Desertification: Slow onset of an irreversible disaster

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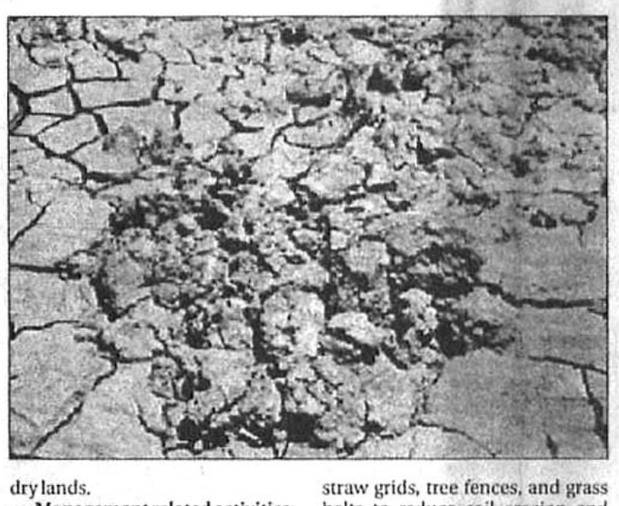
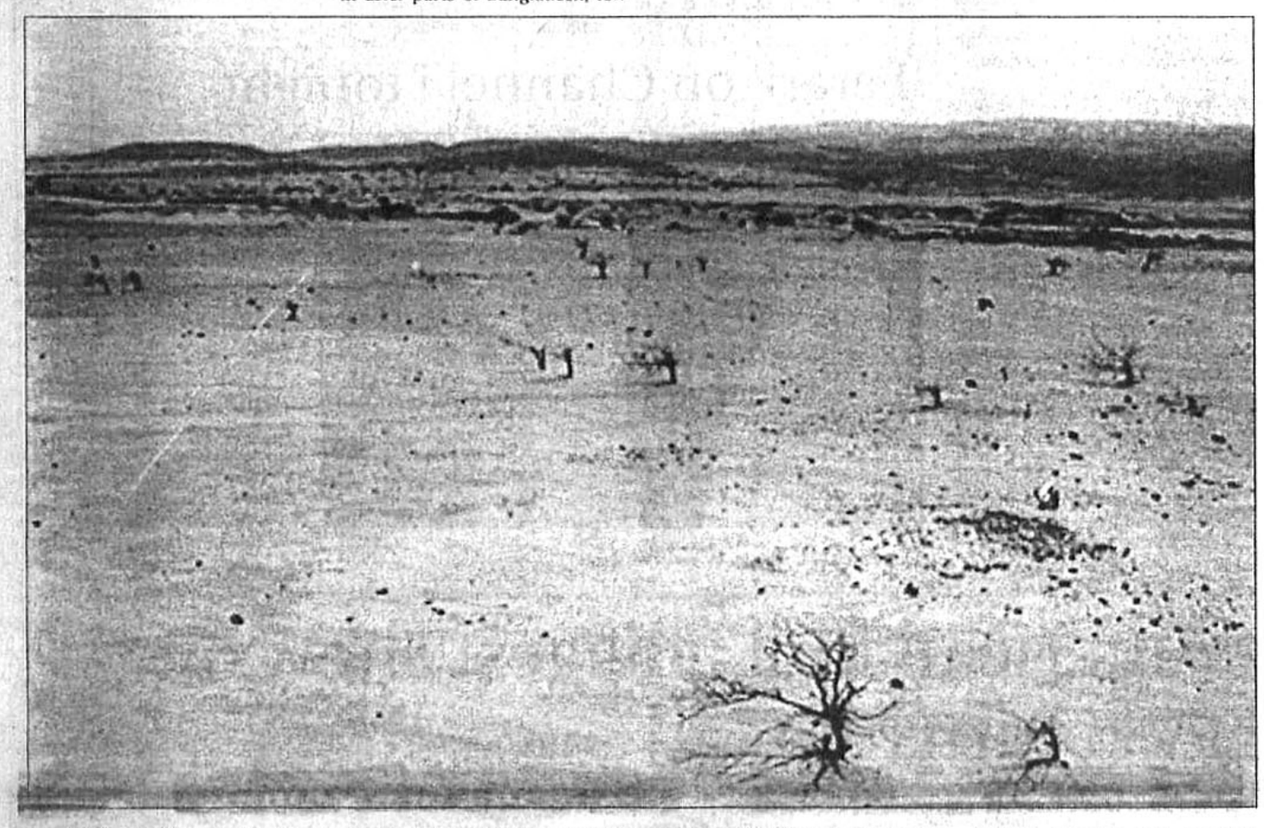
Desertification can feed on itself and become self-accelerating with devastating consequences for the environment and thus, for humans. Realising lethal consequences of desertification, international community expressed grave concern through declaring 2006 as the "International Year of Deserts and Desertification". Desertification is influenced by the multiplicity of causes, and an integrated approach is a must to combat it.



