

Impact of Human Civilization on The Environment

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Abstract – Human civilization through successive centuries has had a heavy toll on the environment. Each intervening century has contributed to environmental damage in one significant way or the other. Evidence suggests that as human capacity increases, there is a corresponding increase in productive skills which impact the environment. The remote and immediate causes of human activities have given rise to what is today known as environmental degradation. The escalation of environmental degradation has become a world concern-giving way to collaborative efforts in human and material resources at the local, regional and international frontiers of cooperation as a remedy for environmental crises. This is the theme discussed in this paper.

Keywords – Human civilization; Human activities; Environmental degradation.

I. INTRODUCTION

Through the centuries, human civilization has given rise to human activities, and human activities have led to environmental degradation which has international repercussions. The resultant environmental damage of human activities has a negative impact on the economic growth and livelihoods of people. These human activities have reached crisis proportion sometimes described as irreversible.

Humans and their activities impact the physical environment through overpopulation, pollution, burning fossil fuels, deforestation, and depletion of resources such as air, water and soil, the destruction of ecosystems, habitat destruction, and the extinction of wildlife. Consequently, to meet the basic needs of the increasing population, human society has undertaken a series of activities such as rapid industrialization, unplanned urbanization, deforestation, overexploitation of natural resources etc.

Human has a symbiotic relationship with the environment as a source of food, water, fuel, medicines, building materials etc. advances in science and technology has facilitated the exploitation of the environment by humans, and have in the process introduced pollution and environmental damage. In an assessment of the rate of environmental damage across the planet, UNEP (2016) reports that environmental change sweeping the world is occurring at a faster pace than previously though making it imperative that governments act now to reverse the damage being done to the planet. It is in this vein that the Executive Director of UNEP, Achim Steiner, expresses the current state of the World's environment in the following way:

If current trends continue and the world fails to enact solutions that improve current patterns of production and consumption, if we fail to use natural resources sustainably, then the state of the world's environment will continue to decline. It is essential that we understand the pace of

environmental change that is upon us and that we start to work with nature instead of against it to tackle the array of environmental threats that face us.

The report further states that across the world, climate change, the loss of biodiversity, land degradation and water scarcity are growing problems that need to be urgently addressed if the world is to achieve the goals set out in the 2030 Agenda for Sustainable Development.

Similarly, the Guardian (2016) citing the UN study as the most comprehensive environmental study ever undertaken by the UN, reveals that degradation of the world's natural resources by humans is rapidly outpacing the planet's ability to absorb the damage, indicating that the rate of deterioration is increasing globally.

According to the Guardian (2016), the study by the UN Environmental Programme (UNEP), involved 1,203 scientists, hundreds of scientific institutions and more than 160 governments, which remarks that without radical action the level of prosperity that millions of people in the developed world count on will be impossible to maintain or extend to the poorer countries. Part of the major findings of the study was water scarcity as the scourge of some of the poorer regions on Earth, leaving developing countries increasingly unable to feed themselves, and causing hardship for millions of people. There appears to be little prospect of remedying this serious situation without radical and concerted action being taken. According to this source, water sources are under increasing threat from population growth, climate change, rapid urbanization, rising levels of consumption, and the degradation of lands that previously provided a natural replenishment of water resources.

The study is intended as an aid to the world's efforts to combat climate change and other environmental threats, as it highlights the difficulties of improving the lives of people in developing countries and tackling global warming, while food resources come under continuing pressure. UNEP findings also indicate that the rate of damage to the natural environment was increasing globally, despite concerted efforts to persuade governments to take measures to improve the condition of vital natural resources, such as water, land and the seas.

While the UNEP executive director admits that the tools for improving the environment for millions of people exist in the developed countries, they were in danger of not being used. The study indicates that using decades of scientific data, basic measures to tackle some of the key causes of environmental damage are still not being taken. These measures include reducing air pollution, such as changes to vehicles; the damage to marine ecosystems, which can have a significant effect on fish stocks on which hundreds of millions of people depend; and the degradation of land when modern agricultural methods were pursued without regard to the long-term consequences.

In the analysis of the report despite global agreement on cutting greenhouse gas emissions, global carbon output is still on the increase. It maintains that this will put a long-term strain on the ability of developing economies to feed their own people as a result of changes such as increased droughts and floods. Other environmental problems identified in the report include climate change, exacerbated by the emissions of greenhouse gases from agriculture and the leaching of nitrous oxide – a greenhouse gas from run-off emissions and incorrectly stored animal manure. Another is glaciers in the Andes, which provide water resources for tens of millions of people, but which are shrinking as the climate warms.

