

# Preface

This is a book about the reclamation of arid lands. Arid lands can be defined as regions where evaporation exceeds precipitation. Harsh ecological conditions, especially rainfall deficiency, limit life in these areas. At first glance, it seems that without enough precipitation, reclamation and restoration of these areas is not possible. But there are new techniques which, together with indigenous knowledge, enable us to establish plants with low precipitation. The authors' observations and findings in arid areas of Iran, especially central parts of the country, demonstrate that the people of these areas have been adapting themselves to difficult conditions for many centuries. This means that indigenous knowledge of these areas is of high benefit for reclamation.

Successful reclamation of arid land requires various important and effective agents, but water, soil and plants are the most significant. Hence, this book is mainly structured on these three elements.

Soil reformation techniques for planting purposes with a look at some applied examples are presented in Chap. 2.

Different methods and techniques of water saving and harvesting in arid and semi-arid regions are presented in Chap. 3 of this book. Some of them are based on modern technology, while the rest refer to indigenous knowledge of water resources management in arid areas of Iran and could be used in similar areas of other countries, especially in the Middle East. For instance, the *qanat*, a masterwork of ancient Iranians in arid areas of the country, is explained. Water resources in arid lands are scarce and are mainly underground water. *Qanat* is an old system of water supply from a deep well with a series of vertical access shafts. Two *qanat* locations have become important tourist destinations and are now World Heritage Sites.

How to reform saline and alkaline soils are the subjects that are important and guide us toward a successful reclamation which is mentioned in Chap. 4.

In Chap. 5, wind erosion, stabilization of sand dunes and various plants, especially those which are adaptable to harsh conditions and are able to be established in arid and saline areas, are introduced. Their vegetative properties, habitat conditions and methods of planting are described. These plants include the best-known halophytes, hydro-halophytes and psammophytes of arid environments.

In the final chapter (Chap. 6), different aspects of the potential of arid lands, including ecotourism, geotourism, biodiversity, rural societies, sun and wind energy and extractive industries are summarized.

Overall, this book provides an overview of arid and semi-arid land conditions, their general characteristics, methods of management, conservation, exploitation and reclamation. It also focuses on how to utilize the potential of arid lands with the minimum manipulation and alteration. Arid and semi-arid areas represent a major part of natural ecosystems not only in Iran, but also around the world, and mismanagement and inappropriate exploitation of these areas may lead to further gradual degradation. Understanding the characteristics of these areas is vital if they are to be conserved and reclaimed.

Although there are many valuable books about deserts, desertification, arid lands and land degradation, the authors believe that this book includes valuable applied information about arid and semiarid regions for specialists and non-experts alike, and introduces simple methods of arid land reclamation that are based on both modern and indigenous knowledge. We hope that what is presented in this book can be exploited by managers and specialists for reclamation of arid lands in different countries.

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