DESERTIFICATION is one of the world's most alarming processes of environmental degradation. In 1949, Aubreville, a botanist and ecologist first used desertification to mean changing of productive land into a desert-like wasteland as a result of man induced erosion. The definition adopted by the Rio Summit 1992 seems more precise that described desertification as the "land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors including climatic variations and human activities." Desertification moves forward to regions having yearly rainfall less than 25 cm and that very unevenly distributed.

World scenario

The United Nations proclamation of 2006 as the "International Year of Deserts and Desertification"



provided valuable opportunities for global communities to learn about and become more involved in dry land ecosystems and desertification issues. The World Environment Day theme for 2006 was "Deserts and Desertification" and the slogan "Don't Desert Dry Lands"! The slogan emphasised the importance of protecting dry lands, which cover more than 40 percent of the earth's land area, and 43 percent of the world's cultivated lands. This dry land ecosystem is home to one-third of the world's people mostly living in the developing countries, who are more vulnerable members of the society.

Globally land degradation causes an estimated loss of US$ 42 billion a year from agricultural production. Over the past 40 years, nearly one-third of the world's cropland has been abandoned as erosion made it unproductive. Each year an additional 20 million hectares of agricultural land either becomes too degraded for crop production, or becomes lost to urban sprawl. Over the last three decades the need for higher agricultural yield to feed the growing world population has exerted tremendous pressure on land and water resources. The growing need for agricultural land accounts for 60 to 80 percent of the world's deforestation. Desertification is found to various degrees on 30 percent of irrigated lands, 47 percent of rain-fed agricultural lands and 73 percent of rangelands. As the UN Millennium Ecosystem Assessment has highlighted, more than 60 percent of the world's ecosystems are in decline or even degraded to an extent that we can no longer rely on their services.

Bangladesh scenario

Of the environmental issues, desertification is the greatest challenge for Bangladesh. About 43 percent of the total geographical area is affected by various forms and degrees of degradation. In drier parts of Bangladesh, low soil fertility is recognised to be at the root of land degradation leading to desertification. The western-northwestern part of the country is considered as the drier region as total precipitation in the region is low. Land degradation due to aridity and loss of crops due to drought has caused considerable economic losses and human sufferings than any other problems in Bangladesh. Between 1960 and 1991, drought occurred nineteen times in Bangladesh. Past droughts have affected about 47 percent area of the country and 53 percent of the population. An analysis of the relative effects of flood and drought on rice production between 1969-70 and 1983-84 shows that drought is more devastating than flood.

Bangladesh is the largest delta on the earth created by alluvial deposits of the world's three large rivers -- the Ganges, the Brahmaputra and the Meghna. Despite receiving high total rainfall, the country is threatened by desertification. The process of desertification has been evident in different regions. About 53,760km2 area in the southern region has been affected by salinity hazards, increased urbanisation and industrialisation. In Madhupur tract, nearly 12,505km2 area is affected by over exploitation of vegetation resources and overgrazing and that in Barind tract, about 1,267 km2 area is degraded by improper utilisation of lands.

Bangladesh is not a desert, but overexploitation of its natural resources has gradually been converting this beautiful green land into an arid and environmentally catastrophic country. The UNDP's 1995 Report on Human Development in Bangladesh Environment identified that the growing population's demands, along with other related demands for 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 topsoil, creeping salinity, over extraction of ground water, indiscriminate land conversion, declining soil fertility, water logging and destruction of forests.

Impacts of desertification

Impacts on biodiversity: Generally desertification causes reduction in overall biodiversity where water availability acts as the single most important limiting factor for survival of biological entity and their growth as well. Desertification may increase in the proportion of foreign plants, and a decline in the variety of life forms and the ecological roles they play. Reduction in biodiversity causes lower productivity of an ecosystem.

Economic impacts: According to UNEP, 69 percent of the world's 5.2 billion hectares of agriculturally used dry land is degraded or subject to desertification, UNEP estimated that desertification costs the world US$ 42 billion a year. In Bangladesh there is particular dearth of information on economic impacts of desertification.

