Climate Change and Environmental damage: A Global Issue

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ABSTRACT: ***Exposure to environmental pollutants seems to be a major source of health hazards globally, with risks generating higher levels of pollution in industrialized countries, where poverty, a lack of investment in new technology and inadequate environmental laws combine. But the connections between air pollution and health effects are complex and often poorly characterized. Due to a lack of thorough control and intrinsic variations within every demographic group, for example, exposure levels are frequently unexpected or ambiguous. Exposures may occur through a number of exposure routes and mechanisms. Specific contaminants may be implicated in a wide range of health consequences, but little disease is directly related to individual pollutants. Long delay, the effects of cumulative exposures, and repeated exposures to different pollutants, which may all work synergistically, cause challenges in unravelling environmental and health contamination. Nevertheless, in recent years several attempts have been made to estimate the worldwide risk of illness as a consequence of environmental pollution, whether for years of mortality or of disability-adjusted life (DALYs). Pollution may be linked to approximately 8-9% of the total disease burden, although in industrialized nations somewhat higher. The major sources of exposure and air pollution inside are insecure water, poor ventilation and poor cleanliness.***

KEYWORDS: ***Atmosphere, Contaminants, Environmental, Pollution, Pollutants.***

1. INTRODUCTION

Despite the considerable progress achieved in recent years to clean up the environment, pollution remains a major issue that continues to represent a threat to human health. The most important issues in the developing world are undoubtedly traditional sources of pollutants, such as industrial toxins, poor sanitation, inadequate disposal, contamination of water and vulnerability to indoor air pollution caused by biomass fuels. However, even in emerging countries, especially among the lowest sectors of society, environmental deterioration persists. There have also been a broad range of new poisons in recent decades, not least those relating to transport by vehicle and the use of modern chemicals in the home, food, water treatment and pest control. Each of these pollutants is seldom found in very high amounts, although the health impact is usually far from serious or apparent. Few of the environmental problems that impact us now indicate significant relative dangers.

The serious problems of research result from the identification of small effects in the light of dosage uncertainty and human sensitivity and errors in measurement. In spite of this, the increasing number of people exposed to air pollution ensures that even modest increases in hazard ratio will result in significant public health issues in the future. The emergence of new kinds of exposure as well as new risk factors, such as endocrine disruptors, with the potential to have an effect on the quality of life further demonstrates that caution and action are still required in this situation. As the impacts of human activity and environmental protection issues grow more worldwide, the necessity to detect and address health risks linked with environmental pollution is becoming increasingly essential. However, effective action needs knowledge not just of the form of the issue, but also of the origins and underlying processes, since intervention will then be directed to where it is most needed and anticipated to have the most impact. The heart of the relationship between air pollution levels is examined in this chapter, as is the significance of environmental degradation to the worldwide burden of diseases discussed elsewhere in this book [1].

1.1 Greenhouse Effect and Greenhouse Gases:

Some greenhouse gases exist in the atmosphere naturally, whereas others stem from human activity. Natural greenhouse gases include water vapor, carbon dioxide, methane, nitrous oxide and ozone (Figure 1). Carbon dioxide is the main greenhouse gas that causes global warming. Chlorofluorocarbons (CFCs) also contribute significantly to global warming, although they are found in very tiny amounts. Carbon dioxide is one of the most common greenhouse gas emitted into the environment through human activities, such as solid waste combustion, fossil fuels (oil, natural gas and coal) and wood.