It is maintained that these problems have built up in rich countries over decades and centuries while economic growth was pursued at the expense of the environment. Subsequent efforts to remedy the environment have met with little success. However, in developing countries, the path of future development has more potential to change, which has encouraged international institutions to devise more sustainable growth pathways that are supposed to alleviate poverty and preserve the environment. But if they follow the same pattern of growth in developed countries, it would intensify the danger of irreparable environmental damage.

It is therefore recommended that an increased awareness should be created on the environmental impact of development. This could be, for example, by making water resources more sustainable by recycling water where possible, and changing agriculture so that wasteful method of irrigation is replaced by more efficient ones. Developing countries also have to change their methods of dealing with waste to protect clean water sources and prevent the burning of solid waste in landfill dumps.

What all this analysis highlighted above means is that while the civilizing process is a growing phenomenon – and cannot be halted – development pathways can be determined, defined and pursued in ways that do not impinge on the environment, but

conform to sustainable development goals (SDGs). It also means that all development patterns (government or non-government) must follow the blueprint for peace and prosperity for people and the planet contained in the 2030 Agenda for sustainable development, adopted by all United Nations Member States in 2015. This will guarantee a global environment that can support and sustain the human and non-human species that depend on it for survival.

Human Impact on the Environment

The most significant human impact on the environment has been attributed to industrial developments, which began about the mid-nineteenth century with resource depletion and environmental problems. Industrial activities created pollution problems of local, regional and interregional magnitudes. Some legislative efforts were also initiated.

The extent and intensity of human exploitation of the Earth's resources during the twentieth century resulted in significant effects on major components of the biosphere such as the atmosphere, land cover, and biodiversity. Rao (2000) explains that this was largely due to rapid industrialization, deforestation, and urbanization. The tempo of resource exploitation and economic growth heightened, especially after World War II. The post-war rehabilitation efforts necessitated the need to rebuild societies and economic systems. In doing so, however, some indiscriminate and desperate methods of tampering with the ecosystem led to current concerns about the potential dangers to the survival of the human race and that of other species.

The contribution of Carson (1962) in his work, *Silent Spring*, is generally credited with laying the foundation for the modern era of environmental awareness and social concern in developed countries. Her work highlighted mainly the significant risks posed by some categories of pesticides, especially dichlorodiphenyltrichloroethane (DDT), and brought to light the need for environmental alertness to safeguard human health. She examined every form of life on this planet and sought accommodation between humans and nature. Another writer Hardin (1968) warns about the imminent dangers of excessive resource exploitation and environmental mismanagement. Garrett Hardin writes: "Ruin is in the destination toward which all men rush, pursuing their own best interest in a society that believes in the freedom of the commons, freedom in the commons brings ruin to all". This comment is instructive in the management of resources with free access.

Writing on *The Role of Human Activities in past Environmental Change*, Oldfield and Dearing (2003) document the task of modern environmental science in understanding how human impacts on the earth system interact with other processes of global change. Such understanding, they point out, is important to establish the consequences of further population growth and increased economic activity. And their higher demands on energy, water and a wide range of resources, both renewable and nonrenewable.

Oldfield and Dearing assert that contrary to general opinion, it is now established that the time-span of human impact on the environment, at the regional level, ranges over millennia and not merely the last two centuries of industrialization. It is these past human activities, their impacts and interactions with climate variability and the human consequences of these interactions that form part of the essential context within which to evaluate present-day impacts and likely future consequences, the aggregate of past human impact on the environment: greenhouse gases, trace metals, and other industrial contaminants and radioisotopes, paleo-perspectives on acidification, eutrophication and the ecological status of lakes, coastal waters and peatlands, land use and land – cover changes, paleo-perspective on human activity and biodiversity, impacts on erosion, sediment yields and fluvial systems all constitute perspectives on the paleo record of our understanding of past interactions of environmental processes and human activities.

The American National Academy of Sciences, NA (2020) research on human activities has shown that deforestation and energy consumption are determined by population growth, economic and technological development, cultural forest, values and beliefs, institutions and policies, and their collective interactions. The research indicates that human transformations of the global environment have a long history. Data provided have shown that since 1700, human activity has converted 19 per cent of the world's forests and woodlands to cropland and pasture. This shift has altered biogeochemical cycles, land surface characteristics, and ecosystems so much that the Earth system itself has changed significantly.

