

# The advancing desertification

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ALL living things are governed by dominant principles, or rules. We all exist within a food chain: we both eat and are eaten. All nature is part of this food chain. If these living things interact as they should, in proper relation to the environment that surrounds them, they all co-exist in an overall balanced community. Moreover, if this balance is not disturbed, the organisms that eat and are eaten are subtly controlled so as to adjust their numbers according to the capacity of the environment.

The destruction of animal habitats is today the major threat to survival of endangered species of plant and animal. When habitats are destroyed - animals must move and adapt to other habitats or die. Owing to increasing exploitation and destruction of nature in recent times, there has been a reduction not only in the total number of wild plants and animals in the world, but also in the number of species. The latter represents a loss in the genetic resources of the earth. Biodiversity protection includes all human efforts to preserve wild animals and plants from extinction. It involves protection, preservation and management of wild species (both plant and animal) and their environment.

In the present years, each and every nation of the world has its own environmental problems in its geographical area. In most of the cases these problems are man's creation. Some species have become extinct due to natural causes, but the greatest danger to biological diversity results from human activities. The majority cases in recent depletion, both in plants and animals are due to the environmental changes arising from alternation, degradation and destruction of natural habitats, deforestation, urbanisation, technological development, war devastations, natural disasters and the desertification.

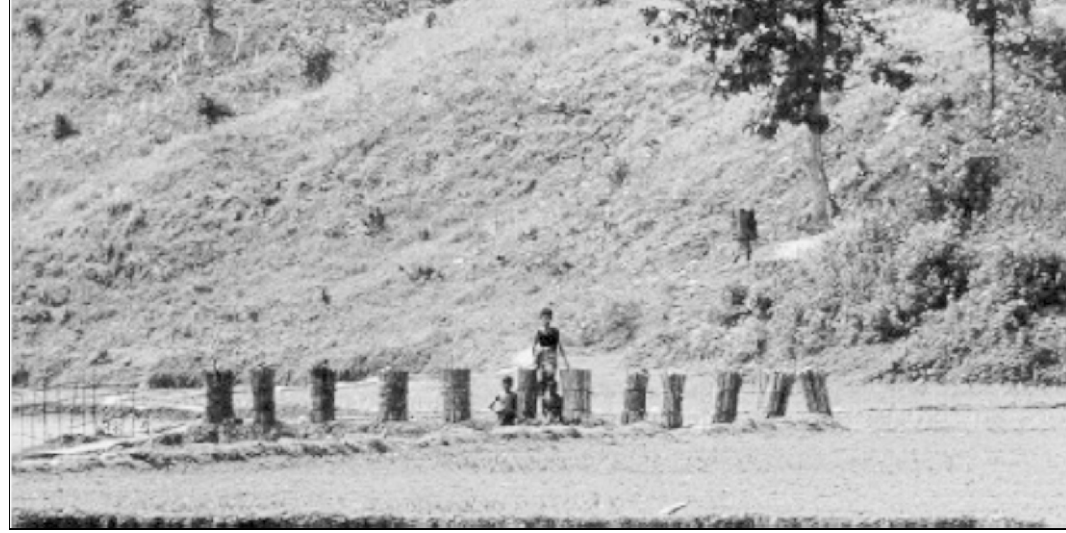
Deserts are extremely arid regions where rainfall is lower than 25 cm. a year, water evaporation is high (Hickman et al. 1984). Deserts generally occur in regions having less than 10 inches of rainfall that is very unevenly distributed. There are some reasons responsible for scarcity of rainfall like: a) high sub-tropical pressure; b) geographical position in rain shadows; and c) high altitude. According to various ecologists, from ecological standpoint, the desert could be of two types on the basis of temperature, namely hot deserts and cool deserts. In all deserts, the vegetation has a highly characteristic "spaced" distribution in which individual plants and animals have evolved a large assortment of adaptations to avoid the lethal extremes of temperature (Krebs, 1985). Desertification is the process in which the situation of an area turns into an arid zone because of climatic change as one of the major real causes. So, development of desert-like conditions involve changes in the

climate, soil properties, water table and other ecological as well as social conditions.

