



Combating Desertification through Science

When the mass media draw world attention to scenes of famine and starvation or to ethnic conflict and political turmoil, drylands, with startling frequency, provide the backdrop.

What generally escapes our notice in these scenes is the less dramatic, but no less destructive, phenomenon called desertification. It is a widespread predicament in drylands, which cover 40 percent of the earth's surface and are home to more than 2 billion people, or about a third of the earth's total population. And it contributes significantly to the human suffering so often witnessed in dry areas. Halting desertification ranks among our most urgent human and environmental challenges.

Desertification — an especially severe form of land degradation — is a complex phenomenon and does not easily lend itself to a simple, universally valid definition. The perspective of a dryland pastoralist, for example, may differ from that of a national policy maker. Nonetheless, desertification may be described as a persistent, long-term decline in agricultural productivity, soil fertility, biodiversity, and water — upon which human livelihoods depend.

The causes of desertification are many, and they vary with time and location. Prominent among them are climatic conditions, especially drought. But social realities, such as rapid population growth; and economic factors, including market prices for agricultural products, also play a role. In addition, policies on a wide range of issues — from land tenure and infrastructure to tariff barriers and agricultural development strategies — exert a strong influence. The cumulative result of these factors is that rural people fall into patterns of land use, such as overgrazing of livestock and deforestation, which lead to a downward spiral of land degradation and worsening poverty.

Who are the people caught in this global trap, and how are their lives affected? Prominent among them are millions of small farmers practicing semi-subsistence agriculture. To a large extent, these people

are the stewards of fragile drylands, and their decisions about land management can either accelerate or reverse desertification. Large-scale commercial growers and livestock producers also figure importantly in dryland agriculture, and arguably their activities contribute more to desertification than does small-scale farming.

By practically any measure of human well-being, dryland populations are worse off than those inhabiting other ecosystems, such as humid tropical forests. The semi-arid tropics contain 45 percent of the world's hungry and 70 percent of its malnourished children. The infant mortality rate, which averages about 54 per 1,000 for all drylands in developing countries, exceeds that for non-drylands by 23 percent or more. This is a telling indicator of other forms of deprivation in dry areas, such as limited access to clean drinking water and inadequate sanitation.

Desertification occurs on all continents except Antarctica. Globally, an estimated 10–20 percent of drylands is already degraded. The problem is especially severe in Sub-Saharan Africa, Asia and Latin America. But its multiple consequences are not limited to specific groups of poor people living in developing countries. Dust from African and Asian drylands has been associated with respiratory problems as far away as North America.

Other consequences of desertification can be equally far-reaching. Many inhabitants of drylands leave them in the hope of finding an exit from poverty. While improving the situation of some families and individuals, massive migration leads to the overall worsening of such problems as urban sprawl and conflict over scarce resources. And those conditions, in turn, may contribute to ethnic strife and political turmoil.

Virtually everyone is touched by the consequences of desertification and has a stake in turning it back. As a first step, we must set aside the misleading images, with which we are constantly fed, of helpless rural people, wandering across desolate landscapes. Far from being mere victims, or even partly to blame for their plight, small farmers in drylands are central to the search for solutions. Much of the knowledge needed to contain desertification resides in their individual and collective experience. As resilient and adaptable land managers, they hold one of the keys to achieving more robust livelihoods in these vast and starkly beautiful landscapes.

Yet, in putting their knowledge and skills to better use, dryland farmers can benefit from science — another key to successfully combating desertification. The Consultative Group on International Agricultural Research (CGIAR) and its national partners deliver significant scientific support. For more than 35 years, researchers from these organizations have harnessed global knowledge — both from local experience and formal science — in the fight to reduce desertification and its negative impacts on human well-being and the environment.

Experience suggests that an integrated agroecosystem approach is the most effective for achieving these ends. And it is the approach advocated by the United Nations Convention on Biological Diversity (CBD) as well as the Convention to Combat Desertification (UNCCD), which has been signed by 179 countries (www.unccd.org). An integrated approach addresses both the agricultural and natural resource sides of dryland development, as well as the complex interactions between them, and it strongly emphasizes farmer participation in research.

In pursuing such an approach, CGIAR scientists channel their efforts toward the development of improved crop varieties suited to harsh dryland climates; practices that make more prudent use of soil, water and other natural resources; and policy recommendations that help create more favorable conditions to cope with the challenges posed by desertification. These products are international public goods, which can be shared widely across national boundaries and adapted to diverse dryland settings.

In the International Year of Deserts and Desertification, the CGIAR has decided to create a new cross-Center program that will link all of its research for dryland development. Called Oasis, the program takes the optimistic view that, through more concerted efforts, desertification can be contained.