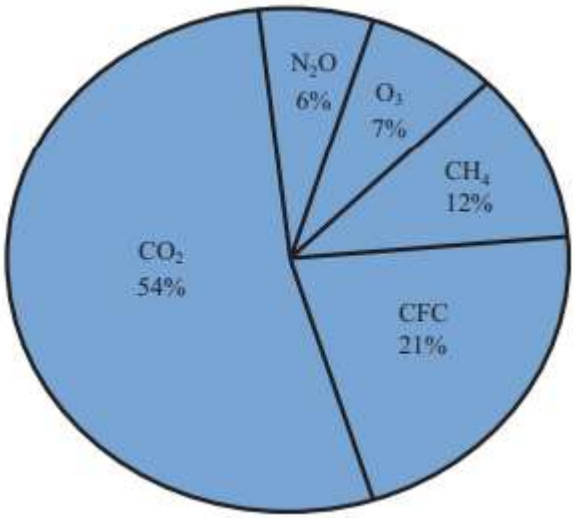

Figure 1: Relative greenhouse gas (GHG) contributions to global warming[2]**.**

Waste, fossil fuels (oil, gas, coal) and timber. Greenhouse effect is the process through which the Earth's atmosphere traps solar energy in the electromagnetic spectrum primarily in ultraviolet (UV), visible regions. This is mediated by greenhouse gases such as carbon dioxide, water vapor and methane that pass through input sunlight and absorb the heat emitted from the earth's surface. When solar radiation reaches the planet, some of it is reflected in space and portion of it absorbs the surface of the earth. The absorbed portion warms the ground and then radiates some of its energy into space in the IR area of the spectrum. A steady state is achieved in which the earth absorbs, radiates and produces an average temperature that is pretty consistent. However, the earth's IR radiation may be absorbed in the troposphere and trapped by greenhouse gases. The radiation is then radiated back to Earth, some known as the 'greenhouse effect' in all directions (Figure 2).

The average Earth's surface temperature is about 286 K or 13 °C. This causes temperature and global warming to rise. If there was no greenhouse effect, the earth's surface temperature would have been about 256 K or 17 °C, and life as we know could not exist without water since water would have remained in strong state at this temperature. Thus greenhouse gases (GHGs) create a blanketing effect on the lowest layers of the earth's climate, which is exacerbated by human activities such as fossil fuels, etc.[3].

1.2 Depletion of Ozone Layer:

The atmosphere of the earth is split into three regions: the troposphere, the stratosphere and the mesosphere. The stratosphere is 10 to 50 kilometers from the surface of the planet. A stratospheric ozone (O_3) layer shields the planet from damaging Ultra Violet (UV) light. Another important worldwide atmospheric problem attributable to human activity is the depletion of this layer. Solar radiation produces electromagnetic waves with a broad variety of wavelength and energy. Ultraviolet (UV) wavelength is somewhat shorter than the violet wavelength which is the shortest visible wavelength for human eyes. UV-B-radiation is 280–320 nm wavelength, whereas UV-A radiation is 320–400 nm therefore, given that energy is inversely related to wavelength, UV-B-radiation is more energetic and hence hazardous than UV-A-radiation[4].

UV light destroys protein and Deoxyribonucleic acid (DNA) molecules by entering the atmosphere and being absorbed by biological (live) tissues. Assume that, if complete amount of UV radiation falls from the stratosphere to the surface of the planet, all living creatures will be destroyed on earth. Since the majority of UV light (>99%) in the stratosphere is absorbed by ozone, stratosphere ozone is generally regarded as the ozone-shield. But a tiny amount of UV-B light escaping and reaching us from the stratosphere is responsible for sunburns and most skin cancers.

1.3 Global Warming Impressions:

In general, the quicker the climatic change, the higher the danger of harm. The main effects of global warming are:

I. *Global Temperature Increase:* Climate models indicate the global surface temperature is expected to climb by about 6°C during the 21st century. It now shows that most of the warming seen over the past 50 years is driven by human activity.

II. *Sea Level Rise:* This is one of the most definite effects of global warming. The average sea level worldwide is forecast to increase by 9–88 cm by 2100, which is far above the norm for the past 3000 years. Scientists predict that the sea level will continue to rise as a consequence of man-made greenhouse gas pollution and that it may reach an extra 3.5 inches up to 3 feet (9–88 cm) by the end of this century.

III. *Recede of Glaciers:* Glaciers retreat in virtually every mountain area in the globe in reaction to the warming environment. The ice shelf is a dam of glaciers on earth; its disintegration causes an alarming acceleration of glacier flow into the ocean that may increase the sea level.