Human activity, through fossil fuel consumption since the Industrial Revolution, has also contributed to substantial increases in atmospheric concentrations of such gases like carbon dioxide and methane. These increases are mostly associated with per capita consumption of fossil fuels and growth of the human population; deforestation and the production of cement, livestock, and rice for human consumption; the disposal of wastes from the human settlement in landfills; and increased use of fertilizers and industrial

and agricultural chemicals. The effects of these gas emissions include the warming of the global climate and a reduction in stratospheric ozone.

The world's population has increased between 1950 and 2000 from 2.5 billion to more than 6 billion people. Total energy consumption increased from 188,000 petajoules annually in 1970 to almost 300,000 petajoules in 1990, and per capita consumption increased from about 50 to 57 gigajoules. Between 1970 to 1990, global forest area decreased by 6 per cent, the irrigated area increased by almost 40 per cent, the number of cattle increased by 25 per cent, and the use of chemical fertilizers doubled.

It is estimated that major climatic changes lie in the future, and so are their implications for humanity. This will also apply to the human consequences of ecological transformation occurring now through deforestation and other anthropogenic land cover changes. These alarming trends of the global environment should be the concern of all global environmental citizens. To mitigate environmental problems would require changing attitudes and values, behaviour modification, and economic transformations.

Ways Human Activities Negatively Impact the Environment

Human activity has had a significant negative impact on the environment during the past centuries. Kent State University (2020) reports that humans since Homo Sapiens first walked the earth, have been modifying the environment through agriculture, travel, urbanization and commercial networks. In both negative and positive ways, human civilization and technology have affected the environment, altering it forever.

Several environmentally damaging human activities have been identified by some writers, researchers and investigators (Kent State University, 2020; Wilson, 2018; Alexander, 2020; and Conserve Energy Future, 2020). They include among others:

1. Deforestation

The forests are the earth's lungs. With an exponential expansion in human beings, more food, materials, and shelter are being manufactured at alarming rates, with the products derived from forestry. Forests are cleared to make room for new humans, which in turn makes more humans. An estimated 18 million acres of trees are cleared each year to make way for new development and wood products – that is just under half of all the trees on the planet since the industrial revolution began. With trees being one of the largest products of oxygen, it is important to humans and to animals for which forest is home. With millions of different species that live in forests, deforestation is a major threat to their survival and an environmental issue. It also increases greenhouse gases within the atmosphere which leads to further global warming. Such human activities need to stop if humans are to survive.

2. Acid Rain

When humans burn coal, sulfur dioxide and nitrogen oxides are released into the atmosphere where they rise and accumulate in the clouds until the clouds become saturated and form acid rain, causing havoc on the ground beneath. When the rain falls, it accumulates water bodies which are especially harmful to lakes and small bodies of water. The ground surrounding the water soaks up the acid, depleting the soil of essential nutrients. Trees that absorb the acid accumulate toxins that damage leaves and slowly kill large areas of forest. Acid rain is also known to eliminate entire species of fish, causing a snowball effect of damage to the ecosystem that relies on diverse organisms to sustain the environment.

3. Pollution

Human activities affect the environment by contributing to air pollution, or the emission of harmful substances into the air. Pollution can affect soil or waterways and can come from human waste, industrial chemicals and other sources. These toxins can exert tremendous effects on the natural world, leading to environmental degradation and problems such as acid rain and harmful algal blooms in the ocean.

4. Global Warming and Climate Change

One of the ways humans have affected the environment is through the extraction and consumption of fossil fuels and their attendant CO₂ emissions. Scientific studies indicate that CO₂ emissions contribute to the deterioration of the earth's ozone layer, which may, in turn, contribute to global climate change. This occurs when emissions are combined with the loss of the carbon sink effect of forest lands (due to deforestation) and existing particulate matter in the air. Human activity has some degree of impact on the climate.

5. Overpopulation

There is no doubt that the world's population is continuing to rise. The earth's population is estimated at 7.6 billion, and it is argued that population increase is reaching the point where the planet can no longer support the number of people living on it. According to the United Nations' predicted population growth figures, the global population could rise to 8.5 billion by 2030, to 9.7 billion by 2050 and 11.2 billion by 2100. Unless there is a reduction in the impact humans have on the environment, population explosion will continue to have a negative impact on planet earth.