Socio-political impacts: The loss of soil fertility and vegetation cover and the decline in groundwater characterise desertification. This contributes to social and political tensions. Lower yield of crops or animals is likely to lead to famine, poverty and conflict. Desertification sometimes forces people to migrate from their lands, and lose their connection to the lands and cultures. Population displacement can create political problems, tension between neighbouring countries. Desertification stands at the root of persistent poverty for millions of people over the globe, and is considered as a great threat to world peace.

Health impacts: Infant mortality rate in dry lands is twice that the non-dry lands developing countries, and ten times that of developed countries. Dust storms are a growing problem in many areas, affecting the health of people and ecosystems near and far. Sand storms from the Gobi Desert affect much of China, Korea and Japan, causing increased incidences of fever, respiratory illnesses and sore eyes during the dry season. Wind-blown dust can cause allergies and mental stress.

Causes of desertification

Desertification is influenced by the multiplicity of causes, and can be grouped as -- (1) Natural causes: The natural causes of desertification are climatic condition and geological and geomorphologic setting. The climatic precondition for desertification are low and erratic rainfall, low humidity, high summer temperature, high degree of aridity, intense evapotranspiration, wind flow and high frequency of summer dust storms -- all that results in decreased natural vegetation cover. Geo-hydrological conditions, geographic position on the globe, inter alia, are also important contributing factors to desertification. (2) Anthropogenic causes: The anthropogenic causes are population pressure on natural resources for agriculture, housing and communication development, industrialisation, mining, etc. The growing need for agricultural land accounts for 60 to 80 percent of the world's deforestation. Mismanagement of resources has been the prime cause for desertification that is accelerating in many areas.

In developing counties, the immediate causes of desertification are overgrazing, felling of trees, water logging, salinisation and bad agricultural practices. Poor land management, such as overgrazing and cultivation of dry lands promote the phenomenon. If an irrigation system lacks a good drainage system, then the salt of the irrigation water accumulates in the soil. Eventually, the salt reaches the level toxic to most plants. The problem is now jeopardising about one-third of the world's irrigated land. Moreover, salt deposition in the soil might cause physiological dryness where plants suffer from unavailability of water before occurrence of actual drought. Salt deposition in Bangladesh's soil especially in the drier regions where agriculture increasingly depends on ground water irrigation needs an investigation.

Additionally, the following causes are accelerating desertification in Bangladesh. (1) **Man-Land ratio:** In the northwestern region (Rajshahi division), the ratio of cultivable land to rural population decreased to 23.2 percent compared to a decreased ratio of 17.2 percent in the whole country. So the geographer and ecologists claimed that there is evidence of desertification due to dry soil conditions in Barind tract. (2) **Upstream division/withdrawal of river water:** Diversion of the Ganges water by the Farakka Barrage in India has contributed to reduction of surface water availability and aggravated desertification process in the western part of Bangladesh. Journalist Hong in his article titled, "India's Irrigation, Bangladesh's Destruction" (Holiday, April 2, 2004) wrote "If waters of the Brahmaputra, Meghna, Teesta, Mohananda and other rivers are diverted by India following the implementation of its river interlinking project all Bangladesh's 230 rivers will die and the country will turn into desert". (3) **Cultivation system:** Soil degradation in the coastal areas results from unplanned land use, intrusion of saline water. Land degradation in Chittagong Hill Tracts is occurring mainly due to traditional shifting cultivation practices (Jhum), development of roadways and other physical infrastructures. Mono cropping, injudicious use of agrochemicals, lack of IPM system, etc. contribute to land degradation.

Countering desertification

Humans can play greater role in preventing desertification by removing/minimising anthropogenic causes. Preventing dry lands turning into desert includes activities that are aimed at: (i) Prevention and/or reduction of land degradation, (ii) Rehabilitation of partly degraded lands and (iii) Reclamation of deserted lands. The following policy actions could help prevent desertification:

* Building institutional capacity to conduct field level research for land degradation and applying the results to undertake appropriate preventive measures.

* Strengthening sub-regional, regional and international cooperation under UN Convention to Combat Desertification (UNCCD). This is especially important for Bangladesh as many large international rivers pass through it.

* Adoption of an integrated approach to address the physical, biological and socio-economic aspects of the desertification and drought.