The plants are the source of energy of most of the living organisms, especially of the animals. The higher plants are in the central position of the terrestrial biological system. Since food is essential to all organisms, feeding relationships have been a central focus among ecologists, environmental specialists, biologists, and a theme that runs throughout the science. The plants do not provide only the nutritional source for the heterotrophic animals, but the suitable shelters and habitats for them.

These plants when come in assemblage with natural populations in an area, we call it most suitable and sustainable for the maintenance of biological diversity. This situation cannot sustain in an area when the fact of "desertification" appears there.

Bangladesh is the largest delta on the earth created by alluvial deposits of the three large rivers -- Ganges, the Brahmaputra and the Meghna. Including the largest ones, Bangladesh



A forest in Chittagong severely exploited by local people.

has seven hundred small rivers and a rainfall that may be one of the highest in the world. But the country is at the risk of desertification. According various experts, the problems of desertification in Bangladesh is real. The UNDP's 1995 report on Human Development in Bangladesh Environment suggests that time is running out for tackling Bangladesh's environmental problems and it calls for urgent action. The report identified that the growing population's demands, along with other related demands of agriculture and industry, are seemingly devouring natural resources at an alarming rate without replenishment. The biodiversity depletion is caused by degradation of land, erosion of valuable top soil, creeping salinity, overextraction of ground water, indiscriminate land conservation, declining soil fertility, waterlogging and

destruction of forests.

The whole-sale change of the country's environment is happening due to both human and natural causes. The country is situated at downstream of major transboundary rivers between India and Bangladesh. The diversion of Ganges water occurs at Farakka point located just 10 miles from the north-west border of the country. This situation is causing severe water shortage and is affecting the flora and fauna in the north-west region of Bangladesh. Because of Farakka barrage the water-flow was recorded at 9000 cusecs in 1994 March (with some insignificant variation in the recent years) in place of the 75000 cusecs in the same dry season before the barrage was built. To an ecologist it is not the question of why is such disturbance to nature. But it is the question of alteration of natural hydrological phenomenon over a geographical area in the biosphere. Such kind of alteration causes severe climatic changes in an ecological area where it has been functioning since long. This abrupt climatic change creates adverse situation for survival of biological resources (both plants and animals) there.

The consequential effect is desertification, and the population of elephants, rhinos, and other animals has seriously dropped in Central Africa. Drought is a major problem in Chad, erosion of precious topsoil is endemic. These are compounded by devegetation, caused by overgrazing of livestock and cutting trees and shrubs for firewood. The scarcities affect virtually every aspect of life, from agriculture to distribution of population of wildlife and biodiversity.

The desert in the south-east region of Mongolia contains almost no natural vegetation. Degraded or devegetated lands are on the increase. These areas are not easy to restore, and are at risk of becoming permanent part of the desert. In the country, arid climate affects seriously the wildlife grazing. Because of the reasons, Mongolia's forests and games protection has come at risk.

Scarcity of water affects Pakistan seriously because of inadequate rainfall, high rates of evaporation, and increasing salinity in the available water supply as a result of irrigation. Though Pakistan is rich in wildlife, and is home

to more than 6,000 species of plants, because of water scarcity the maintenance of its flora and fauna is coming under risk.

Biodiversity in many countries are severely affected by some causes which are not the direct reasons for desertification, but enhances the additive factors responsible for causing desertification. Loss of natural habitats in Australia causes destruction of wildlife. Because of the reason, many unique plants, mammals, birds and fishes are at risk of extinction. Only in south Australia, of the 102 native mammals, 28 per cent are extinct and about 40 per cent are in a position to be vulnerable to extinction.

In El Salvador, the loss of native plants and animals is very substantial. Most of the important species are now extinct, and little hope exists for successful reintroduction of these species because the environment too has been degraded. Guatemala's natural environments are exceptionally diverse. These ecosystems harbour a wide variety of the plant and animal species. Deforestation and other environmental and climatic changes are accelerating the rate of species extinction and thus reducing the country's biodiversity. As a consequence of deforestation (one of the important additive factors for desertification) and unguided settlement, Bolivia's rich natural habitats are under siege. Animal species, in addition, are in danger of extinction from illegal trafficking in hides and skin in the country. The expansion of economic activity has created conflicts between new settlers and the relatively small but increasingly vocal indigenous population of Bolivia.