6. War Impact

It is not only people and their homes that become victims of war. Weapons used in military conflict can cause oil and gas pipes to explode, set forests on fire, pollute water, air and soil and destroy the habitats of millions of wild birds, aquatic life, insects and animals.

7. Ozone Depletion

The ozone layer is known for its ability to absorb harmful UV rays that would otherwise be detrimental to the health of all life. Ozone is made up of three bonded oxygen that floats up to the stratosphere where they absorb a substantial amount of UV radiation, protecting all life on the planet. However, ozone-depleting substances (ODS) primarily made up of chlorine and bromine find their way up to the stratosphere where they strip the O₃ of oxygen, destroying its capabilities of absorbing UV light. Ozone depletion has a devastating impact on both humans and plants.

8. Urbanization

Improved services, facilities, jobs and housing increasingly draw people to urban areas. Consequently, villages quickly become towns and towns transform into cities thereby making inroads into the countryside. Rural areas and the habitats of thousands of wildlife are destroyed as a result. About 50% of the world's population live in cities and this figure is expected to grow. The concentration of a large number of people in a given area puts a strain on energy, food and housing supplies, and increases the pollution levels in the surrounding water, air and land. One of the ways to combat this trend is to encourage people to live in rural areas while providing corresponding improved facilities and services for them.

9. Technology

The environmental impact of technology is perceived as inevitable. The main purpose of technologies is to exploit, control, or otherwise improve upon nature for the perceived benefits of humanity. However, the application of technology will undoubtedly lead to the disturbance of natural processes which result in negative environmental consequences. This is the negative environmental impact of technologies through material utilization can create a disorder in the environment.

10. Agriculture

The environmental impact of agriculture will very well depend on the production practices adopted by farmers. The environmental impact of agriculture involves a variety of factors from the soil, water, air, animal and soil diversity, plants, and the food itself. Some of the environmental issues that are related to agriculture are climate change, deforestation, genetic engineering, irrigation problems, pollutants, soil degradation, and waste.

11. Irrigation

The environmental impact of irrigation will include changes in quantity and quality of soil and water as a result of irrigation and the resulting effects on natural and social conditions at the upstream and downstream of the irrigation scheme. The impact results from the changed hydrological conditions owing to the installation and operation of the scheme.

12. Land Loss and Soil Erosion

The Global Assessment of Human-induced Soil degradation, under the UN Environment Programme, estimated that 6 million hectares of land per year had been lost to soil degradation since the mid-1940s. Such losses are attributable not only to soil erosion, but also salinization, loss of nutrients and organic matter, acidification, waterlogging, compaction and subsidence. Human-induced land degradation tends to be particularly serious in dry regions.

13. Transport

The environmental impact of transport is significant because it is a major user of energy, and burns most of the world's petroleum. This creates air pollution, including nitrous oxides and particulates, and it is a significant contributor to global warming through the emission of carbon dioxide, for which transport is the fastest-growing emission sector. By subsector, road transport is the largest contributor to global warming. Other environmental impacts of transport systems include traffic congestion and automobile-oriented urban sprawl, which can consume natural habitat and agricultural lands. By reducing transportation emissions globally, it is predicted that there will be significant positive effects on Earth's air quality, acid rain, among the climate change.

14. Black Carbon

Black carbon particles have been generated by human activities for as long as human civilization has lasted. Black carbon particles are materials emitted into the atmosphere as smoke and are produced from cooking with solid animal fuels, burning firewood, diesel car exhausts, oil and gas production, and the burning of trees. The presence of these particles in the atmosphere creates a heat-absorbing layer that gives rise to increased global temperatures, thus compounding the global warming effect. Nations heavily dependent on diesel fuel, coal, and burning of wood or coal during fuel for heating and cooking are the biggest emitters of black carbon. Black carbon has also changed weather patterns and reduced rainfall in West Africa and South Asia, according to various scientific reports. It has also played a role in the melting of the glaciers in the Himalayan region, threatening ecosystems and water supplies for millions of people.

