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1. INTRODUCTION TO ENVIRONMENTAL CRISIS

1.1. Overview of the Environmental Crisis

It is well known now that our environment is in critical danger. Although the window is quickly closing, we still have a chance to change it, and even continue to reform our wasteful behavior. This may not necessarily be the case for the vast majority of underprivileged people around our planet who have to deal day-to-day with bare survival. For example, the poor cut down trees for firewood, drain the tiny bits of farm land that they own in a frantic attempt to generate food, pollute rivers because they lack proper sanitation facilities etc. The causes are many but mainly include human-induced environmental devastation, releasing chemicals that cause water, earth and air pollution, considerable damage to the habitats, indiscriminate uses of fuels, logging, mining, and overfishing, to name some of the crucial ones. These are all done with hi-tech machinery that leaves behind unmitigated damage and destruction.

The ecological Crisis from Bhopal, Three-Mile Island, and the Exxon Valdez oil spill all continue to wreak havoc. Chernobyl and other nuclear-related accidents continue on exposing all life on our planet to various types of nuclear radiation fall-out .Nuclear radiation does not recede or disappear with time. Some of it is short lived, some of it is everlasting. The half-life of uranium 238, for example, is 4.5 billion years (i.e., the amount of time it takes for half of the uranium to decay). The consequences of the US atomic bombs (dropped tragically on Hiroshima and Nagasaki) and consequences of the 1986 Chernobyl accident and both still continue to be supervised by Japanese and Russian scientists, as well as the DU bombing of innocent civilians in Iraq and now Gaza, all go beyond the sad killing of civilians to be transmitted on the winds and distributed around the entire world. The earth has a closed-loop system: what occurs in one place eventually travels to other parts of the globe. The entire world is shrouded in on-going nuclear radiation fallout. Although we get a certain amount of radiation for the sun, too, the incremental use by of nuclear warfare by governments is unlawful and unprincipled. Nuclear energy also creates concern for safety.

Recently, the United States was among the top country in greenhouse gas releases – 30 percent of it with the increased use of cars, trucks, buses, and the toxic releases from the power plants. China has now in the lead in the list with their own fuel use (oil, natural gas, and coal). Although fuel is instrumental for global energy, they are after all non-renewable resources. Our dependency on and the excessive use of oil, natural gas, and coal are not sustainable in the long run. At the advent of the 21st Century, we thought that the planet had infinite natural resources. It does not. Today, we are consuming 20 percent more of these resources than are actually available. These natural resources also come with high associated costs: considerable industrial pollution and little-to-no governmental oversight. We all endure a heavy body burden –literally massive amount of poisons in our bodies. For these reasons, amongst others, the environmental crisis presents a significant challenge to policy-makers and to several other organizations and individuals who must find innovative solutions to these issues - preferably, within an overall policy framework that places a strong emphasis on sustainable development.

1.2. Issues in Environmental Crisis

There are a broad range of environmental concerns that have taken place due to the environmental Crisis. These obstacles include anthropogenic climate change ('global warming'), the weakening of the stratospheric ozone (the 'ozone hole'), the acidification of surface waters ('acid rain'), the obileration of tropical forests, the reduction and extinction of species, and the alarming decline of biodiversity. Although, all of these problems have an effect on the environment physically, their origins as well as their answers to this problem are habitually connected to human attitudes, beliefs, values, needs, desires, expectations, and behaviors. Thus the dangers of the environmental crisis cannot be looked upon only as physical problems requiring solutions by environmental conversationalists; instead, they are inherently human problems and they are deeply connected to the actions taken by humans. Nonetheless, there is a general agreement that the environmental crisis include the following important issues.

