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**Environmental Hazards and Issues**

**of Human Health**

**Ahmad Ali**

**PG & Research Centre in Geography, Shibli National College,**

**Azamgarh – 276 001 (U. P.)**

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***Abstract :*** Hazard is a situation that can be dangerous or cause damage.  Environmental hazards encompass those elements of the physical environment, harmful to man and caused by forces extraneous to him. More particularly, it refers to all atmospheric, hydrologic, geologic (especially seismic and volcanic), and wildfire phenomena that, because of their location, severity, and frequency, have the potential to affect humans, their structures, or their activities adversely. The qualifier term even does not eliminate such exclusively manmade phenomena as war, pollution, infectious disease, chemical contamination, electronic and nuclear radiation, etc. Environmental factors tend to become a significant health issue, particularly in developing countries. An estimated 25% of death and disease globally, and nearly 35% in regions such as sub-Saharan Africa, is linked to environmental hazards. Some key areas of risk involveunsafe water, poor sanitation and hygiene , indoor smoke , malaria, urban air pollution , unintentional acute poisonings , climate change, the nature of geologic hazards, flooding, tsunamis, hurricanes, and hazards in arid and semi-arid areas; and any external factor that negatively affects human health can be considered an environmental health hazard. There is simply no escaping the cause and effect relationship between environment hazards and human health.

This paper outlines briefly how the environment vis-à-vis hazards can affect health. It establishes the links between environmental determinants and health. Interventions to improve health equity through the environment include actions and policies that deal with proximal risk factors in vulnerable zones, such as safe drinking water supply, reduced air pollution from household cooking and heating as well as from vehicles and industry, reduced traffic injury hazards and noise, improved working environment, and reduced heat stress because of global climate change. Interventions at higher policy levels that will create more sustainable and equitable living conditions and environs include improved planning and policies that take health aspects into account in every sector. Health equity also implies policies and actions that improve the global living environment, for instance, limiting greenhouse gas emissions (ICSU[12]).

**Objective :** How are environment and health linked? How many people does this hazard or risk affect? What kinds of policies and strategies have been adopted successfully elsewhere? What international laws, conventions or strategies govern or guide action?

**Data and Methodology :** Data source includes various figures published by different organisations and agencies globally. In this analysis of the work, it has been tried to use the qualitative methods and secondary data in the study of the relationship between environmental exposures and human health. Inclusion and exclusion criteria are described.

The global share of avoidable deaths is disproportionately high in poor countries. Poor people are more susceptible to environmental health threats. The high population density in many deprived areas means that interventions at a small scale level can assist many people, and existing infrastructure can sometimes be upgraded to meet health demands during the state of emergency in the wake of environmental hazards. Health risks caused by environmental hazards, avoidable with definite and factual policy framework, constitute a major breach of human security. In a global equity perspective, improving the living environment and health of the poor in developing country requires actions to be taken in the most affluent areas of the world (Collins *et al*.[6]).

Functioning health systems are required to translate commitment into action, while civil society participation supports government accountability. Improved commitments and better governance at global level are essential for national-level improvements. This includes making financial and technical resources available from high-income countries to be rendered in low-income countries for urgent interventions for health security.

***Introduction :*** Human being finds itself in a historically unprecedented hegemonic juncture. Not only can it do what it likes with global resources, but it is also master of its own destiny.

Hazard issomething that is potentially dangerous or harmful, often the root cause of an unwanted outcome (DHS, NIPP[8]).Environmental degradation is one of the ten threats officially declared by the ‘High-level Panel on Threats, Challenges and Change’ of the United Nations (UNO[18]).World Health Organization (WHOQOL Group[21]) defines, “Environmental health comprises those aspects of human health, including quality of life, that are determined by physical, chemical, biologic, social, and psychosocial factors in the environment." It also can be any external factor that negatively affects your health can be considered an environmental health hazard***.*** In developing countries with large rural populations, people continue to suffer from traditional risks like unsafe water, inadequate sanitation and hygiene, and indoor smoke from domestic cooking and heating. In developing countries with large urban populations and more industry, people are exposed to additional environmental risks including exposure to urban, industrial and agrochemical pollution, as well as industrial accidents. More recently, concerns about the health impact of changes in climate and ecosystems have been raised (Brubaker *et al*.[4]). Health can be defined as not just the absence of disease, but as a state of complete physical, mental and social well-being (Ali[1]).

