

DESERTIFICATION

A United Nations conference examines the causes and effects of the continued spread of desert lands and produces a global plan of action aimed at achieving zero desert growth

BY CAROL L. ROGERS

Deserts . . . The word evokes images of vast stretches of barren lands—the Sahara and Kalahari in Africa, the Gobi in Asia, the Sonoran in Mexico and the United States. Much of the earth that is considered desert today was once fertile, productive land and has become desert since the dawn of civilization.

The creation of deserts or desert-like conditions is termed desertification. Generally thought of as the degradation of lands by natural and human means, desertification results in the diminution or destruction of the land's biological productivity. The process of desertification is at least as old as civilization but only recently has it been recognized as a serious global problem. What focused international attention on it were the devastating effects of the six-year drought in the Sahel, the southern margin of the Sahara, encompassing Mauritania, Senegal, Mali, Upper Volta, Niger and Chad.

Drought is not new to the Sahel. The area experienced droughts in 1911 and again in 1940. However, modern communication—especially television—brought home to millions of persons around the world the tragedy that accompanied this most recent disaster that began in 1968. Pictures of vast migrations and refugee camps, starving people with hollow eyes and matchstick limbs, and dead and decaying animals flashed across the screen nightly. Estimates of death in the Sahel during the period of the drought ranged between 100,000 and 250,000 persons, while the amount of drought-induced disease was impossible to calculate. Livestock losses were high—in the worst areas, they were said to have exceeded 90 percent.

Favorable rains returned to the Sahel in 1974, ending the drought. Its legacy remains, however, in the intensification of desert-like conditions in the Sahel region. The worst effect might be the permanent loss of the land's biological productivity if dramatic steps are not

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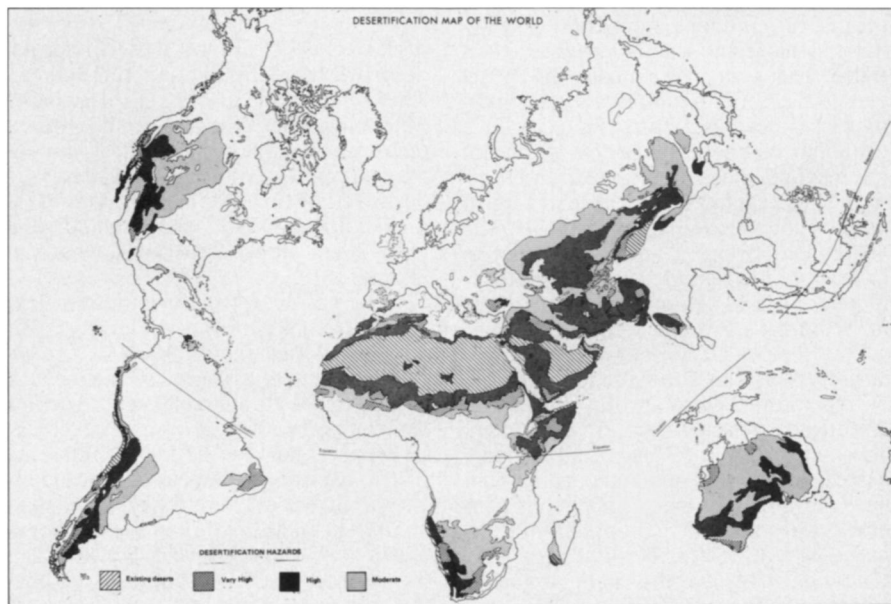
The six-year drought in the Sahel focused attention on the problem of desertification.

taken to reverse its deterioration.

The Sahel experience is only the most vivid recent example of desertification and its consequences. Actually, more than one-third of the earth's land surface is desert or semi-desert. Half the nations of the world have part or all of their territory in arid or semi-arid zones most susceptible to desertification. This land, which currently supports approximately 14 percent of the world's population, is gradually losing its productive capacity. While estimates vary, some scientists predict that one-third of the world's arable lands will be lost to desertification during the next 25 years unless the process can be slowed. During roughly the same time period, the world's demand for food is expected to increase by at least one-third.

