

Environmental Degradation and Human Disease

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ABSTRACT: Human health is strongly linked to the health of ecosystems. However, destruction of natural resources such as soil, water and the atmosphere not only effect the terrestrial fauna and flora, but also resulted in unprecedented levels of disease emergence which potentially cause severe future impacts on human health. Many important human diseases have originated in micro- and macro-organisms, thus, changes in the habitats of these populations may affect the mode of action as well as their pathogenicity. In addition, the continuous degradation of ecosystems is leading to increased susceptibility to disease caused by these organisms. The adverse health impacts will be much greater in low-income populations than in richer nations. Thus, there is a great need for collective action to prevent environmental degradation.

Keywords: environmental degradation, human disease, health, ecosystems

Introduction

Environment can be defined as (1) the circumstances or conditions that surround an organism or group of organisms, or (2) the complex of social or cultural conditions that affect an individual or community (Cunningham & Saigo 1997). Environmental component such as forests provide many of human essential resources, such as lumber, paper pulp and grazing lands for livestock. They also provide essential ecological services including regulating climate, controlling water runoff, providing wildlife habitat, purifying air and water and supporting rainfall. Forests also have scenic, cultural and historic values that deserve protection. Human constantly interact with their environment; it helps shape their lives and it affects their health.

In recent years, however, as technological power to disrupt natural systems has increased, human view of themselves with respect to nature has changed. They now can change the course of rivers, create vast artificial lakes, turn woodlands and grasslands into deserts and literally move mountains. Any physical, biological or chemical changes in the quality of the environment that adversely affects living organisms or makes environment unsuitable for desired uses can be considered pollution.

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Human is the most significant agent of environmental change. Environment and their resources are threatened directly or indirectly by human activities. Human activity impacts upon the quality of the environment. Some of the earliest recorded scientific studies of environmental damage were carried out in the eighteenth century by French and British colonial administrators who often were trained scientists and who observed rapid soil loss and drying wells that resulted from intensive colonial production of sugar and other commodities. Some of these colonial administrators considered responsible environmental stewardship as an aesthetic and moral priority, as well as an economic necessity. The undesirable effects of pollution probably have been recognized at least in 1273, when King Edward I of England threatened to hang anyone burning coal in London because of the acrid smoke it produced. Later, in 1273, the English diarist John Evelyn complained about noxious air pollution caused by coal fires and factories.

Destruction of tropical forests, coral reefs, wetlands, toxic air and water pollutants, along with mountains of solid and hazardous wastes, are becoming overwhelming problems around the world. Therefore, the health effects of pollution and environmental ills of modern society have become a greater threat to human life than infectious diseases.

The causes of environmental degradation

In normal situation, poorest people have become both the agents and the victims of environmental pollution and degradation. They are forced to meet

short-term survival needs at the cost of long-term sustainability. For example, in order to get croplands, they move into virgin forests or cultivate steep, erosion prone hillside where soil nutrients are exhausted after only a few year. Others migrate to the grimy, crowded slums and ramshackle shantytowns that now surround most major cities in the developing world. With no way to dispose of wastes, the residents often foul their environment further and contaminate the air they breath and water on which they depend for washing and drinking. Faced with immediate survival needs and few options, these unfortunate people often have no choice but to overharvest environmental resources.

On the other hand, developed country polluted the environment as well. People in highly developed

countries are extravagant and wasteful consumers; their use of resources is greatly out of proportion to their numbers. A single child born in a highly developed country causes a greater impact on the environment and on resource depletion than do 12 or more children born in a developing country.

The United States, for instance, with less than five percent of the world total population, consumes about one quarter of most commercially traded commodities and produces a quarter to half of most industrial wastes (**TABLE 1**) (Cunningham & Saigo 1997). The disproportionately large consumption of resources by the United States and other highly developed countries affects natural resources and the environment as much as more than population explosion in the developing world.

TABLE 1- The United States Consumes of Commodities and Produces of Wastes

Consumes	Produces
26 percent of all oil	50 percent of all toxic wastes
24 percent of aluminum	26 percent of nitrogen oxides
20 percent of copper	25 percent of sulfur dioxides
19 percent of nickel	22 percent of chlorofluorocarbons
13 percent of steel	22 percent of carbon dioxide

Environmental factors and human disease

Health is a state of physical, mental and social well-being, not merely the absence of disease or infirmity. The cause or development of nearly every human disease is at least partly related to environmental factors. The human body is exposed to many kinds of chemicals in the environment, both natural and synthetic chemicals.

It is often difficult to establish a direct relationship between environmental pollution and disease. The relationship is fairly clear for certain pollutants, such as the link between radon and lung cancer or between lead and disorders of the nervous system. However, the evidence is less definite for many pollutants and scientists can only suggest there is an “association” between the pollutant and a specific illness.

