at risk, poor and disadvantaged neighborhoods and nations bear a greater burden of the planet's pollution, a dynamic known as environmental racism [3].

The main focus of environmental sociology is the relationship between society and the environment in general, placing special emphasis on the social factors that cause environmental problems, the societal impacts of those problems, and efforts to solve the problems. Environment is the study of the public in the largest possible sense of people, other animals, land, water, air all connected, with emphasis on understanding the origins of, and proposed solution. Efforts must also be made to sustain the environment for both the present and future generations.

WHAT IS ENVIRONMENTAL SOCIOLOGY?

Environmental sociology is mainly concerned with the reciprocal relationships between environment and

society. Environmental sociology as a relatively new field emerged due to the increased societal response of the seriousness of environmental problems, amongst which are: poverty and inequality, racial and gender discrimination, crime and delinquency etc.

Environmental issues are material products of ecosystem processes, production and consumption patterns, and human metabolic functions etc. Environmental sociology is about the investigation of the social causes of environmental problems, unpacked political and economic interests at play in environmental conflicts, highlight inequitable exposures to pollution and natural resource decline, and the evaluation of the impacts of environmental policy, and so on. According to Stewart Lockie, environmental sociology is better re-defined as the application of our sociological imaginations to the connections among people, institutions, technologies and ecosystems that make society possible.

Scholars and researchers in sociology have aligned with the New Ecological Paradigm (NEP) which is in line with the ideas of early preservationists and conservationists Aldo Leopold et al., who have called for a healthy balance between human economic activities and the needs of ecosystems, arguing that human social systems must reduce their demands and impacts on the nonhuman nature [4].

HISTORY OF ENVIRONMENTAL SOCIOLOGY

The three major functions of an environment, are the environment's ability to: (1) provide a "living space" or habitat for human population, (2) recycle "waste products" production, which are of greater quantity and variety especially those produced by man, and (3) provide the "sustainable base" i.e. resource base, however, the overuse, or the misuse, and mismanagement of all of the above will result in various forms of "pollution" as are prevalent today worldwide [5].

Environmental sociology emerged as a subfield in the late 1970s in response to the emergence of the environmental movement in the 1960s. But prior to the 1970s, there were scattered sociological attention to natural resource issues, environmental sociology developed in that decade as sociology's own response to the emergence of environmental problems. The nascent environmental sociology of the 1970s was quickly institutionalized via formation of interest groups within the National Sociological Associations – this provided an organizational base for the emergence of environmental sociology. This paved the way for scholars with interest in all aspects of the physical environment i.e. from environmental activism to energy and other natural resources, natural

hazards and disasters, social impact assessment, and housing and the built environment.

Sociological interest in environmental issues started to spread internationally, and by the late 1980s and 1990s environmental sociology was reinvigorated in the United States but was being institutionalized in countries around the world and within the International Sociological Association.

The major accidents at Three Mile Island, in Bophal (India), and Chernobyl dramatized as well as brought to the fore technological hazards and helped generate sociological interest in the environmental and technological risks facing modern societies [6].

Since the early 1990s, Crumley and Balee who as advocates of historical ecology argued that: (1) nearly all landscapes on earth have been affected by humans to differing degrees, (2) both human and natural phenomena that physically manifest in landscapes or immaterially in cultural memory can be studied as an integrative whole, and (3) knowledge of home-land use and change through time can and should be applied to contemporary issues (e.g. global climate change, indigenous sovereignty). This collaborates the fact as opined by Latour that humans and landscapes are inseparable, interrelated wholes, and also that humans play a keystone role in socio-ecological systems [7].

The term 'Metabolic Rift', was coined by John Bellamy Foster [8], which was the development of Marx's earlier work in the Economic and Philosophical Manuscripts on species-being and the relationship between humans and nature.

Metabolism is Marx's "mature analysis of the alienation of nature," and represents "a more solid-and-scientific-way in which to depict the complex, dynamic interchange between human beings and nature, resulting from human labor" [9].