IV. *Decreasing Agricultural Yield:* Water resources are impacted by global changes in precipitation and evaporation patterns. This will impact agricultural production, which will endanger food security as crop yields decrease. Food safety is expected to be challenged with food shortages and famine in certain areas.

V. *Disease Outbreaks:* The ripening of illness-inducing substances and organisms transmitted by them in particular mosquitoes and rodents producing disease and loss of life is accommodated by higher temperatures. For instance, the incubation time needed to transmit dengue fever following infection of a mosquito varies from 12 days at 30°C to 7 days from 32°C to 35°C, resulting in potential triple increases in disease transmission.

Subtropical deer are expected to expand; permafrost and sea ice retreat; more frequent severe weather events including heat waves, droughts, wildfires, heavy rains, inundations, and heavy snow, ocean acidification; and the loss of animals owing to changes in temperature regimes[5].

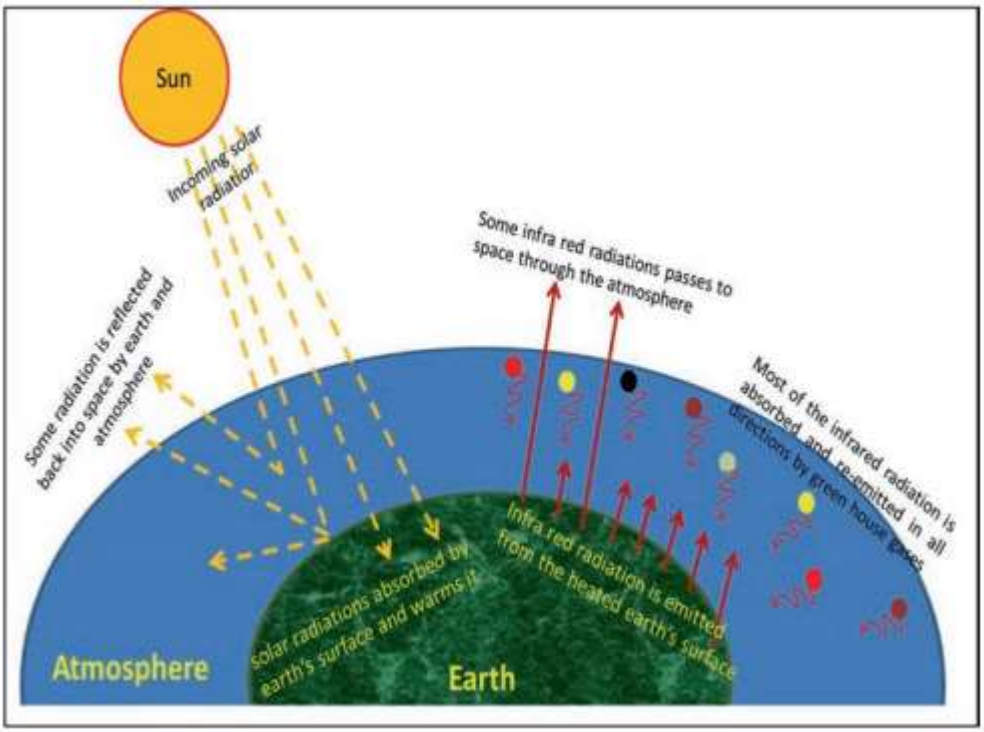

Figure 2: Illustrates the Greenhouse effect[2]**.**

1.4 Healthcare and Ecological Degradation Relations:

Environmental pollution, if very strictly defined, may be described simply as the presence of an environmental agent that might be harmful to the environment or human health. As such, pollutants take various forms. They not only include chemicals, but also creatures, biological materials and electricity in their various forms. The quantity of possible poisons is thus virtually limitless. For example, nowadays there are approximately 30 000 compounds in widespread use, any of which may be released into the atmosphere during manufacture or usage. Less than 1% of them are submitted to a thorough assessment in terms of toxicity and health concerns. The amount of biological pollutants is really unquantifiable. They not only include living and viable cells like

bacteria, but also a broad range of endotoxins that may be made from a protoplasm of organisms after death. However, there is no shortage of potential environmental health risks. Mostly, a knowledge of the presence and processes of these dangers does not exist[6].