Human health has improved significantly over the past several decades, but environmental factors remain a significant cause of human disease. Epidemiologists, are establishing increasingly strong links between human health and human activities that alter the environment. According to United Nation World Health Organization, about 25% of disease and injury worldwide is related to environmental changes caused by humans. The environmental component of human health is sometimes obvious, as when people drink unsanitary water and contract a waterborne disease

agent that causes a condition such as diarrhea. Each year diarrhea causes 4 million deaths worldwide, mostly in children (Raven & Berg 2005).

The health effects of many human activities are complex and often indirect. The disruption of natural environments may give disease-causing agents an opportunity to break out of their isolation. Development activities such as cutting down forests, building dams and agricultural expansion may bring more humans into contact with new or rare disease-causing agents. Alternatively, such projects may increase the spread of disease by increasing the population and distribution of disease-carrying organisms such as mosquitoes. Social factors may contribute to disease epidemics. Human populations increasingly concentrate in large cities, permitting the rapid spread of infectious (disease-causing) organisms among people. Global travel has the potential to contribute to the rapid spread of disease as infected individuals move easily from one place to another (Raven & Berg 2005).

In some regions of the world such as Peru and Bangladesh, the incidence of malaria is increasing, in part because of environmental changes. Areas of recently cleared forest tend to have small, temporary pools of water that provide ideal sites for mosquitoes to breed. The incidence of malaria is demonstrably higher in parts of the Amazon where the forest was cleared and the human

population has expanded because of colonization. Human-induced changes in world climate will affect the incidence of malaria by allowing the malaria-transmitting mosquito to expand into areas that are not currently part of its range. During the recent global warming trend, malaria was noted at higher elevations in the tropics, which are warmer than they were previously. Furthermore, global warming and changes in biological diversity, influence pathogen evolution and their ability to migrate to new areas. As a result, disease such as tuberculosis is now re-emerging as major threats, while new deadly diseases such as SARS and H1N1 have been developed.

In recent years, the increase in carbon dioxide in the atmosphere and the resultant more frequent and more severe heat waves during summer months because of global warming will cause in the number of heat-related illness and deaths, particularly of elderly people. During the summer 1998 heat wave in Dallas, Texas, more than 100 people died from heatstroke and other heat-related illness. India recorded almost 1300 deaths from high temperatures during the 1998 summer heat wave. France seemed to be particularly badly affected in the August 2003 heatwave with a 14,802 extra deaths.

For the case of air pollution, the health effects of ozone depletion are both direct and indirect. Direct effects include skin cancer, eye damage and damage to the immune system. Indirect effects include damage to terrestrial and aquatic ecosystems, which themselves generate further consequences for the environment and human health. In the case of acid rain, there may be increased airway reactivity and asthma although this is likely to be a small effect, if any. The presence of negative health effects from the toxic metals in groundwater is suggested, but as yet unproven. There may also be a bio-accumulation of toxic metals such as mercury in fish which can then enter the human food chain.

Noise may produce from jet planes, vehicles, railway engines to factory, generators, construction machinery, television and radio sets. More than 40 percent of cobblers, fruitsellers, shopkeepers and drivers complain of tinnitus in the ears. Continuous exposure may lead to deafness/permanent loss of hearing. WHO statistics suggest that around 5

percent of the school children suffer from varying degree of deafness. According to US Public Health Service, more than 7 million people are working in a place where noise levels are high enough to damage hearing (Rana 2006). Noise promotes the development of several non-auditory health effects including speech disturbances, sleep problem, insomnia, annoyance, hypertension and physiological disorders. These are neurosis, anxiety, insomnia, hypertension, sweating giddiness, nausea and fatigue. Cardiovascular system is specially vulnerable to high levels of noise. Chronic noise may lead to abortions and congenital defects.

Conclusion

Many human activities have indirect impact to environmental pollution and degradation. The disruption of natural environments may give disease-causing agents an opportunity to break out of their isolation. Destruction of ecosystems such as tropical forests, coral reefs, wetlands, toxic air and water pollutants not only effect the component of the ecosystems such as flora and fauna but produce greatest impact on human diseases especially vector-borne diseases such as malaria and dengue. Furthermore, global warming and changes in biological diversity, influence pathogen evolution and their ability to migrate to new areas. Other pollutions such as burning fossil fuels produce energy, toxic gasses and tiny particles that can cause respiratory problems, cardiac problems and eventually cancer. Unfortunately, people lack basic needs like pure water and ample food become more susceptible to the diseases, thus the impacts is greater in low-income populations than in richer nations.

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