Historical environmental sociologist Mark D. Whitaker in analyzing China, Japan and Europe over 2,500 years in his book Ecological Revolution (2009), argued that environmental movements are very old – being expressed via religious movements in the past (or in the present like in ecotheology) that begin to focus on material concerns of health, local ecology, and economic protest against state policy and its extractions. He argued that both the past and the present are similar, saying: "that we have participated with a tragic common civilizational process of environmental degradation, economic consolidation, and lack of political representation for many millennia which has predictable outcomes." Furthermore, he argued also that a form of bioregionalism, the bioregional state is required to

deal with political corruption in present or in past societies connected to environmental degradation [10].

THE FOCUS OF ENVIRONMENTAL SOCIOLOGY

The main focus of environmental sociology is the relationship between society and the environment in general, placing special emphasis on the social factors that cause environmental problems, the societal impacts of those problems, and efforts to solve the problems i.e. dealing with social aspects of environmental problems and environmental issues [11].

In sociology, the environment is the study of the public in the largest possible sense of people, other animals, land, water, air: all connected, emphasis on understanding the origins of, and proposed solution. In other words, the environment consists of the air, water, and land or the earth, which is affected by man's activities [12], as shown in Figure 1. Environmental sociology is also concerned about sustainability of the natural environment.

SOCIAL FACTORS CAUSING ENVIRONMENTAL PROBLEMS

Environmental factors causing environmental problems are air/land pollution, drinking water contaminants, pesticides, hazardous waste, traffic exposure and others. Social factors include area-level socioeconomic status (SES) and race/ethnicity are also evaluated as potential modifiers of the relationship between pollution and preterm birth. Preterm birth has been associated with air pollution exposure. The NICHD Consecutive Pregnancy Study (2002-2010) contains detailed clinical data on deliveries for more than 50,000 women with at least two pregnancies during the study period – the details of this can be obtained from the study conducted by Laughton S. K. et al. [13].

ASTE MANAGEMENT

Waste management (or waste disposal) involves the activities and actions required to manage waste from its inception to its final disposal i.e. from the point of collection, transport, treatment to disposal of waste, coupled with monitoring and regulation of waste management process. The five types of waste are [14]:

- Liquid waste – this is mostly from households and industries.
- Solid rubbish – these are from households, commercial and industrial locations.
- Organic waste – originates from households.
- Recyclable rubbish.
- Hazardous waste.

BIOFUELS

Biofuels have forced global food prices up by 75% - far more than previously estimated, this was according to a confidential World Bank report obtained by The Guardian. The same paper has previously reported that the British study stated that plant fuels have “played a ‘significant’ part in pushing up food prices” to record levels – which although was not released [15].

The high demand for biofuel is responsible for today's global food crisis. Greenhouse gas emission, which is linked to industrial production, is the cause of global warming as shown in Figure 2, and has consequently led to such environmental disasters as decreases in biodiversity, tsunamis, hurricanes, drought, and acid rain etc. This has subsequently resulted in social displacement, mass migration, and alteration in the size and composition of the population, disease and poverty – which are all sociological in nature [16, 17, 18].

THE SOCIO-ENVIRONMENTAL EFFECTS OF INDUSTRIALISM

From ecological viewpoint, people form an integral part of the environment that actively and often interact with environmental components [19]. Human beings belong to a higher category of organism as well as have more complex brain, and a more sensitive nervous system cum capacity to think and manipulate its environment, enabling man to survive and realize his roles. Human beings depend on the environment for his basic needs like food, shelter, and clothing. The environment therefore forms a fundamental and vital unit for human survival and development. This is why the availability of resources such as petroleum, biodiversity, etc. are important determinants of a society's industrial and economic future, its political power and social circumstances of citizens [20].

Our environment is continuously exploited and overstressed with little or no efforts to preserve or conserve it for future generations and for healthy living, due to our environmentally unfriendly activities. It has also been discovered that newer chemical pollutants which pollute the nation's rivers and underground water generated new health concerns. Synthetic organic compounds were discovered in many drinking water sources [21]. Hence, the law of progress is accompanied by the logic of retrogression i.e. attempts to solve one problem leads the society into another complicated one, which implies that depletion of natural resources and pollution by man/society goes to affect the environment and which consequently comes back to affect the society. Industrialization or industrial

development can result to pollution of land, sea, and air. Others include the emission of CO and CFCs (chlorofluorocarbons) which are used among other things in aerosol and fridges, because when CFCs are released into the ozone layer and exposed to sun's radiation, they decompose and release chlorine compound, which in turn breaks up this layer. The ozone layer helps to screen the earth from the harmful radiation from the sun which can cause cancer, affect food production and leading to global warming. Ozone depletion is associated with global warming and the disruption of photosynthesis [22].