**Environmental Hazards :** Hazard is a situation that can be dangerous or cause damage.  'Environmental hazard' is a generic term for any situation or state of events which poses a threat to the surrounding environment. This term incorporates topics like pollution and natural hazards such as storms and earthquakes (https://typesof[11]).

**Hazards**

* Hazards are not the natural events.
* Hazards are not the actual disasters.
* Hazards indicate potential disasters.
* People help create environmental hazards and disasters by locating (settling) in areas where extreme natural events may or do occur.
* Natural hazards consist of the interaction between possible human use of an area and possible extreme natural events.

**Disaster and Hazard**

* A disaster is the impact of a natural or human-made hazard that negatively affects society or environment (Bolin[3]).
* In contemporary academia, disasters are seen as the consequence of inappropriately managed risk. These risks are the product of hazards and vulnerability. Hazards that strike in areas with low vulnerability are not considered a disaster, as is the case in uninhabited regions.
* When extreme natural events occur in areas occupied or used by people the effects of these events or the 'impact' results in a 'disaster' or 'catastrophe'.
* Hazard is both dynamic and functional.
* A disaster is a singular event that results in widespread losses to people, infrastructure, or the environment. Disasters originate from many sources, just as hazards do such as natural systems, social systems, technology failures (Cutter[7]).

Hazards, and the disasters that result when extreme events occur, are not ‘Designs of God' or 'freaks of nature'(Birkland[2]). They are human creations. They stem from human efforts to use the resources in an environment. What is a hazard to one group may, however, be a resource to another. For example, if an area is experiencing a drought and there is a sudden flood, the resulting run-off may fill long-depleted reservoirs. This would improve city water-supplies and/or water-based recreational facilities. The same rains may, however, cause disastrous flooding of parched farmlands and low-lying areas of urban settlements. A disaster results in losses to property, social disruption and human casualties.

**Environmental Health Hazards :**

* Land And Climate Related Hazards
* Atmospheric Hazards
* Water Related Hazards
* Food Hazards
* Vector Borne Hazards
* Domestic Hazards
* Occupational Hazards
* Infrastructural Hazards
* Others

**Other Environmental Health Hazards**

* Heat and Humidity
* High humidity impedes the body's ability to cool itself.
* This is a particular problem for the elderly.
* Stress: Excessive stress is associated with decreased immune function and an increased risk of environmentally related illness.

**Land and Climate Related Hazards(**McGuire[15])

* Floods : Common in both lowland coastal and inland areas, especially in Tropics and monsoon areas
* Storms
* Hurricanes
* Volcanic activity
* Earthquakes
* Soil erosion
* Drought
* Desertification

**Atmospheric Hazards**

* Out Door Pollution /Air
* Increasing problem in many urban areas due to road traffic;
* Also associated with old, heavy and manufacturing industries and mining wind-blown dust also a significant problem in some areas
* Breathing smoggy air can result in eye, nose, and throat irritation, acute and chronic bronchitis, asthma, headache, and malaise *(*physical discomfort*).*

**Outdoor Pollution Sources**(Cutter[7])

* Industry
* Vehicles: Cars and trucks
* Other sources such as gasoline stations, farm equipment, fires, and outdoor pesticide use.

**Primary Outdoor Air Pollutants**(Ibid)

* Pollutants of concern are
* [Ozone (O3)](http://envirohealthhouston.org/hazards/ozone.html)
* [Particulate Matter (PM)](http://envirohealthhouston.org/hazards/pm.html)
* [Carbon Monoxide (CO)](http://envirohealthhouston.org/hazards/co.html)
* [Nitrogen Oxides (NOx)](http://envirohealthhouston.org/hazards/nox.html)
* [Sulfur Dioxide (SO2)](http://envirohealthhouston.org/hazards/sulfur.html)
* [Lead (Pb)](http://envirohealthhouston.org/hazards/lead.html)
* [Volatile Organic Compounds (VOCs)](http://envirohealthhouston.org/hazards/voc.html)

**Water Related Hazards**

* Surface water
* In urban areas, primarily from industrial and domestic wastes
* In rural related pollution areas with co-use of waters for humans and livestock
* Drinking water Especially in areas without access to treated/piped water
* Contamination

**Water Pollution**

* fertilizers from home lawns and gardens, as well as agriculture;
* mercury from power plants and industrial waste;
* herbicides and insecticides;
* oil and other chemicals from roadway runoff;
* prescription medications, paint and other toxic substances disposed down household sinks and toilets;
* trash and sediment from construction sites;
* pet waste;
* faulty septic systems;
* run-off from industrial sources or sewage treatment plants; and
* hormone and prescription medications in human waste.