2. DISCUSSION

There is a dynamic as well as a dependent process at work in the connection between pollution and human health. A toxin's influence on one's well-being is dependent on the amount of the contaminant or its degradation products that are administered to sensitive people in order for them to be apparent. These people would have been subjected to the pollutant many times, often over a considerable length of time or multiple times in a short period of time. These exposures need humans and pollutants to be exposed to the same environments at the same time. Not only must the contaminants be discharged to the environment, but also disseminated via them through media utilized or accessible to people[7]. The health impacts of environmental emissions are therefore far from inevitable except for intrinsically harmful contaminants; they rely on the coincidence both of emission mechanisms and of the dispersion mechanisms which dictate where and when the pollutant appears in the atmosphere, and on human activity that determines where and when it happens in these same areas[8]. Figure 3 illustrates the climate change impacts highlight need for action at COP24.

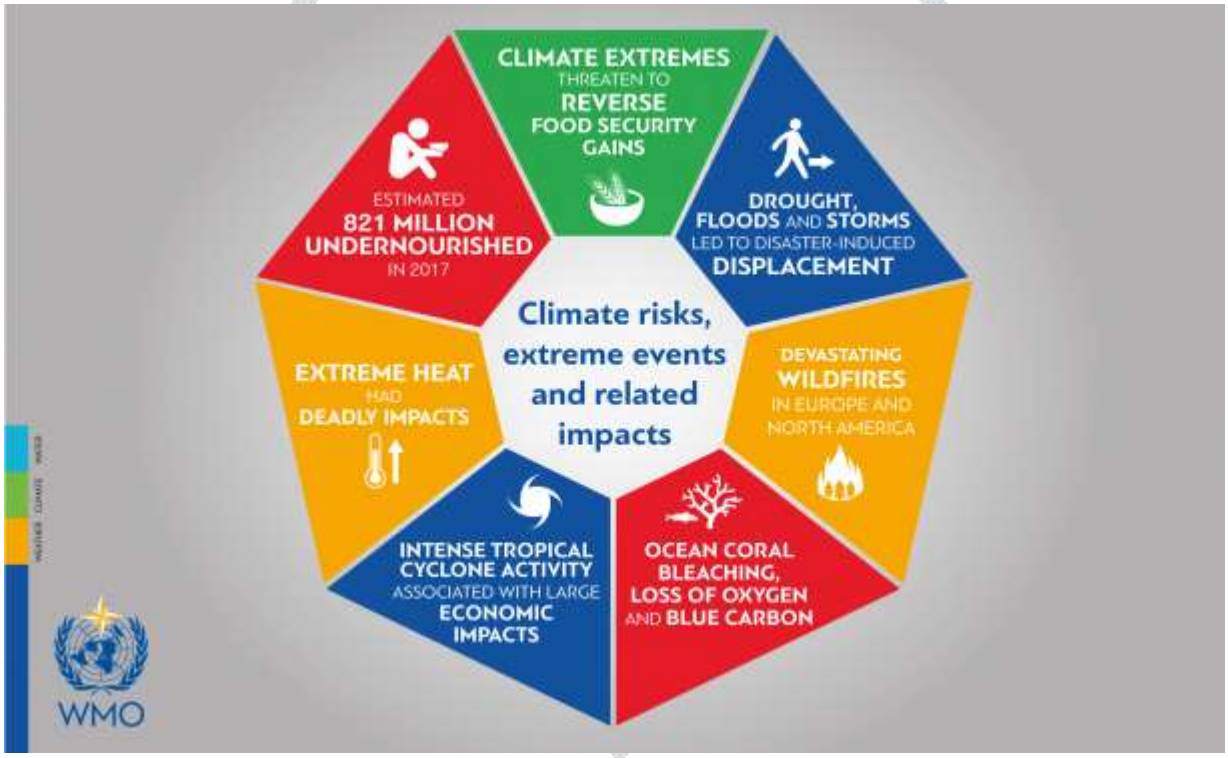

Figure 3: Illustrates the climate change impacts highlight need for action at COP24 [World Metrological Organization].