Bush burning, use of firewood and coal which are practiced and common in developing or less industrialized societies, have devastating effects on the environment and human health, as shown in Figure 3. Industrialization in itself is not a total 'scientific curse' as it has been used to achieve successes in the fields of medicine and healthcare, warfare technology, transport, communication, education, personal hygiene and health education. Wastes have been turned to wealth by recycling industries and while some garbage hitherto regarded as useless can now be turned into re-usable products, none recyclable ones can be incinerated or composted in relatively safer ways [23].

Effects of global warming according to scientists could be catastrophic with great consequences to environmental, economic, and health if the current trends continue, leading to the following smattering outcomes [24]:

- Melting glaciers, early snowmelt, and severe droughts that will cause more dramatic water shortages and increase the risk of wildfires in the American West.
- Rising sea levels leading to coastal flooding on the Eastern Seaboard, especially in Florida, and in other areas such as the Gulf of Mexico.
- Forests, farms, and cities will face troublesome new pests, heat waves, heavy downpours, and increased flooding. All of the factors will damage or destroy agriculture and fisheries. Disruption of habitat such as coral reefs and Alpine meadows could drive many plant and animal species to extinction.
- Allergies, asthma, and infectious disease outbreaks will become more common due to increased growth of pollen-producing ragweed, higher levels of air pollution, and the spread of conditions favorable to pathogens and mosquitoes, as shown in Figure 4.

According to the report by the Environmental Refugees Globalization 101, a combination of

worsened drought, oppressive temperatures, and rising sea levels could, by the mid twenty-first century in some scenarios, displace a large enough number of "environmental refugees" to challenge the ability of surrounding nations to accept them. The coined word: "environmental refugees" by Essam El-Hinnawi is used to describe individuals fleeing their homelands or habitats because of drought, desertification, and other environmental factors, placing stress on essential resources. An estimated 25 million people were classified in 1995 as environmental refugees, more than the number of refugees due to civil war or religious persecution – this is a consideration from security perspective [25], and therefore the urgent need and concerted effort by governments to formulate policies to ensure food security among others.

TOP TEN CAUSES OF ENVIRONMENTAL DAMAGE

A great number of environmental degradation is going on all around us which cause damage to our environment, the top ten of such causes are [26]:

- High quantity of exhaust gases – this is known to be the biggest reason by far for all kinds of environmental damage which is the exorbitant amount of gases, harmful to the environment which are released by various industries. Prime among these gases are CO, SO₂ and NH₃ which are main culprits for ozone hole and global warming among many others.
- Deforestation – this is the cutting down/harnessing of forest resources, to clear land, for wood and for other various reasons, and this ranks second to exhaust gases. The singular major problem it causes is that it decreases the number of trees, which clean the environment, provide oxygen, and also affect rain patterns. Hence, the clarion calls for tree planting campaigns so as to replace those cut or lost.
- High number of industries such as mining – mining cause major pollution due to releases of particulate matter which qualifies as Respirable Particulate Matter (RPM). The particulate matter which can enter the lungs and can harm the entire respiratory system. This form causes the worst direct harm to humans, also particulate matter can come from indoor pollution, as can be seen in cooking on traditional 'choolahs' and cottage industries like 'bangle-making'.
- Chemical effluents - these are by-products of industries which poses as threat to the environment, leather and tanning industries, petroleum industries and chemical manufacturing

industries create major waste products which are released directly into nearby streams without treatment, creating water pollution and causing harm to aquatic life.