- ✓ **Climate change:** anthropogenic climate change due to pollution of the atmosphere by greenhouse gases (and other contaminants) is now considered as one of the important global environmental issues. It happens primarily as a result of the combustion of fossil fuels, emissions from agriculture and pastoralism, and land-use changes that go hand in hand with the destruction, clearance and burning of forests. Climate change already has considerable ecological and social effects, and its projected impacts could potentially result in significant changes in global mean surface temperature, sea level, ocean circulation, precipitation patterns, climatic zones, species distributions and ecosystem function.
- ✓ **Stratospheric ozone depletion:** the weakening of the stratospheric ozone owing to the pollution of the atmosphere by halocarbons (such as chlorofluorocarbons, or CFCs) is another critical environmental issue. It is an important concern because the absence of protective ozone at high altitudes results in increased levels of harmful solar ultraviolet (UV-B) radiation reaching the earth's surface, triggering a range of health-related and ecological impacts.
- ✓ **Degraded air quality:** other forms of air pollution are also important, particularly at regional and local scales, as they may seriously degrade air quality; All over the world approximately one billion people inhabit areas - mainly industrial cities - where unhealthy levels of air pollution occur. Many air pollutants are responsible for the degradation of air quality, but some key pollutants include particulate matter (such as soot), tropospheric ozone, oxides of nitrogen, oxides of sulphur, lead and various aromatic compounds (such as benzene). Many air pollutants may cause or exacerbate respiratory and cardiovascular illnesses; some are known carcinogens; and some can spoil vegetation and, in effect, cause a range of ecological effects.
- ✓ **Degraded water quality:** similarly, water quality can be seriously degraded by contamination with pollutants, which can cause a range of health-related and ecological effects (such as the degradation of coral reefs). A major cause of water pollution is the terrestrial run-off to inshore waters that occurs in many coastal locations; such run-off may contain high elevated levels of nitrogen and phosphorus from agricultural land and from human settlements. Many other human activities lead to water pollution, including mining and industrial processes, which may create toxic effluent. Oil spills, accumulation of plastics and the bioaccumulation of persistent organic chemicals are some of the other causes of serious degradation of the marine environment.
- ✓ **Scarcity of fresh water:** besides the pollution of freshwater sources, there are a several other causes for the scarcity of fresh water for drinking in many parts of the world – a lot of them are related to inefficient water resource management practices. For instance, the over-utilization of

water from rivers results in water shortages and problems of salinisation downstream. Irrigation practices may also be held accountable for the reduction of local water sources and the salinisation of irrigated land. There is immense dissimilarity in water security that is present at the global scale, reflecting both demand for fresh water and the scale of public and private investment in water supplies, treatment and distribution.

- ✓ **Land contamination:** land contamination occurs due to chemical or radioactive pollution, especially by long-lived (persistent) chemical species that come in contact with the the soil. Land contamination may cause severe ecological effects and it inhibits development, since contaminated land must ideally be rehabilitated before it is safe to use for agriculture, construction or recreation.
- ✓ **Deforestation:** it has been estimated that around half of the world's mature forests have been cleared by humans. Deforestation happens due to several reasons, but the majority of deforestation now occurs when tropical forests are cleared for agriculture and pastoralism; other reasons include the cutting of trees for charcoal production and the selective logging of forests for timber. While tropical forests account for only around 6% of the earth's surface, they are a critical part of the global ecosystem and of the biosphere: they aid in regulating climate; they shield soils from erosion; and they provide habitats for a vast number of plant and animal species. One study suggests that around 90% of the world's species are found in tropical forests.
- ✓ **Soil erosion and degradation:** concerns about soil erosion, soil degradation and the problem of desertification have become paramount. In part, these apprehensions are based on the historical experiences of dramatic soil erosion and transport in New World countries including the USA (during the 'Dust Bowl' of the 1930s) and Australia. While analyses of the problems of soil erosion and degradation have become more evolved, recently, it is clear that these problems continue to have considerable consequences for agricultural and pastoral productivity as well as for the functioning of natural ecosystems.
- ✓ **Land use change and habitat loss:** these issues intersect with others, such as deforestation, but they are wider and include the clearance of forest for agriculture and pastoralism, the transformation of land during urban growth, the development of new infrastructure (such as roads), the drainage of wetlands, and the destruction and removal of coastal mangrove forests.
- ✓ **Biodiversity loss:** many plant and animal species are susceptible to extinction, owing to the spread of disease, the destruction and degradation of their habitats, and ongoing exploitation. In 1999, UNEP (1999) estimated that one-quarter of the world's mammal species and around one-tenth of the world's bird species faced a significant risk of total extinction. Threats to biodiversity are not confined to terrestrial ecosystems; serious concerns have been raised about the prospects of marine and coastal wildlife species as a result of the pollution, over-exploitation and acidification of ocean and seas.

1.3. Other related issues

Some issues linked with the environmental crisis are not strictly 'environmental', but are closely related to environmental issues. They include a range of economic, social, political and technological issues

- ✓ **Population growth:** the total human population has burgeoned since the introduction of agriculture, around 12 000 years ago, and it has increasingly progressed with time, largely as a result of increased food production and improved sanitation and health care. Achieving the first one billion of human population took most of human history, while the most current increase

of one billion was accomplish in little more than a decade. However, recent fall in the rate of growth of population have taken place in many parts of the world, and in some countries populations are now reducing. The total human population was around 5.9 billion in 1998; it currently goes beyond 6 billion people and is expected to have reached 9.4 billion people by 2050. The rising human population inescapably places greater demands on the natural environment - for habitat, resources and waste assimilation - although the extent to which the human 'population explosion' is causing environmental degradation is a multifaceted and a controversial question. Considerable differences exist in cultural attitudes to the issues of human population size and the rate of population growth.