Simply said, the whole method may be described as a causal chain that runs from origin to effect. If this is true, then the majority of toxins are created by humans in nature. They are produced by human activities like the generation of electricity, transportation, household activities, waste disposal, agriculture, and leisure. It is possible that natural emission sources will be substantial in certain circumstances, but this is unlikely. Among the substances released by the dissolution of radioactive material in the Earth's crust are radon, arsenic released by rock formation sources into underground water, toxic metals that accrue in surface sediments from raw material rock actually contains rocks, and particles released by wildfires or volcanic activity, as well as Sulphur dioxides. The release of contaminants from these many pathways happens in a variety of forms and mediums, including the atmosphere, surface waters, soil, and groundwater. Because sources and atmospheric emissions are seldom visible, it is unavoidable to make only rough estimates of their magnitude. Instead, the vast majority of pollutant inventory levels are known as a form of simulation, either through the use of emissions factors for various processes as well as source activities5 or through the use of input-output models, which measure the

difference in the amount of input material used in the process and the amount of output material used in the finished product [9].

Other media, such as surface water, soil and ground water, are also released through a variety of processes. All substances have major implications for aqueous contaminants, deliberate dumping, spills. Regulatory criteria for dumping rivers to keep levels of pollution within agreed limits are established for specific industries. However, unlawful discharges or unintentional leaks occur frequently and in 2001 they accounted for the bulk of reported instances of surface water leakage in the United Kingdom (UK), the source being known. Dumping is a major source of solid waste emission, both officially and illegally at locations, but it can only be released in the wider atmosphere if these materials degrade or disintegrate. As a consequence, waste disposal facilities may be liable for emissions of a variety of contaminants through different pathways, in particular if these sites are inadequately screened or maintained. The significance of casual and illegal dumping for atmospheric pollution is unavoidable[10].

3. CONCLUSION

When it comes to the relationship between air degradation and health, there are numerous complexities to consider, not least of which are the inherent inaccuracies in available morbidity and mortality data, existing knowledge of disease etiology, environmental and exposed information, all of which make it hard to evaluate any attempt to evaluate the environmental contribution of disease to the global burden of disease. As a result, the estimations provided so far must be regarded as little more than approximations of the order of magnitude. Given these restrictions, certain assumptions, on the other hand, seem to be unchallengeable. As a starting point, air degradation has a substantial impact on a wide variety of health consequences, which in many cases leads to a major public health concern in the community. In addition to water pollution, poor hygiene and sanitation are major risk factors, as is indoor air pollution (and to a lesser extent, air pollution and chemicals). These variables are present both inside and outdoors. Radiation and noise, both ionizing and non-ionizing, are also a source of concern in many instances.

As a second point, it should be noted that the worldwide distribution of risks resulting from these factors does not seem to be equal. Despite the fact that estimating the global burden is difficult, there are significant disparities between the industrialized and developing economies, between the affluent and the poor, and often between adults and children. The industrialized world is not without its risks, and development is not a panacea for all health issues in every country. In fact, it is frequently the case that the reverse is true. Growing reliance on automobiles, greater use of chemicals in agriculture, and more time spent in contemporary, hermetically sealed buildings accompanied by chemical fabrics and processes may all result in increased exposure and health risks. Overall, however, pollution has a much greater impact on the developing world, and the severity of the effect is rising in many instances as development pressures add to traditional occupational exposures and danger. Third, and perhaps most importantly, many of these risks and health effects may be avoided with a little effort. In most cases, advanced systems or even costly medications are not the solution. It is rather necessary to take precautionary measures in order to reduce pollution emissions into the environment, which is now possible given current technological advances and knowledge. Indeed, it has already been implemented in a number of cases by several of the world's wealthiest countries. As a result, science has unquestionably a role to play in resolving these problems. More research is definitely required on a number of emerging environmental health concerns. But it is not so much a lack of scientific and technological advances that has allowed pollution to continue to harm people's health as it is a lack of political will and economic independence that has allowed pollution to continue to do so. People who are at the vulnerability of environmental deterioration must ultimately seek salvation, according to this perspective.

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