- Transport – the increased number of cars and vehicles on the road due to increase in population and spending power of people, has directly led to more pollution. Vehicular pollution is the cause of smog, and as well as hydro-carbons released from engines, creating lower layer ozone harmful or injurious to humans.
- Unprecedented Construction – Urban Heat Island is a direct cause of unprecedented construction activities that are being carried out right now, which causes trapping of pollutants. Urban Heat island is an effect caused due to trapping of solar radiation by concrete and cement which are materials which trap heat extremely well. Construction causes removal of vegetation cover which usually allows for better exchange of heat. This heat island effect causes constricted circulation of air, which traps pollutants released in urban areas and does not allow for mixing of the air, thus decreasing the air quality.
- Secondary Pollutants – These are not directly emitted, but are created when primary pollutants react amongst themselves. Major amongst them is the creation of ozone from reaction between non-burnt hydrocarbons and nitrous oxides. There are various other secondary pollutants and the reaction between these pollutants cause reactions that lead to formation of ozone holes. Stratospheric clouds are the main reaction sites for such pollutants.
- Ruinous Agricultural Policies – Overloading the land with fertilizers, overgrazing and shifting agriculture are ruinous agricultural policies that degrade land, creating soil erosion that leads to slitting in major rivers and reservoirs. Soil degradation is a continuous cycle and it ultimately leads to desertification and degradation of land quality by allowing the direct action of eroding agents on cultivable land.
- Population Explosion – Increase in population usually creates a load that the environment has to support, not only in terms of food and lodging or shelter, but also in terms of the volume/quantity of waste it generates and the ability of the environment to support the growth.
- Unplanned Land-use Policies – Land models are available these days which help in proper planning and use of land resources. However, failure to use these models and land management

policies can lead to land pollution and degradation of the worst kind. Extraction from mines renders them unusable for habitation and if rehabilitation work is not carried out, the piece of land is sure to lose all its values and becomes unusable. Land classification is one of the major activities that help in proper land use, and it should be followed with utmost care.

THE ROLE OF POVERTY AND THE ECONOMY IN ENVIRONMENTAL DEGRADATION

The politics of the global imperial era are having a consequential impact on the environment, mainly in third world countries.

The powerful administration of the imperial powers transparently sought to enrich their home countries with resources, which came from the exploitation of land, mines, forests etc. of the colonies, without thinking of the environmental consequences and long term impacts/effects on the colonies.

The enhanced profitable extraction of resources was one of the main objectives of the colonizing powers, from the first Spanish colonies to the last British and Portuguese colonies. The Industrial Revolution actually fueled the need for colonial resource extraction.

Industrialization and imperialism went hand in hand, in which industrialization worked as a powerful tool for imperialism. As the dance between industrialization and imperialism grew faster, less care was paid towards environmental concerns. This continued till the mid-20th century.

Parati defined imperialism as a process whereby the dominant politico-economic interest of one nation expropriates the land, forest, raw materials and resources of the powerless nations. This was what happened during this period. It was during the mercantile era and mainly after the peace of Westphalia when countries started adopting this idea of occupying territories to get raw materials and resources for the production of goods, which would lead to more accumulation of capital and consequently the advancement of the nations to fuel their economy. Colonizers occupied the territories and started mining their resources and minerals for the benefit of the colonizer nations. The common suffering among all postcolonial nations is poverty and instability. Despite the paternalistic justification given by colonial powers, they developed their nations because of the surplus extracted from the resourceful countries of Africa, Asia, Latin, and South America which has adversely affected the standard of living of these countries even to this day.

The people of the third world countries have experienced (and are even still experiencing) some of the most intense poverty and political instability. According to World Bank statistics, over 900m people are making less than \$1.90 a day, the majority of which are concentrated in sub-Saharan Africa.

Poverty also is known to play a critical and important role in armed conflicts, since those suffering from poverty easily join armed conflicts, which is a source of environmental degradation. All these world wars and nuclear wars have negatively impacted the environment, with the Second World War causing more significant impact due to the explosion of nuclear bomb. The state of the world today, which is the suffering from limited resources, is the consequent effect of the exploitative measures of powerful kings and empires. As Harm de Blij stated, "The emergence and diffusion of modern humanity is a drama whose scenes are still being reconstructed and whose backdrops are still being painted" [27].