* The existing laws on conservation of forest must be followed strictly. Projects should be designed to increase forest area. Inclusion of leguminous plants in the plantation programme will increase soil fertility through biological nitrogen fixation.

* Generally high population increases pressure on natural resources. In the developing countries like Bangladesh, increasing population inevitably lead to land degradation and declining crop yield. So population control activities should be intensified.

* Increasing surface water reserve, ensuring efficient use of surface water essentially necessary for prevention of desertification, efficient use of existing water resources and control of salanisation could be effective tools for improving arid lands.

* Education through agricultural extension can play a crucial role in preventing land degradation/desertification.

* Building awareness about desertification and its consequences.

* Research on reclamation of deserts focusing on cropping systems to protect the fragile soil through understanding plants (e.g. sand-fixing plants) adaptation to drier environments, understanding response of crops to desertification are essential for designing of cropping patterns for dry lands.

Management related activities: The following activities may help protect dry lands from desertification:

• Establishment of a permanent system at both national and international level for monitoring land degradation and desertification for improving living condition in the affected areas. To mitigate the effects of drought, national action programmes may also include establishment/strengthening of early warning systems and mechanisms for assisting environmentally displaced people. It is also necessary to strengthen drought preparedness and management including contingency plans.

• To keep soil live, industrial pollution is very important to avoid water and soil toxicity.

• In areas not yet affected or only slightly affected by desertification, it is necessary to manage existing natural formations (including forests) for conservation of biodiversity, watershed protection, sustainable agricultural development, and other purposes, with the full participation of indigenous people.

• To increase the vegetation cover and support management of biotic resources in regions affected or prone to desertification and drought, promote activities like aforestation/reforestation, agroforestry, community forestry and vegetation retention schemes.

• Promote improved land, water and crop management systems.

• Improve management of forest resources. Reduction of fuel wood consumption through efficient utilisation development and use of alternative sources of energy.

• Promote participatory management of natural resources to meet needs of both humans and conservation purposes, based on innovative or adapted indigenous technologies.

• Promote in situ protection and conservation of special ecological areas.

• Promote investment in forestry development in dry lands through various incentives including legislative measures.

• Include leguminous crops in crop cycle to restore soil fertility through biological nitrogen fixation and by reducing chemical fertiliser use. In the crop cycle, shallow rooted crop should follow deep-rooted crop.

• Artificial grooves/canals/ditches can be dug to retain rainwater.

• Wherever suitable windbreaks are made of trees and bushes, straw grids, tree fences, and grass belts to reduce soil erosion and evapotranspiration can be encouraged.

Using dry land ecosystem

An adaptation plan depending on ways and means of adaptation of biological entities, their rate of adaptation in context of the rate of desertification is urgently needed for dry land ecosystems. If properly cared and designed for cropping systems, dry lands can contribute significantly to economic growth by serving as a base for agro-industry, grazing, human habitation and activity rather than turning into deserts. There are many food and fodder crops, hydrocarbon plants, gums and resins producing plants, wax producing plants, timber plants, fuel plants that are suitable for dry land ecosystems. Deserts have many unique and endemic plant species that produce significant quantities of organic substances that are economically useful to people living in arid lands. A significant number of flowering plants, native and common to arid environments, synthesise a variety of organic substances that are suitable substitutes for petrochemicals.

Conclusion

Desertification can feed on itself and become self-accelerating with devastating consequences for the environment and thus, for humans. Realising lethal consequences of desertification, international community expressed grave concern through declaring 2006 as the "International Year of Deserts and Desertification".

Desertification is influenced by the multiplicity of causes, and an integrated approach is a must to combat it. Preventive measures should be introduced soon as preventing desertification is easier than to reverse it. Rational use of natural resources, and immediate adoption of appropriate management practices for agricultural and forest production are urgently needed to protect dry land ecosystems. Careful redesigning of production systems using suitable crop varieties for dry land ecosystems, providing people living in dry lands with non-farming jobs could help in addressing the problems. Delay may cause degradation to reach a threshold beyond which it is irreversible.

