

Desertification, global change and sustainable development

The Convention to Combat Desertification cannot be viewed in isolation from other efforts to promote sustainable development

The Convention text refers frequently to sustainable development, climate change, biological diversity, water resources, energy sources, food security, and socio-economic factors. The interactions between these issues and desertification are often not fully understood, but they are clearly important. The Convention therefore emphasizes the need to coordinate desertification-related activities with the research efforts and response strategies inspired by these other concerns.

Efforts to combat desertification complement efforts to protect biological diversity

While many people tend to identify the issue of biodiversity with tropical rain forests, dryland ecosystems also contain a rich biota, including plant and animal species not found elsewhere. Many of humanity's

most important food crops, such as barley and sorghum, are originated in drylands. Though disappearing fast, indigenous varieties remain a vital resource for plant breeders because of their resistance to stresses such as disease. Dryland species also provide drugs, resins, waxes, oils, and other commercial products. For example, drylands supply one third of the plant-derived drugs in the US. Finally, drylands provide critical habitats for wildlife, including large mammals and migratory birds. These habitats are particularly vulnerable to land degradation.

Land degradation affects the quantity and quality of freshwater supplies

Drought and desertification are associated with lower water levels in rivers, lakes, and aquifers. For example, unsustainable irrigation practices can dry the rivers that feed large lakes; the Aral Sea and Lake Chad have both seen their shorelines shrink dramatically in this way. Water crises are raising political tensions in many parts of the world, particularly where rivers and lakes are shared across borders. Land degradation is also

a leading source of land-based pollution for the oceans, as polluted sediment and water washes down major rivers.

Natural climate variations can strongly affect drought patterns

Currently the best understood link between global climate variability and drought involves sea-surface temperature patterns. Research into such climate patterns is starting to improve seasonal rainfall predictions. Efforts to strengthen predictions are an important part of national action programmes to combat desertification and will help dryland farmers and herders to prepare better for droughts. **Desertification also impacts upon the climate, with land degradation and related loss of vegetation leading to increased emissions and reduced carbon sink.** Restoration of dryland conditions could therefore have a major impact on global climate patterns.

Climate change and desertification

Climate change is a major contributing factor to desertification. An increase in



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weather extremes such as droughts and heavy rains as a result of global warming will lead to further land degradation. This in turn will exacerbate the ongoing problems of poverty, forced migration and conflicts. While desertification is already responsible for significant forced migration, more than a billion people - one in seven of the current world population - could be forced from their homes between now and 2050 if climate change worsens.

Desertification may temporarily affect climate change

Land degradation tends to reduce surface moisture. Because less water is available for the sun's energy to evaporate, more energy is left over for warming the ground and, as a result, the lower atmosphere. Meanwhile, wind erosion in drylands releases dust

and other particulates into the atmosphere. By absorbing the sun's rays or reflecting them back out into space, they may help to cool the Earth's surface. However, the energy they absorb can heat the lower atmosphere and in this way reduce temperature differences between the atmosphere's vertical layers; this can lead to fewer rain-showers and thus drier land. Finally, the periodic burning of arid and semi-arid grasslands, often associated with unsustainable slash-and-burn agriculture, emits greenhouse gases. So does the unsustainable use of fuel-wood and charcoal, a major cause of land degradation. On the other hand, reforestation is likely to have a cooling effect and is also, of course, an important way to combat land degradation.

A common approach to tackling desertification and climate change will have multiple advantages

It particularly benefits the poor in the world's drylands who struggle to secure a livelihood from the land and who are suffering most from the double blow of desertification and climate change.

Desertification exacerbates poverty and political instability

It contributes significantly to water scarcity, food crisis, and internal displacement of people, mass migration, and social breakdown. This is a recipe for political instability, for tensions between neighboring countries, and even for armed conflict. Evidence is mounting that there is often a strong correlation between civil strife and conflict on the one hand and environmental factors such as desertification on the other.