15. Plastic Production

The invention of plastic has created one of the most problematic pollution problems ever witnessed on the face of the earth. Waste plastic is everywhere on earth, even in the oceans. Plastics remain in the environment for thousands of years and have long-lasting consequences on fragile ecosystems and regulatory cycles. Presently, the world produces nearly 300 million tons of plastic yearly, and 20% - 40% of this winds up in the landfills with 10 – 20 million tons finding a way into the world's oceans, interrupting aquatic life. Plastics floating in the oceans are estimated to amount to 5.2 trillion weighing a total of 268, 940 tons, based on a research study by the World Research Institute. The chemicals present in the plastics are released in the waters, interfering with animals' endocrine systems and changing their reproduction patterns. They can also cause rapid cell division, which may result in cancers. Worst still, since plastics remain in the oceans for many years, they can ultimately reverse ecosystems with damage costs approximated at 13 billion US dollars annually. Wildlife is most affected, as some have even died after consuming unusually large amounts of plastics. About 4,000 cases of fish with plastics in their bodies have been recorded worldwide.

16. Destruction of Reefs

Ocean reefs are the world's richest oceanic ecosystems, but human activities have led to their destruction by upsetting the natural flow of nutrients and energy that support plant and animal species in the marine world. Water pollution, climate change, overfishing and acidification of marine waters are the repercussions of human activities that have caused the destruction of coral reefs. Experts say that one-fifth of global reefs are already destroyed and one-fourth of reef species might go extinct by 2050. Also, the livelihoods of about 500 million people globally depend on the coral reefs for survival because these are the critical growth and reproductive areas for many fish species. The reefs simply provide shelter and productive grounds for aquatic species, and upon their degradation or destruction, they stop providing the essential materials for a vibrant interconnectedness that is necessary for supporting specific aquatic ecosystems.

17. Overhunting and Overexploitation

Overhunting and overexploitation of natural resources through activities such as overfishing and mining have caused a reduction in the number of varied plant and animal species, that is to say, that the diverse existence of animal and plant species in different habitats has been widely affected by overhunting and overexploitation. These human activities do not give room for the replenishment, growth, or new development of already exploited or harvested products. Overhunting can cause extinction, destroy natural reserves and breeding areas, and affects food chains. It is, therefore, expected that whenever any living thing or native species that play a part in an ecosystem is taken away in large quantities or becomes extinct, the entire ecosystem suffers and can be permanently altered. Similarly, when humans convert forests into farmlands or river basins into mining areas, the areas are made harsh for the survival of animal and plant species.

18. Oil Spillage

Oil spillages are known to have affected a large expanse of lands and marines. Oil spills can occur from blowouts, pipeline leaks or accidents at sea. When an oil spillage happens in the ocean tens of thousands of marine animals and plants are often killed or poisoned. The clean-up operation of oil spill can cause tremendous harm, and it can take a decade or more for an affected area to recover from an oil spill.

19. Radiation

When radioactive leaks do occur, they cause terrible damage to the environment and the health of all living creatures exposed to the radiation from the leak. When a radioactive leak happens people and animals in the immediate environment have an increased risk of cancer. Plants exposed to radiation can also become radioactive and once animals eat these plants this radioactivity enters the food chain. The radioactive waste produced by nuclear power stations can remain active for hundreds of thousands of years, as yet no solution has been found for disposing of nuclear waste safely and the risk of it contaminating the environment remains a big concern.

20. Over-use of Antibiotics

The over-use of antibiotics has created anti-microbial resistance or bacteria that are harder to kill off and, as anti-biotic kill off good, as well as bad bacterial, humans and animals, are left more vulnerable to illness. This can become one of the world's most serious public health problems. As human and animal waste is discharged into the environment, traces of antibiotic drugs have been found to infiltrate the soil. They get absorbed by plants and inadvertently enter the food chain, which further exacerbates anti-microbial resistance. Attempts are underway to limit the prescription of anti-biotic to animals and humans, but its enforcement will be difficult.

These and many other human activities that impact the environment will remain major concerns and focal points in local and international environmental agenda. However, what is more, pertinent is for governments and stakeholder institutions to ensure the promotion of policies and actions that sustain the evolution of the Earth's natural processes.

Institutional Interventions on the Environment

At the global level, the Swedish initiative supported by the USA led to the first global environmental conference: The UN Conference on the Human Environment, held in Stockholm in 1972. UNEP (1992) and Rao (2000) document the UN Conference on the Human Environment at Stockholm in 1972 as commonly thought of as the event where an international debate on the environment began, and as well the culmination of a considerable process of discussion. The conference led to the Stockholm Declaration with 29 Principles and provided a permanent basis for international environmental coordination and diplomacy.