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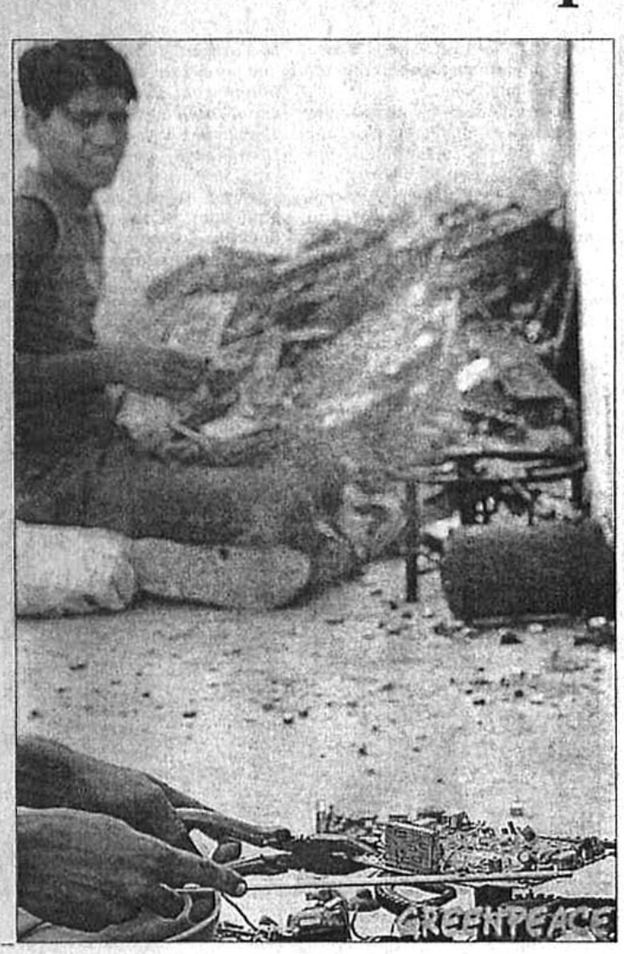
Electronics companies race to be greener



By turning the public spotlight on top electronics companies and challenging them to outrank their competition, the guide has succeeded in motivating many companies to improve their policies on chemicals and waste. But ultimately, companies only respond to issues that matter to their customers.

GREENPEACE INTERNATIONAL

ACER and Lenovo are the latest of the top computer makers to commit to stop using the worst toxic chemicals in their products. Along with Motorola these companies are the biggest movers in the latest version of our Guide to Greener Electronics. Disappointingly for Mac fans, Apple has dropped to last place.

We first released our "Guide to Greener Electronics" in August 2006. The guide ranks the 14 top manufacturers of personal computers and mobile phones according to their policies on toxic chemicals and recycling.

The public ranking has been successful in spurring many companies to improve, and the second edition, released today, shows good overall industry progress and some major individual improvements in rank.

"We are witnessing a global shift towards greener PCs, with Acer and Lenovo, two major producers, committing to eliminate the use of the most hazardous chemicals from their products range," said Iza Kruszewska, Greenpeace International toxics campaigner, "Most companies now score above average points on the ranking guide, with only five companies failing to score even the average of five points."

Green movers

Nokia continues to hold the top spot in the ranking, with progressive policies on both its chemicals policy as well as disposal of electronic waste. However, the company is yet to outline clear timelines for phasing out the toxic plastic PVC (vinyl) in all its products.

Motorola has been the fastest mover in the ranking guide. From second worst in the first version of the guide, it has made strong commitments to moved up to fourth place. Lenovo has also made strong policy commitments, to jump from the bottom to 8th place. Fujitsu-Siemens and Acer made substantial progress and are now ranked 3rd and 7th respectively, moving up from their earlier 10th and 12th positions.

Must do better

Apple has made no improvements in its policies and is now bottom of the ranking. While its arch rivals make progress, the world leader in innovation and design is falling further and further behind.

We'd expect an innovative company which takes pride in "thinking different" to be top of the ranking -- which was why we launched the Green my Apple campaign which has mobilized Mac fans worldwide to tell Apple how much they love their products: and how badly they want them to be environmentally sound.

LGE, Samsug and Sony have lost points for failing to act on their commitments to take responsibility for their waste; instead, the companies are supporting regulation in the US that would place the responsibility for product recycling on consumers instead of producers.

In September 2006, HP had one point deducted from its overall score when analysis of an HP laptop revealed the presence of a type of toxic chemical that HP claimed it no longer used. HP was quick to respond and investigate. They went public with an explanation on their website, and the penalty point was removed.

By turning the public spotlight on top electronics companies and challenging them to outrank their competition, the guide has succeeded in motivating many companies to improve their policies on chemicals and waste.

But ultimately, companies only respond to issues that matter to their customers. If you're a Mac or iPod user, join the growing ranks of Apple users telling Steve Jobs that the back of the pack is just no place for Apple.