PREVENTION OF ENVIRONMENTAL POLLUTION

Pollution Prevention (P2) is a strategy for reducing the amount of waste created and released into the environment, particularly by industrial facilities, agriculture, or consumers. P2 is also viewed as any practice that reduces, eliminates, or prevents pollution. Reducing the amount of pollution produced means less waste to control, treat or dispose of. Less pollution means less hazards posed to public health and the environment. Many large corporations view P2 as a method of improving the efficiency and profitability of production processes by waste reduction and technology advancements.

In the United States of America, legislative bodies have enacted P2 measures, such as the Pollution Prevention Act of 1990 and the Clean Air Act Amendments of 1990.

The following approaches can be adopted [28]:

- Voluntary approaches – Governmental organization often collaborate with businesses and regulatory agencies to create a structure of guidelines. There are four types of voluntary approach programs: public voluntary programs, negotiated agreements, unilateral commitments, and private agreements.
- Governmental approaches – Environmental Protection Agency (EPA) has published waste minimization guidelines that comprise of 5 major steps, as shown in Figure 5.
- Waste reduction algorithm – The EPA makes available software that employs the Waste Reduction Algorithm. They use the acronym

WAR for this method and stated that 'the goal of WAR is to reduce environmental and related human health impacts at the design stage'. The WAR tracks pollutants through the entire production process in order to obtain accurate measurements.

- Industrial efforts – Some companies choose to redesign their entire industrial process in order to maximize P2 opportunities. Managers focus more on what enters and moves through the entire process, instead of only focusing on the output. The P2 strategies that financially benefit companies are the most likely to be implemented.

The excessive exploitation and overuse of environmental resources, overcrowding due to overpopulation and the massive generation of waste products are the principal causes among others of environmental pollution. The various forms of pollutants which enter into bodies of water, air, and or land find their way into the food chain which impact negatively on the wellbeing of humans and living organisms. Some of the preventive measures that can be taken to mitigate or reduce the negative effects are as follows:

- International and national concern to tackle the menace of pollution by the enacting or formulation of policies/laws to reduce or eliminate the pollution of our environment by exhaust gases like CO, SO₂ and NH₃ causing ozone hole and global warming among many others. To this effect, the governments of various countries must have the political will to rise up for the protection of the environment.
- Deforestation i.e. the cutting down of trees must be stopped or discouraged. Also tree planting campaigns are to be carried out to replace those already lost.
- Industries must be checkmated through government regulations to reduce harmful Respiratory Particulate Matter (RPM), and other chemicals to safeguard human health and aquatic life. The release of heated water into rivers raises the water temperature leading to the death of aquatic or marine life such as fishes, plants etc.
- The need to ensure good agricultural practices where overgrazing, shifting cultivation should be discouraged and or minimized, while the use of fertilizers too should be minimal.
- Human population need be checked, since any particular environment has its own "carrying capacity," beyond which it will negatively impact the environment. This can be in terms of great

amount of wastes generated, shelter and food shortages and so on.

- Proper land-use policies should be put in place to enhance proper land planning management and use of land resources, otherwise land pollution and degradation of the worst kind can occur.
- Alternative source of biofuels – other sources of energy should as a matter of urgency be sourced which could be sun or solar energy, wind etc. This is due to the fact that the high demand for biofuel is responsible for today's food crisis. Furthermore, greenhouse gas, especially CO₂ or methane, that trap heat above the earth and cause greenhouse effect (which is the gradual warming of the air surrounding the earth as a result of heat being trapped by pollution), and leading to global warming, decrease in biodiversity, drought, acid rain, hurricanes etc. The resultant effect can lead to social displacement, mass immigration (environmental refugees), disease and poverty.
- Preservation and conservation of the environment to avoid it's over exploitation.
- Total ban of chlorofluorocarbons (CFCs) and aerosols.
- Biotechnology advancement in the use of living things such as cells, bacteria etc. to make drugs, destroy waste matter and so on by biotech industries.
- Sustainability of the environment.
- Proper waste management of both biodegradable and non-biodegradable wastes which involves the management of wastes from the point of collection to final disposal, as well as the monitoring and regulation of waste management process.