It is, however, to be noted that the developed and developing countries attended the conference on different platforms of discussion. According to UNEP (1992):

The industrialized world came to discuss international solutions to pollution problems that resulted from the growth of industrial activity. Their emphasis was on regulation and pollution control. They were also concerned with nature conservation, especially with threats to particular species (such as whales) and habitats (such as rain forests). The developing countries expressed little interest in these problems as compared with the pollution of poverty and the inefficiency of resource use caused by underdevelopment.

The Stockholm Conference was the culmination of a two-year preparatory process and the beginning of a new and intensified programme. In the preparatory process, Intergovernmental Working Groups drew up plans for a global environmental monitoring system (IGEMS) an International Register of Potentially Toxic Chemicals (IRPTC) and an International Referral System for Sources of Environmental Information (INFOIERRA).

Several developments followed the publication of the Brundtland report. It stimulated several conventions to protect the environment adopted by the UN General Assembly. It is remarkable, however, that after the Stockholm Conference decided on a system of environmental co-ordination for the UN, it took fifteen years for many governments to adopt for themselves (UNEP, 1992).

The Stockholm conference created a great deal of public interest in the environment and provided directives for international and national action. It began a process that linked the environment inseparably with economic development. Also, there was increasing understanding and recognition that neither individual nations nor the North and the South acting alone could adequately protect the global environment. The institutional and financial arrangements set out in the Stockholm Conference report provided the basis for the establishment of the UNEP Programme as a by-product by the UN General Assembly.

Chronology of International Events

The following event-form major developments, facilitated by international institutional actions in the global context. This listing depicts the evolution of action plans, programmes and strategies since 1972.

Major Action Plans, Programmes and Strategies since 1972

- 1972: Stockholm Action Plan.
- 1974: World Population Plan of Action.
- 1974: Universal Declaration on the Eradication of Hunger and malnutrition (FAO)
- 1974: Cocoyoc Declaration on Patterns of Resources Use, Environment and Development Strategies.
- 1975: Regional seas Programmes: Nine regional action plans adopted by 1991 (UNEP)
- 1975: International Environmental Education Programme (UNEP/UNESCO).
- 1976: Vancouver Action Plan for Human Settlements.
- 1977: Mar del Plata Action Plan for Water Resources Management.
- 1977: Plan of Action to Combat Desertification.
- 1977: Tbilisi Declaration on Environmental Education (UNEP/UNESCO).
- 1978: Buenos Aires Plan for Promoting and Implementing Technical Cooperation Among Developing Countries
- 1979: Vienna Programme of Action on Science and Technology.
- 1979: World Climate Impact Programme.
- 1980: World Conservation Strategy (UNEP/IUCN/WWF).
- 1980: Declaration of Environmental Policies and Procedures Relating to Economic Development.
- 1981: Global Strategy for Health for All of the Year 2000 (WHO).
- 1981: Nairobi Programme of Action for the Development and Utilization of New and Renewable Sources of Energy.
- 1981: Agriculture: Towards 2000 (FAO) Energy.
- 1981: World Soils Charter (FAO)
- 1990: International Drinking Water Supply and Sanitation Decade.
- 1982: Montevideo Programme for Environmental Law (UNEP).
- 1982: World Charter for Nature (UNGA)
- 1982: World Soils Policy (UNEP).
- 1983: Strategy for the Protection of the Marine Environment (IMO)
- 1984: Programme of Action on Agrarian Reform and Rural Development (FAO).
- 1984: Global Action Plan for the Conservation, Management and utilization of Marine Mammals (UNEP/FAO).
- 1984: Declaration of World Industry Conference on Environmental Management (WICEM).
- 1985: Strategy for Fisheries Management and Development (FAO).
- 1985: Action Plan for Biosphere.
- 1985: Tropical Forestry Action Plan (FAO, WIRI, World Bank, UNDP).
- 1987: Environmental Perspective to the Year 2000 and Beyond (UNEP).
- 1987: International Strategy for Action in the field of environmental Education and Training for the 1990s (UNESCO/UNEP).
- 1988: Global Strategy for Shelter to the year 2000 (UNCHS).
- 1999: International Decade for National Disaster Reduction.
- 1991: Strategy and Agenda for Action for Sustainable Agriculture and Rural Development (FAO).
- 1991: World Conservation strategy for the 1990s (WCN, UNEP, WWF).
- 1991: Declaration of the second World Industry Conference on Environmental Management (WICEM II).
- 1992: The Rio de Janeiro Conference (UNCED), also called the Earth Summit; Agenda 21 – a declaration of broad ecological, economic, and environmental principles adopted by more than 178 countries held.

