

COURSE : DISASTER MANAGEMENT (MA/ MSc PART I)

Paper : III

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Topic : Environmental Degradation and Disasters:

INTRODUCTION

Environmental degradation is the deterioration of the environment through depletion of resources such as air, water and soil; the destruction of ecosystems; habitat destruction; the extinction of wildlife; and pollution. It is defined as any change or disturbance to the environment perceived to be deleterious or undesirable.

The United Nations International Strategy for Disaster Reduction defines environmental degradation as "the reduction of the capacity of the environment to meet social and ecological objectives, and needs". Environmental degradation comes in many types. When natural habitats are destroyed or natural resources are depleted, the environment is degraded. Efforts to counteract this problem include environmental protection and environmental resources management.

Environmental degradation and disasters:

There is some evidence of causal links between environmental degradation and vulnerability to disaster. Natural disasters are often caused at least partly by the same kind of tampering with the natural environment that concerns ecologists - and their impact on that environment is no less devastating. For example, the worldwide incidence per decade of extreme weather events - defined as events such as typhoons, hurricanes, floods, and drought, that cause more than, say, 20 deaths - has increased about 50 percent on average each decade between 1900 and 1990, accelerating significantly since 1950.

The damage caused by extreme weather events has also escalated - increasing faster than population growth. Beginning with the 1950s (when comprehensive records began to be kept), deaths associated with these events have increased 50 percent each decade, whereas the corresponding population growth rate was only 20 percent. Economic costs per decade have also increased dramatically: from about US\$400 billion in 1950-59 to 90 times that value in 1980-89.

This may to some extent reflect improved observation and reporting of weather as well as increasing economic and population growth. But it is hard to ignore the apparent correlation between the frequency and severity of such natural disasters and growing local and global environmental degradation, especially in the second half of the twentieth century. It is also clear that developing countries are far more vulnerable than developed countries to both catastrophic events and deterioration of the environment.

Why are developing countries so vulnerable to disasters? As a result of poverty and population growth, the continual, uncontrolled alteration of environmental systems weakens the resistance of many countries to natural hazards. Vulnerability and poverty go hand in hand, and it is not easy to find quick fixes for them. Low agricultural output in depressed economic conditions forces farmers to increase the burden on agricultural resources and hence the likelihood of drought, floods, and landslides. Rangelands are heavily overgrazed and forest lands severely degraded by overexploitation and neglect. Acute shortages of firewood have accelerated the rate of deforestation, which, together with destruction of the vegetative cover on natural pastures, has increased the threat of floods and the deterioration and desertification of previously fertile land. Similarly, rapid population growth, especially in urban areas, has overburdened public services and natural resources. Many urban settlers are poor and cannot afford properly serviced home sites. They have become a great threat to the natural environment of cities. Landless squatters concentrate in fragile, often marginal areas, increasing the cost and magnitude of natural crises.

How environmental degradation intensifies disasters

One disaster often leads to another: high windstorms are followed by floods and landslides, floods by drought, and drought by pest epidemics and famines. Such chains of disaster result partly from the tendency of natural disasters to debilitate the environment; they are aided in this by some human activities. The same cycle results whether the cause of degradation is natural or springs from human effort. But environmental degradation intensifies the effects of disaster.

Floods are generally considered to be fast-onset disasters, but their root cause may be partly a history of progressive environmental degradation. Floods are generally triggered not by exaggerated rainfall but by the silting up of rivers, the reduced absorptive capacity of soil, flawed infrastructure planning, and inadequate maintenance of existing facilities. Uncontrolled deforestation, which contributes heavily to soil erosion and water runoff, sets the stage for flash floods and landslides.

Similarly, the unrestrained felling of trees and grazing of livestock that often accompany rapid population growth accelerate the degradation and increase desertification of overgrazed arid and semiarid ranges. In urban areas, poor planning, inappropriate design, faulty construction, inadequate maintenance, and squatter settlements on disaster-prone land all contribute to both environmental degradation and increased vulnerability to catastrophic events.

In many developing countries, overcrowding, congestion, poverty, unemployment, and inadequate infrastructure and services further weaken urban resistance to natural hazards. As a result of inadequate policies, accumulated garbage and human waste often turn a flooded area into an open, overflowing sewer.

Extensive development on high-risk sites, combined with deforestation and the dumping of solid wastes in rivers and canals, increases susceptibility to the landslides that often follow floods. Clogged drains are worse than no drains at all in flood-prone areas - and silted-up drains or riverbeds exacerbate a flood's impact on precarious soil. The geology and climate of some areas contribute to the prevalence of landslides. The warm, wet climate of the Caribbean, for example, makes it susceptible to landslides. In China, limited knowledge about landslide identification and prevention led to excavations on and the reactivation of ancient landslides. Numerous landslides occurred during the construction of the Baocheng railway (1954-57).

Drought is often attributed to nature's capriciousness - the uncontrollable, unpredictable lack of rain - but experts now question this association. Drought-induced famine has occurred in North Africa, with desertification of the Sahel, yet no evidence exists that rainfall levels in the past 100 years have declined there, in the Sahara (to its south), or in the Middle East. The Caribbean pseudo droughts in the midst of tropical rainfall reinforce the popular association of rainfall and drought. But lack of groundwater - not rainwater - appears to be the central cause of drought.

In Haiti, deforestation has reduced the soil's capacity to absorb water. Despite steady rainfall, waters run off the razed hillsides and offer little benefit to crops. To all intents and purposes, the effect is that of a drought, despite normal rainfall. Even in flat areas - such as rice paddies in the Philippines - pseudo drought has been traced to deforestation through traditional slash-and-burn agriculture. Overgrazing, over cultivation, and the inappropriate use of mechanized agricultural methods also contribute to the cycle of erosion and drought. The U.S. "dust bowls" in the 1930s came about after the prairies of the Great Plains were transformed into wheat farms. In the Soviet Union, the substitution of cereal crops for the natural groundcover of the Central Asian steppes in the 1950s led to desertification and drought in the mid-1960s. In the Sahel, overgrazing, deforestation, and over cultivation reduced the amount of topsoil and compacted what soil remained, leading to the rapid superficial runoff of waters that the soil barely absorbs. Whether torrential runoffs are considered floods or not, when waters slide over topsoil without penetrating it, the effect is drought or pseudo drought.

Deforestation leads to drought both directly and indirectly. In Nepal, the lack of firewood has led farmers to burn cow dung for cooking fuel, reducing the amount of available fertilizer and thus reducing the fertility of the agricultural land - increasing erosion even in areas far removed from forested areas. Continuation of the present trend may create a semi-desert ecology in the hilly region.