To enhance greener environment and clean air free from pollution, the steps to follow are as mentioned below:

- Reduce the number of trips you take in your car i. e. by making use of public transport, thereby leading to reduction of CO emission.
- Reduce or eliminate fireplace, wood stove use and smoking.
- Avoid burning of leaves, trash, and other materials.
- Avoid using gas-powered lawn and garden equipment.
- Bring reusable bags in which to carry purchased goods in order to reduce the number of disposed paper/plastic bags.

- Use water sparingly or economically by installing water-efficient shower heads and faucets.
- Install energy-efficient appliances such as light/fluorescent bulbs that consume less energy. Also turn off the lights when not in use.
- Ensure that sinks and hoses are not dripping.
- Do not excessively water plants.
- Make use of fans more often than air conditioner.
- Make use of filters for chimneys.
- Avoid usage of crackers especially during carnivals, anniversaries etc.
- Implement afforestation.

Furthermore, other strategies include:

- Awareness – this is required to render and distribute information on the consequences of environmental pollution e. g. climate change on human health, and opportunities to improve health while decreasing carbon emissions. The education systems of all countries are to include Green Tech Careers, from primary to the tertiary level of education [29].
- To develop and create high-impact campaigns, environmental movements and projects through World Health Organization, UNICEF and so on.
- Use of the Principle of Environmental Justice – this looks at the health disparities that are due to the cumulative impacts of pollution exposures and social stressors especially on low-income residents/communities, communities of color, as shown in Figure 6, and indigenous communities who often lack amenities, resources, and conditions that support healthy living [30].
- Use of the media for information dissemination on awareness on effects of environmental pollution.
- Youth involvement – they can make their homes, schools, and youth organizations more environmentally friendly by adopting more environmentally friendly practices such as preserving resources like water and electricity.

CHALLENGES OF ENVIRONMENTAL POLLUTION CONTROL

In spite of the tremendous progress made in science and technology, humanity and the environment is still faced with the problem of pollution.

This is due to less research being conducted in important areas in the gas and oil industries like – assessing the impact of waste returned to shore for disposal; identification of sustainable strategies for

operations; and assessing and mitigating against adverse effects/impacts from atmospheric emissions.

Concerted efforts should be made and goals set in order to control air pollution in every country in accordance to the Global updated WHO Air Quality Guidelines for Particulate Matter (PM), SO₂, NO₂ and O₃ [31].

In most developing countries, Nigeria in the Delta area as a case study, there is the lack of emissions inventory/database due to lack of consistent and systematic measurements [32], in addition to:

- Unavailability of air pollution and GHG monitoring stations in the Niger Delta area in Nigeria. This is based on the information from World Data Centre for Greenhouse Gases.
- Few independent and research-based measurement data are not readily available for general public use.
- Lack of collaboration between key regulatory authorities.
- Laxity in the enforcement of emission regulations.
- Air quality assessment and air pollution studies have focused mainly on urban centres.
- Government not involved in systematic and consistent air quality assessment programs as is being done in other parts of the world such as that carried out by Environmental Protection Agency (EPA) in the United States.
- Problem of insecurity and difficulty in terrain that militates against most community based air sampling initiated and then the lack of requisite and adequate technical manpower to carry out the multifaceted and complex air quality studies in the region, and poor policy framework.

CONCLUSION

Environmental pollution, without gainsaying, poses as a great threat to human health and the environment in general, as this led to the death of 9 million people in 2015 [33]. Unfortunately, humans are the major source of pollutants to the environment as a result of over exploitation of the natural resources of the environment, without consideration for management. Human society is now paying dearly for this as is evident in most developing or third world countries faced with severe drought leading to food crisis, poverty, sicknesses and diseases, immigration/environmental refugee problem, acid rain etc.

Nations of the world, developed and developing countries, need to urgently rise to the challenges and

the adverse effects our environment is exposed to by humans. Governments at various levels must urgently formulate workable policies in conjunction with regulatory authorities/agencies to ensure enforcement by industries, organizations and individuals, since everybody is exposed to the hazards from pollutants. Non-compliance to regulatory policies and laws must be sanctioned as a deterrence.

