

## Foreword

The Arabian Peninsula constitutes one of the largest contiguous arid zones in the world. Within this context of aridity the region is surprisingly diverse in climatic conditions, soil types, landscapes, and land use patterns. Agroecological niches occur with edaphic conditions that can deviate substantially from those of surrounding areas and often have a higher biomass or agricultural productivity. In the context of global climate change this agroecological diversity is also an important source of abiotic stress resistance in plants against drought, high temperatures, and salinity.

However, the region is also ecologically fragile. Firstly, it is vulnerable to natural processes, such as primary salinization, and wind and water erosion. In addition, overgrazing, fuel-wood extraction, drought, and depletion of fossil water resources are increasingly threatening the sustainability of the natural resource base, and may lead to potentially irreversible desertification.

A rational approach to combating desertification requires in the first place differentiating true degradation, as a result of over-exploitation, from processes and conditions that are the natural outcome of the biophysical limits imposed by the harsh climates that prevail in the Arabian Peninsula. Such an approach necessitates the development of agroecological frameworks, which allow assessing the spatial and temporal variations in the natural resource base and associated land use systems.

To combat desertification effectively, a good agroecological characterization is of vital importance. Numerous thematic surveys in the form of soil survey reports, climatic maps, and groundwater surveys already exist in the Arabian Peninsula. However, the challenge is to develop integrated land and water resource information systems, based on GIS-technology. This integration will allow linkage of multidisciplinary, geographically referenced databases at different resolutions, and to develop decision-support systems for more sustainable land use management and resource use regulations.

By bringing together information sources from the international public domain and the Arabian Peninsula itself, and processing them with state-of-the-art GIS technology, this report aims to initiate this process of data integration at the regional level. As such it will be of value for agricultural research planning, biodiversity management, land use planning, and public awareness at the national and regional level. We hope it will fill a major gap in our understanding of the agroecological diversity, vulnerability, and agricultural productivity of one of the most important arid regions in the world.



Prof. Dr Adel El-Beltagy  
Director General, ICARDA