- ✓ **Urbanisation:** the issue of urbanisation is indirectly related to that of population growth, since urbanisation is occurring in response to increasing population pressures in rural areas and to the increasing intensity of economic opportunities in cities - often in so-called 'megacities' (cities with populations exceeding 10 million people). Urbanisation is often connected to a range of social and environmental problems including overcrowding, congestion, pollution, public health issues, shortages of water for drinking, and inadequate sanitation. Urbanization is also related to another issue: the decline of rural communities.
- ✓ **Poverty:** while poverty is complicated and problematic to define, the persistence of poverty at all levels (from intra-household to global) represents an ongoing challenge, as accepted in most current development policies, initiatives and targets (such as the United Nations Millennium Development Goals (UNDP undated). There is immense dissimilarity in patterns of income, production and consumption are unmistakable at all spatial scales, and those patterns are reflected in characteristic patterns of environmental impact (although in some cases environmental impacts are 'exported', as in the case of radioactive waste that is generated in one country before being transported to another for processing or disposal).
- ✓ **Food insecurity:** in general, the rate of increase in total food production has gone beyond that of total population growth over recent decades, mainly due to improvements in agricultural practices and in water management techniques. However, the average values conceal enormous differences in the distribution and quality of food, and the lack of food security remains a serious challenge in many parts of the world. Debates about food production raise important environmental issues such as the use of genetically modified (GM) and genetically engineered (GE) seeds and produce.
- ✓ **Disease:** closely linked to the problems of poverty and food insecurity are issues of disease due to malnutrition, scarcity of water for drinking, poor sanitation, pollution, and inadequate shelter; those are often accelerated by the spread of infectious diseases such as malaria, cholera, tuberculosis and HIV/AIDS. Large differences occur in the responses of human societies to diseases, reflecting vast inequalities in health care spending and in funding for pharmaceutical and medical research.
- ✓ **Peak oil and energy security:** peak oil refers to the time at which maximum crude oil extraction occurs, after which the economically viable reserves diminish and the rate of oil extraction reduces. Some estimates suggest that peak oil will happen or has already occurred - early in the 21st century, with the assumption that alternative energy sources will need to be developed in sufficient time to serve as a substitute for oil. Regardless of the accuracy of predictions about peak oil, the issues of climate change and conflict respectively, are now driving debates about 'green' (decarbonised or renewable) energy sources and energy security.
- ✓ **Conflict and displacement:** conflict between human societies continues to create severe environmental degradation in adjunct to human misery and a wide range of social impacts. For instance, the use of depleted uranium munitions causes considerable land contamination, while

the effects of the displacement of large numbers of people from zones of conflict can wield pressures on adjacent ecosystems. Displacement of people does not transpire only in reaction to violence; globally, the effects of climate change are expected to result in the displacement of as many as 500 million environmental refugees.

- ✓ **Natural disasters:** While not essentially part of the environmental crisis, human populations are also faced with continuing threats due to the occurrence of natural disasters such as earthquakes, landslides, floods, tsunamis and wildfires. Although these hazards may be natural in origin, it is important to recognize that human susceptibility to natural disasters is rising, not only because human populations and settlements are on the rise in many marginal and dangerous areas, such as floodplains. Hence unsound practices - such as the construction of settlements on floodplains, or the heavy cultivation of marginal hill slope lands - may greatly augument the impacts of natural disasters on human societies and economies.

1.4. The causes of the environmental crisis

The causes of the environmental crisis have been the subject of considerable debate. However, in general, its main causes are now acknowledged to be

- ✓ Technological developments Throughout the human history - and especially since the Industrial Revolution - which have allowed humans to exert a greater bearing over natural resources and ecosystems
- ✓ Rapidly increasing human population which has led to considerable enhancement in human population density in several parts of the earth.
- ✓ Dramatic increases in resource and energy consumption - especially since the Industrial Revolution, and since around 1950 - which have compounded economic growth and rising standards of living in some parts of the world.
- ✓ The emergence and development of the capitalist world economy in which rising stream of people, resources, products, energy and waste have taken place, together with increasing environmental impacts
- ✓ Utilitarian attitudes towards the environment which have allowed the unrestricted exploitation of natural resources and ecosystems
- ✓ Short-term patterns of decision-making shown by many governments, companies and individuals, which place larger focus on short-term profit maximisation (or value maximisation) than on environmental protection.