

# Desertification

## in the Third Millennium



Edited by

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# Preface

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The Desertification Conference entitled “Toward Better Management of Arid and Semi-Arid Lands in the Twenty-First Century” was convened in Dubai, UAE, during 12-16 February 2000, under the auspices of the Zayed International Prize for the Environment. This volume contains a representative selection of 53 of the original 125 oral presentations at the conference, which contributed to the following objectives:

- to enhance our understanding of local, regional, and global short and long-term environmental changes;
- to convey best practices associated with the ecological management of arid areas; and
- to improve our general understanding of desert environments as we are approaching the third millennium.

The papers are distributed among the following themes:

1. Desertification and global climatic change
2. Biodiversity in mangrove and halophyte ecosystems
3. The effect of wind and water on soil erosion and sand creep
4. Land degradation and management in arid, semi-arid, and dry sub-humid areas
5. Policies and cost/benefits for combating land degradation and desertification
6. Application of remote sensing and Geographic Information System (GIS) to desertification studies
7. Groundwater resources in desert areas

Desertification is land degradation in dry land environments resulting from such factors as climatic variation and human activities. It is the outcome of the interactions between human land-use practices and a dynamic, uncertain environment. If global warming predictions are realized, the environments of desert areas and their margins are likely to be profoundly affected. Global warming may lead to changes in soil moisture availability following changes in both precipitation and evapotranspiration rates caused by the temperature rise itself. The global climate is ever changing, however, global warming does not result in every point on the surface of the earth experiencing an increase in surface temperature. There is a need to study climate on local spatial scales in order to understand its variability in time. This change is an integrated effect of natural climate variability and human-induced changes. Protection and habitat preservation initiatives offer the best solutions for biodiversity conservation in the face of desertification and loss of rangelands to agriculture. Both dryland and wetland reserves have provides effective protection for rare, endangered, and endemic species. Mangroves are one of the dominant features of the shores of tropical countries. Ecologically, they have been considered an important component of coastal ecosystems. Biodiversity and the mangrove ecosystem are closely related to diversity of coastal bio-climatic, geological and sociological conditions; frequency of inundation; circulation pattern; and water quality of coastal areas. Land degradation, desertification, and deforestation are considered to be major environmental problems in many countries of the world. The major causes for desertification were recognized as natural environmental factors and manmade causes. Unsustainable irrigation practices, overgrazing, uncontrolled cultivation, wood-gathering for fuel, salinization, and water logging are cited as the main activities that contribute to the degradation of land area in the region.

The Dubai International Conference on Desertification has focused on an issue that affects most of the world’s population, directly or indirectly. It is of paramount importance in the Middle East, Africa, Asia, Australia, and America and is closely tied to the vicious cycle of poverty and environmental deterioration.

The Zayed International Prize for the Environment fully sponsored and organized this conference. This Prize is a non-profit organization aiming to promote and encourage outstanding and pioneering environmental achievements in line with the environment and development vision and philosophy of the dedicated environmentalist, **H.H. Sheikh Zayed Bin Sultan Al Nahyan**, President of the United Arab Emirates.

Founded by **General H.H. Sheikh Mohamed Bin Rashid Al Maktoum**, Crown Prince of Dubai and UAE Defense Minister, the Zayed International Prize for the Environment, is more than a prize - it is a foundation which endeavors to promote sustainable development through various environmental initiatives. In addition to

administering the prestigious Prize of one million dollars, this foundation also organizes regional and international conferences and forums on specific environmental issues; publishes a magazine, a book series, and a newsletter; and helps raise environmental awareness through public lectures, training seminars, workshops, and the development of relevant information materials.

The Zayed Prize for the Environment will be awarded to individuals and organizations that have:

- successfully solved a specific environmental problem;
- advanced the cause of the environment toward sustainable development;
- brought to public notice significant environmental issues or mobilized action toward their solution;
- contributed significantly to intellectual, scientific, or theoretical approaches to environmental concerns; and/or
- undertaken activities and initiatives which can serve as a model to others.

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