- 1993: London Dumping Convention to Ban Nuclear Waste Disposal in Oceans formed.
- 1994: Global Conference on the Sustainable Development of Small Island Developing States held in Bridgetown, Barbados.
- 1994: UN Convention on Desertification held.
- 1995: UNIPF set up.
- 1995: The Berlin Climate Summit (also called the First Conference of the Parties (COP) to the Rio Convention held.
- 1995: World Summit for Social Development held in Copenhagen.
- 1995: Fourth World Conference held in Beijing.
- 1995: The Second Assessment Report of the IPCC released, and concluded the existence of “discernible human influence on global climate.
- 1996: World Food Summit held in Rome.
- 1996: The Geneva Climate Summit (also called the Second Conference of the Parties to the Rio Convention) held.
- 1997: Five years after Rio de Janeiro Review ESPF held at the Special Session of UN General Assembly to review and appraise the implementation of Agenda 21.
- 1997: Kyoto Protocol on GHG emissions worked out.
- 1998: Buenos Aires Agreement on GHG regimes reached. (Sources: Rao, 2000 and UMEP, 1992).

Major International Environmental Agreements

According to UNEP (19920 reports, before World War II, few international environmental agreements existed. Only a few institutions existed such as the long-established World (originally), Meteorological organization, founded in 1873 to co-ordinate world weather observations and promote the understanding of climate, and the International Council of Scientific Unions which, founded in 1919 as the International Research Council, began to promote and co-ordinate international science. Most of the environmental agreements concentrated on protecting migratory birds and animals managing transfrontier river basins and boundary waters and conserving marine fish and mammals. However, from 1944 onwards, there was a surge of institution building. The Food and Agricultural Organization, the World Health Organization and UNESCO were all established between 1945 and 1948. Within a few years, new agreements were concluded protecting the oceans and living marine species, governing Antarctica, and banning nuclear tests underwater, in the atmosphere and outer space, and Antarctica. Besides, the Treaty on principles governing the Activities of States on the exploration and use of Outer Space, including the Moon and other Celestial Bodies, signed on 27 January 1967, obliged states engaged in studying or exploring outer space to avoid harmful contamination and adverse changes in the environment of the earth.

World War II highlighted the importance of consultation and dialogue to identify potential sources of friction early on, and so avoid future conflicts. The UN Charter not only established the United Nations itself in 1945 but contemplated that specialized agencies in economic, social, cultural, educational, health and related fields would be linked to it ‘with a view to the conditions of stability and well-being which are necessary for peaceful and friendly relations among nations. The Charter also called for the establishment of regional arrangements to further these ends (UN, 1945).

As this network of international institutions evolved, it was inevitable that specialized organizations and programmes would be founded to promote the cooperation that is essential if transboundary resources and the global commons are to be preserved. The International Union for Protection (later Conservation) of Nature and Natural resources (IUCN), founded in 1948 with both state and non-governmental members, was charged with protecting natural areas and species. Others, including the International Maritime Organization (IMO), the International Labour Organization (ILO), and the World Health Organization (WHO) stemmed from efforts to protect the human environment by ensuring human health and safety.

The following are the results of international institutional interventions and efforts:

Early Initiatives

- 1906: Convention concerning the Equitable Distribution of the Waters of the Rio Grande for Irrigation (US-Mexico water treaty).
- 1909: Boundary Waters Treaty concluded between Great Britain (on behalf of Canada) and the United States.
- 1911: Convention for the Protection and Preservation of Fur Seals.
- 1923: convention for the Preservation of the Halibut Fishery of the Northern Pacific Ocean and the Bering Sea.

- 1931: Convention on the Regulation of Whaling.
- 1940: Convention on Nature Protection and Wildlife Preservation in Western Hemisphere.
- 1946: International Convention for the Regulation of Whaling.
- 1951: International Plant Protection Convention.
- 1954: Convention for Prevention of Pollution of the Sea by Oil.
- 1958: Convention on Fishing and Conservation of the Living Resources of the High Seas.
- 1959: Antarctic Treaty.
- 1964: Agreed measures on the Conservation of Antarctic Fauna and Flora.
- 1963: Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water.
- 1967: Treaty in Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Celestial Bodies.

Later International Agreements

Species and Habitat:

- 1971: Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention) IUCN/IWRB.
- 1972: Convention Concerning the Protection of the World and Natural Heritage (World Heritage Convention) UNESCO.
- 1973: Convention on International Trades in Endangered Species (CITES – UNEP).
- 1979: Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) UNEP.
- 1980: Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR – CCAMLR Secretariat).
- 1991: Protocol to the Antarctic Treaty on Conservation.