**Health Risks Associated With Water Pollution**(Rogers[17])

* Drinking or washing with contaminated water;
* Eating seafood from polluted rivers or bays;
* Eating crops watered with polluted water; and/or
* Swimming in polluted waterways.

**Food Hazards**

* Biological: bacteria, viruses, parasites.
* Chemical : heavy metals, natural toxins, sanitizers, pesticides, antibiotics
* Physical : bone, rocks, metal

**Biological Food Hazards**

* Insects
* Rodents
* Animals
* Microorganisms: Bacteria, viruses, parasites, yeasts, molds (a fungus that produces a superficial growth on various kinds of damp or decaying organic matter).

**Biological = Living Organisms**

* In Meat and Poultry:
* Salmonella bacteria (poultry and eggs)
* Trichinellaspiralis parasite (pork)
* On Fruits and Vegetables:
* E-coli bacteria (apple juice)
* Cyclosporaparasite (raspberries)
* Hepatitis A virus (strawberries)

**Chemical Food Hazards**

Chemical hazard: a toxic substance that is produced naturally added intentionally or un-intentionally.

* **Naturally-occurring :** Natural toxins - aflatoxins ( A potent carcinogen from the fungus Aspergillus; can be produced and stored for use as a bioweapon), marine toxins
* **Added intentionally :** Antibiotics, preservatives
* **Added unintentionally :** Cleaning agents, Pesticide Residues

**Physical Hazards in Food –** Physical hazard: a hard foreign object that can cause illness or injury.

* Inherent to the food or ingredient
* Bone fragment, feathers
* Contaminant during processing
* Stones, rocks, dirt, fingernails

**Vector Borne Hazards –** Any agent (person or animal or microorganism) that carries and transmits a disease.

* Water related vectors, e.g., malaria, guinea worm, schistosomiasis
* Animal related vectors, e.g., sleeping sickness, bubonic plague (A lymph node that is inflamed and swollen because of plague or gonorrhoea or tuberculosis).

**Domestic Hazards**

* Indoor Air Pollution
* Domestic problems -Often associated with over-crowding and poor living conditions.
* Sanitation: Severe problem in areas lacking organized sewerage system (e.g. in informal settlements).
* Waste handling: Associated especially with open waste dumps – e.g. communities living on, or regularly sorting through waste sites, etc.

**Common Indoor Air Pollutants**

* second-hand tobacco smoke;
* airborne mold and mildew;
* pet dander;
* lead-impregnated dust from old paint and some vinyl(A univalent chemical radical derived from ethylene) mini blinds;
* cockroach shedding;
* dust mite particles;
* combustion gases released by stoves, heaters, candles and fireplaces; and
* chemicals released by
  + dry cleaned clothes;
  + cleaning products;
  + room deodorizers;
  + office supplies;
  + carpets;
  + paints and sealers;
  + new furniture and pressed wood;
  + personal care products; and pesticides

**Occupational Hazards**

* Industrial Pollutants: Especially in hazardous and unregulated industries (e.g. informal sector).
* Occupational Accidents: Especially in hazardous/unregulated industries (e.g. informal sector).

**Workplace Hazards** (Hardoy[10])

Many jobs expose workers to environmental toxins like:

* Lead,
* solvents,
* Asbestos,
* Pesticides,
* Inks,
* Dry cleaning chemicals
* Molds and other substances in the workplace.

**Infrastructural Hazards**

* Traffic : Accidents and noise pollution, Growing problem in major cities.
* Industrial Accidents: Associated mainly with poorly regulated chemical industries.
* Contaminated land: Old industrial sites and waste-dumps.

**Noise Pollution**

* Traffic, trains, buses, lawn mowers(Garden tool for mowing grass on lawns), leaf blowers, helicopters, construction noise, low-flying recreational planes, jet skis, air-conditioning units.
* Exposure to noise levels higher than 85 decibels for long periods of time can cause permanent hearing damage.
* Lower levels may lead to cause stress, increase blood pressure, cause sleep disturbances which affect sleep quality as well as mood and performance.