Growing awareness of the magnitude of the problem of desertification and the need to mount a concerted global attack to combat it led the United Nations to convene an international conference on the topic. The latest in a series of meetings on environmental issues, the UN Conference on Desertification, was held in Nairobi, Kenya, at the end of this summer. Approximately 700 official delegates from 100 countries and several intergovernmental and nongovernmental organizations attended the meeting at the Kenyatta Conference Center.

After two weeks of intense deliberations, the delegates approved an ambitious 90-page plan of action designed "to achieve zero desertification growth by the year 2000." The 26 principal recommendations in the plan cover a wide



assortment of activities to be undertaken at national, regional and international levels. They include such matters as assessment of the problem, measures against drought, climatological research, improvement of land management, public participation and indigenous science and technology. While the plan provides a useful catalog of desirable actions, it fails to establish any priorities for these actions, leaving this important function to individual countries. Many scientists viewed the failure to set priorities as one of the plan's major weaknesses.

In assessing the causes and effects of desertification, the plan points out that "important factors in contemporary society—the struggle for development, population growth and demographic change, the effort to increase food production and modern unadapted technologies—interlock in a network of cause and effect." Although it acknowledges the role of natural occurrences, such as climatic changes, it considers the actions of humans as being the most critical. Of 45 identified causes of desertification, only 13 percent are due to natural changes; 87 percent can be traced directly to human mismanagement. Chief causes are overgrazing, overcultivation, cutting trees for firewood and destructive irrigation practices, with overgrazing being perhaps the biggest problem of all.

Microbiologist Mostafa Tolba, secretary-general of the UN conference and executive director of the UN Environment Program, has observed that "desertification is seen to result from the action of man—which means the problem can be solved." Inherent in this situation is a basic dilemma, as Jack Johnson, director of the Office of Arid

alternatives," Johnson adds.

Recognition of these human aspects of desertification is woven throughout the UN's plan of action. Countries are urged to ensure that all measures they undertake to combat desertification are directed primarily at improving the well-being of the peoples they affect. In addition, the plan calls attention to the unique experiences, knowledge and skills of inhabitants of desert-prone areas and stresses that they should be fully utilized in any anti-desertification programs. The experience of nomads in combating desertification and adapting to desert conditions was believed to serve as a good basis for anti-desertification activities.

One main theme of the plan is that existing knowledge is sufficient to begin combating desertification and that some programs should be undertaken right away. As Tolba notes, the plan recognizes the "need for immediate action in applying existing knowledge—not only to stop the physical processes of desertification—but to educate people in minimizing the harm done to fragile ecosystems of arid and semi-arid areas by present social and economic activities."

The delegates also found some important gaps in what is known about desertification processes and called for some additional research, both basic and applied, to be conducted. Climate was singled out as an area to be given particular attention because of the lack of understanding that still exists about the cause and effect between climate, human actions and desertification. The plan stops short of making any specific recommendations for studies. Instead, it asks for UN General Assembly endorsement of several current and planned activities that are designed to provide more data on the impact of climatic variations on the natural environment and human activities, specifically the World Climate Program, the World Climate Conference scheduled for 1979 in Geneva, and the Global Atmospheric Research Program.

Other topics mentioned in the plan as needing research attention are water harvesting (especially using local traditional technology), use of brackish water, water desalinization, rainfall prediction, water-crop relationships and the impact of the introduction of modern technology on traditional systems of land use. In addition, delegates called for the development of inexpensive and socially acceptable alternative or unconventional energy sources in drylands to serve the needs of the people.

Throughout, the plan calls for a national or transnational system of survey and monitoring to assemble information on resources and human populations and on the dynamics of desertification. The need to monitor both the long-term effects of desertification on human well-being and those aspects of human behavior that might contribute to desertification are stressed, but only with the full consent of the countries concerned.

The plan assumes the need for ground-based, air and satellite observations. The heavy emphasis on monitoring indicates the necessity of being selective in the choice of criteria used, since indiscriminate monitoring would not only be costly but would also provide much information of little utility. Therefore, identification of critical indicators of desertification was seen by the delegates as a research need of the highest priority.