Because of the additive factors, biodiversity in Bangladesh is depleted by deforestation, improper forest conservation, agro-chemical use and industrial establishments, large-scale development and flood projects, land use changes, and biological resource over-exploitation. Some of the above reasons contributed to the destruction of the natives and secondary forest diversity, including indigenous species. Encroachment on forest lands for agriculture and settlement, exploitation of resources like bamboo and canes, reduced freshwater flow in the Ganges river system, increased salinity intrusion in the Sundarban mangrove forest, converting forest for urbanisation and industrialisation are among the main causes for loss of biological diversity in the country.

During last 100 years, all species of rhinoceros, wild buffaloes, wolves and swamp deer have disappeared from Bangladesh. At least one reptile, the marsh crocodile, has disappeared from the wild. Among the listed 129 species of wildlife, the threatened and endangered included the list of 37 mammals, 21 reptiles, two amphibians and 69 birds. The tentative list of threatened plants includes 27 species of vascular plants, including nine endemic (Report: 1991).

Nature is all around us, and rightly belongs to everyone. But man has been greedy and exploited it on a first come first served basis. Unfortunately this wrong attitude has been encouraged with the result that we have been destroying irreplaceable aspects of nature at an alarming rate. We may not think it matters much what animals disappear from this earth. But the fact is that all living creatures, without exception, need each other in order to maintain a healthy balance and harmony in nature. Moreover, by destroying nature, man is driving himself steadily down the road to extinction too.

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Moreover, not only Farakka barrage over the Ganges, various types of water control structures have been constructed by India on about 50 shared rivers between Bangladesh and India. These water control structures are the major causes for desertification. The artificial shortage of water flows in common rivers affects Bangladesh seriously by drying up the river beds, shrinking country's flood plains, pushing down ground water level and providing further upward access of the salinity level in the south-eastern region.

Bangladesh is located between 22° and 26° north latitude, a geographical region within which a number of deserts in Asia and Africa are located. Four hydrological regions are present in Bangladesh: a) the north-western region; b) the south-western region; c) the central; and d) the eastern region. An area of about 29000 squares miles is being occupied by the north-western and south-western part of the country. This area takes more than half of the land area of Bangladesh. In this area the highest fluctuation of rainfall levels contributes to the development of drought and aridity. A study of SPARRSO reported that the country's south-eastern region experiences four arid months and the north-west region six arid months in a year. In our country, actually, water availability and water flow itself is locked in a race against time with rivers drying up, wetlands drained and ground water depleted without sufficient recharge.

Fifty per cent land area of our country is covered by wetlands. The physical size and ecological diversity of the country's wetlands are shrinking by various important causes, among the major ones are human activities like the flood embankments, water diversion, siltation and ground water extraction. Biodiversity deals with diversity within species, between species and ecosystems. The biological diversity is an accumulation or composition of genetic information, species and ecosystems, that is, variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part. Biological resources include genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems with actual or potential use or value for humanity. In terrestrial ecosystem, the first trophic level is the plant community. If plants are absent in an ecosystem, accumulation of energy in the form of organic molecules is lacking or totally absent, if so, the deforestation and desertification proceed, then biodiversity is frozen. Thus the situation that prevailed in the ecosystem causes loss of biodiversity.

When an area goes under desertification, changes occur there and go against the quick adaptability and survivability of the flora and fauna. Consequently negative pressures on the plant and animal populations bring serious depletion in the size of the populations. How the depletion in the population of the living organisms causes biodiversity loss may illustrate the situation with examples from different countries of the world. Burkina Faso is situated in Sahel region to which drought is endemic. Though due to the lack of rainfall desertification is caused here, population pressure and overgrazing also contribute to the situation. In Burkina Faso, herding on the plains leads to loss of vegetation, which in turn contributes to the destruction of soils and protective bushes and ultimately to desertification. This desertification affects the wildlife populations in the country. In Cape Verde the periodic drought is not a new natural disaster. The situation has become more severe as vegetation destroyed and soil is eroded. In the country, reforestation and revegetation are important for any permanent restoration of its environment and wildlife biodiversity.

In Central Africa the desertification problem is different. From Chad and Sudan nomads come into the Central Africa with a lot of cattle with them, and the cattle deplete grasslands and their productivity, while the herdsman cut bushes and trees in the savannas for