**Hazards from Waste**

* Hazardous waste, defined as that which is toxic, corrosive, flammable, or ignitable needs to be disposed of properly.
* Municipal solid waste includes residential and industrial waste. Solid waste is usually disposed of in landfills or recycled
* Nuclear waste raise concerns about potential radiation exposure.
* Electronic waste materials such as lead, mercury and hexavalent chromium in one form or the other are hazardous
* Sources are commercial power plants, hospitals, and non-military sources nuclear power plants.

**Socioeconomic Factors**

* Income.
* Ethnicity, sense of community and other such factors.
* It needs to be noted that certain segments of society are disproportionately exposed to environmental hazards, and may be more vulnerable to such hazards than other populations.

**Low Income Residents –** In general, residents in low income, minority neighborhoods are more likely to live near :

* Chemical waste dumping sites;
* Electric power plants;
* Municipal incinerators;
* Solid waste landfills;
* Industrial plants; and
* Heavily travelled roadways.

**Health Statistics vis-à-vis Hazards**

* The number of people affected by environmental hazards increased from just over 700 million in the 1970s to nearly 2.4 billion in the first decade of 2000; and they are faced with health risk (Brundtland[5]).
* Global climate change is a newer challenge to ongoing efforts to protect human health .Climate change is estimated to be responsible for approximately 2.4% of worldwide diarrhoea, and 6% of malaria in some middle-income countries (WHO[20]).
* More than two billion people worldwide live in regions facing water scarcity (WWDR[22]).
* An estimated 25% of deaths and diseases globally, and nearly 35% in regions such as sub-Saharan Africa, is linked to environmental hazards (Kjellstrom[14]).

**Conclusions :**

* Unsafe water bodies, poor access to safe drinking water, indoor and outdoor air pollution, unhygienic or unsafe food, poor sanitation, inadequate waste disposal, absent or unsafe vector control, and exposure to chemicals and injuries have been identified as key environmental risks to human health in most countries, and more specifically in developing nations (Usman[19]).
* Environmental hazards adversely affect human health both directly and indirectly. The direct physical effects that occur during or afterthe incidence include mortality, injuries, infectious diseases, poisoning , diseases related to the physical and emotional stress caused by the hazard, and such other effects as hypothermia from loss of shelter (IPCC[13]).
* Indirect effects of hazards can also cause human injury and disease; increased rates of the most common mental disorders, such as anxiety and depression .Hazardous events cause adverse physical, mental and physiological effects. The physical effects may last about 12 months on average, while the psychological impacts last at least twice as long.
* Poverty and hazard are often closely related, as the poor often lack assets and entitlements that allow them to cope with the situation.
* In developing countries with large rural populations, people continue to suffer from traditional risks like unsafe water, inadequate sanitation and hygiene, and indoor smoke from domestic cooking and heating.
* In developing countries with large urban populations and more industry, people are exposed to additional environmental risks including exposure to urban, industrial and agrochemical pollution, as well as industrial accidents.
* In the event of the occurrences of hazards, the probability of unfavorable outcome eg that an individual will become ill or die within a stated period of time or age. It is the quantitative probability that a health effect will occur after an individual has been exposed to a specified amount of a hazard.
* Global climate change is, therefore, a newer challenge to ongoing efforts to protect human health.
* Risk assessment involves the clarification of the nature of a risk, including its probability of occurrence and likely intensity, and measuring its potential impact on people, property and the environment (Pine and William[16]).

**Preventive Measures :**

* Prevent the creation of a hazard in the first place.
* Reduce the amount of hazard brought into being.
* Prevent the release of existing hazard.
* Modify the rate or spatial distribution of release of hazard from its source.
* Separate, in time or in place, the hazard and that which is to be protected.
* Separate the hazard, and that which is to be protected by interaction of a material barrier.
* Modify the basic qualities of the hazard.
* Make that which is to be protected more resistant to damage from the hazard.
* Counter damage already done by the environmental hazard.
* Stabilize, repair, and provide rehabilitative corrective measures.

**Suggestions :** The underlining reasons for health issues concerning environmental hazards include inadequate or flawed policies, weak institutional capacities, shortage of resources, and low general awareness of environment – health connections among policy makers and in the community(EEA[9]). It needs to be done that governments re-orient their national policies to foster a greater contribution of environmental management towards public health. Specifically, governments may consider creating national frameworks and mechanisms for inter-sectoral action to adequately address the inter-connectedness between health and the environment, invest in the required infrastructure related to health and environmental services, build from past and current experiences, revitalize expertise in environmental management for health, and increase communication and community education to raise awareness of how individual practices can impact upon human health and the environment.

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