While the conference itself neglected to identify these, about 30 international scientists gathered in Nairobi im-



Tolba, secretary-general of the UN conference: "The problem can be solved."

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Land Studies at the University of Arizona and a member of the U.S. delegation to the conference, points out. "The reality is that Man is fouling up the land with the way he is using it. But he has to have an alternative. For example, the answer to the problem of overgrazing is simply to reduce the number of animals in a given area. However, you can't do that without providing people with other sources of income and food. The goal of any program to combat desertification has to be to provide such



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Overgrazing is a major part of the problem. Pastures turn to wasteland.



UN/FAO

mediately preceding the UN conference did reach a consensus on an integrated set of critical indicators that can be used to monitor the progress of desertification and of anti-desertification efforts. The scientists, brought together under the auspices of the American Association for the Advancement of Science and five similar associations in East Africa, France, India, Latin America and the United Kingdom, divided the agreed-upon indicators into three general categories: physical (such as degree of salinization and alkalization of the soil, depth to ground water, number of dust storms and presence of soil crusts); biological/agricultural (including canopy cover, herd composition, populations of domestic animals and yield); and social or human well-being (among them land

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use, settlement pattern, population structure and rates, migration, conflict and cash vs. subsistence agriculture). After being refined during field testing in several anti-desertification projects, the set of indicators is expected to be beneficial in the implementation of the plan of action, according to Priscilla Reining of the AAAS, seminar coordinator and member of the U.S. delegation.

One of the most tangible products of the UN conference will probably be six "transnational" or cooperative inter-governmental experimental projects, involving 29 countries, that have been developed to halt desertification and to demonstrate how countries can work together to solve common problems.

These projects include establishment of "green belts" in the northern and southern fringes of the Sahara, to extend from the Atlantic Ocean to the Red Sea, to limit grazing and allow regeneration of some of the region's lost farming land. They also include management of groundwater resources in northeast Africa and the Arabian Peninsula, management of livestock and rangelands in the Sudano-Sahelian regions and monitoring of desertification processes and related natural resources in south-west Asia and South America.

As might have been expected, one of the major issues on the final day of the conference was how to finance the anti-desertification efforts outlined in the plan of action. The conference called for the creation of a special account that would draw its resources from member states, international taxation, donations, multilateral financing institutions and interest-free loans. It also called for a study of other ways of financing the plan, such as holding funds in trust and having an international fund. In addition, the conference delegates approved the immediate establishment of a permanent consultative group of "highly qualified experts" to assist in coordination of anti-desertification activities.

Financing may continue to be a major problem in implementation of the plan. The United States, the United Kingdom and several western European and Warsaw Pact countries announced that they did not approve of the creation of a special account and doubted that it would raise any new money. The United Kingdom specifically said it would not contribute to such a fund. While the United States stopped short of such a statement, it is highly questionable whether the United States will contribute to it either.

There also is no agreement on what the exact cost of anti-desertification efforts might be. The UN had suggested that an annual investment of \$400 million in such programs would return handsome dividends. However, some experts consider that figure unrealistically low. And, since desertification is a self-accelerating process, delay in taking action to combat it can cause rehabilitation costs to rise exponentially.

The measure of the success of any conference has to be whether it accomplishes what it sets out to do. Under Secretary of the Interior James A. Joseph, who chaired the U.S. delegation, gives the conference high marks in this regard. He points out that the conference had three major objectives, all of which were met: to assess causes and effects of desertification, to approve a world map of desertification and to adopt a global plan of action. In addition, he stresses the value of having people who deal with such problems at a national level come together to share their experiences and insights.

The final vote on the success of the conference has yet to be cast, however. It remains to be seen whether countries around the world have the political will and determination to mount the major long-term battle necessary to halt the spread of deserts. As Joseph pointed out in his address to the conference, "The long-term social, economic and political consequences of failure to solve ... [problems of desertification] are enormous." □

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