Mass education and environmental pollution awareness should be enshrined in our educational curricular, so that our children and youth would be more conscious of how they too can contribute to greener and clean environment.

The involvement of all stakeholders to employ a holistic and integrated approach to all forms of pollution to the overall benefit of humanity and the environment for the present and the future generation, with use of modern equipment, skilled personnel and good policy framework should be put in place.

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Figure 1. Air pollution due to smog.

Source: <https://api.time.com/5736859/lahore-pakistan-pollution-amnesty-urgent-action/>



Figure 2. Air pollution due to heat.

Source: https://en.wikipedia.org/wiki/Emissions_trading



Figure 3. Bush burning.

Source: https://en.wikipedia.org/wiki/Burning_bush

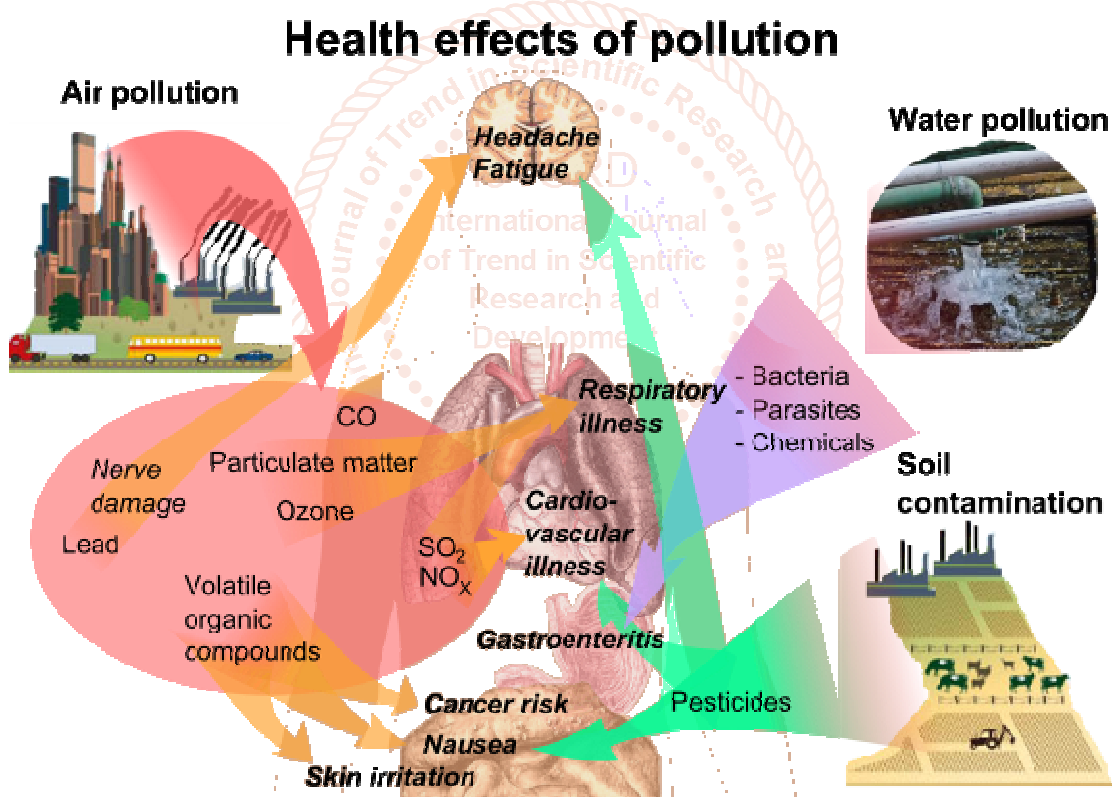


Figure 4. Impacts of environmental pollution on humans.

Source: https://en.m.wikipedia.org/wiki/File:Health_effects_of_pollution.png



Figure 5. Federal Agency for Protection of the Environment.

Source: https://en.wikipedia.org/wiki/United_States_Environmental_Protection_Agency



Figure. 6. Environmental justice.

Source: https://en.wikipedia.org/wiki/Climate_justice