Marine Pollution

- 1972: Convention on the Prevention of Pollution by Dumping of Wastes and other matter (London Dumping Convention) – IMO.
- 1973: International Convention for the Prevention of Pollution from Ships and the Protocol of 1978 Relating thereto with Annexes (MARPOL 778) – IMO.
- 1982: UN Convention on the Law of the Sea (LOS Convention) – United Nations Office of Ocean Affairs and Law of the Sea – OLAOS.
- 1985: Montreal Guidelines for the Protection of the Marine Environment against Pollution from Land-Based Sources.
- 1990: International Convention on Oil Pollution Preparedness, Response and Co-operation – IMO.

Hazardous Substances

- 1986: Convention on Early Notification of Nuclear Accident – IAEA.
- 1986: Convention on Assistance in the Case of A Nuclear Accident or Radiological emergencies – IAEA.
- 1987: Cairo Guidelines and Principles for the Environmentally Sound Management of Hazardous Wastes – UNEP.
- 1989: Convention on the Control of Transboundary Movements of Hazardous wastes (Basel Convention) – UNEP.
- 1991: Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movements and Management of Hazardous Wastes within Africa.

Pollution of the Atmosphere

- 1979: Convention on Long-Range Transboundary Air Pollution (LRTSP) – UN/ECE).
- 1985: Helsinki Protocol on the Reduction of sulphur Emissions or their Transboundary Fluxes by at least 30 per cent.
- 1985: Vienna Convention for the Protection of the Ozone layer (Vienna Convention) – UNEP.
- 1987: Montreal Protocol on Substances that Deplete the Ozone layer (Montreal Protocol).
- 1988: Sofia Protocol Concerning the Control of Emissions of Nitrogen Oxides or their Transboundary Fluxes.
- 1994: Framework Convention on Climate Change (UNFCCC).

Health and Safety Chemicals

- 1977: Convention Concerning Prevention and Control of Occupation Hazards in the Working Environment Due to Air Pollution, Noise and Vibration – ILO.
- 1977: UN Chemical Safety Treaty.
- 1981: Convention Concerning Occupational Safety and Health and the Working Environment – ILO.
- 1992: Convention on Transboundary Impacts of Industrial Accidents.
- 1985: International Code of Conduct on the Distribution and Use of Pesticides – FAO.
- 1987: London Guidelines for the Exchange of Information on Chemicals in International Trade – UNEP.
- 1990: Convention Concerning Safety in the Use of Chemicals at Work – ILO.
- 1998: Rotterdam Convention on Hazardous Chemicals Trade.
- (Sources: UNEP, 1992 and Rao, 2000).

II. CONCLUSION

It has been highlighted above that human civilization has stimulated human activities, and human activities have caused great damage to the environment. For so long human activities were carried out with reckless abandon. It did not matter how these affected the natural world upon which depend on the survival of man.

Given the scenario of environmental damage caused by human activities, ‘cleaner’ production modes and new environmentally-benign technological alternatives have to be developed. This would require decreasing raw material and energy inputs, apply information technology to processes and products, finding biotechnological alternatives to physical and chemical processes and designing products offering less environmental damage or greater opportunities for recycling etc. However, it is expected that the design/production/consumption/disposal sequence may not always be completely clean. But there is always scope for ‘cleaner’ production. The solution lies in maintaining vigilance in monitoring environmental impacts over long periods, as well as sustained efforts in developing and deploying cleaner production methods.

Governments would need to achieve far greater integration of environmental considerations in the formulation of industrial and technological policies and plans, to promote the adoption of the ‘cleaner production’ concept. As a matter of deliberate policy, there should be the production of ‘environment-friendly’ goods and ‘eco-labelling’, as well as cleaner production methods. It is also axiomatic that development in human capacities through advancement in technological knowledge and skills presupposes new approaches to environmental protection as well as new environmental hazards. This demands alertness and sustained effort – through legislative and institutional technology assessment – in clearly identifying their full impacts, over the short and long term, as well as in preventing, or even minimizing, their negative impacts on the environment. In the final analysis, it requires pro-environmental policies by governments and institutions driving policies and actions that affect the environment to stem the cascading degradation of human activities sweeping across communities, urban landscape and national boundaries affecting the global environment.

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