

ARIDITY: DROUGHTS AND HUMAN DEVELOPMENT by Monique Mainguet, Berlin: Springer, 1999.

For European laymen and scientists, deserts were always mysterious and dangerous lands that very few dared to explore. Deserts were associated with menace, nomadism, drought, famine, dust and sand storms initiated by strong winds. Monique Mainguet is among the few physical geographers whose life work has been dedicated to studying the physical properties of deserts. In a sense, *Aridity: Droughts and Human Development* is a retrospective of her many years of research. The summary of her desert studies, however, cannot serve as a simple textbook on arid lands.

The aim of the book, as presented by the author in the Preface, is to illustrate the primordial importance of the 'environmental' factor in development, and the necessity of taking it into account more than other factors of the ecosystem. This deterministic approach is illustrated by what the author calls 'geohistory,' or the consideration of the geographical environment before looking at the historic situation.

The author starts the book with eleven questions that are still being debated and concern the main issues related to deserts. Most of these questions, dealing with aridity, drought, and arid ecosystems, have been asked since the 1970s when the issue of desertification first came up.

Many books have been written about the physical geography of deserts. This book, however, presents a different approach, which brings man, aridity and drought into one context. Although the author is a physical geographer, she has attempted in her book to integrate the environmental sciences and human geographical processes. This is the way many classical geographers would like to see the discipline of geography. Unfortunately, however, the treatment of human processes does not sufficiently delve into the essential issues. In many cases, questions are raised about basic human issues without reaching any substantial conclusions. For example, were the wars and conflicts in the Middle East the sole result of water scarcity?

The book has four chapters. Chapter One deals with the concepts of aridity and drought in connection with soils and vegetation. According to the author, drylands have been the cradle of modern civilization. The challenge of maintaining human life in deserts has inspired the invention of many agricultural techniques. Drylands in the 20th century, however, are deteriorating, due to environmental degradation and economic decline. When dealing with the five desert types of the world, the author discusses the continental deserts in far greater detail than the other types, taking the Turan Desert as a prototype. The treatment of desert soils is also somewhat exaggerated.

The author identifies deserts by aridity and drought. Aridity implies lack of water, high sun insolation, high temperatures, low air humidity, and high potential evapotranspiration. It is difficult to agree with the author's distinction between *aridity* and *drought*, although at a later point she says that both terms are related. The two phenomena are clearly linked, especially meteorological drought, as shown

in Fig. 2.1. The author uses several parameters for defining aridity. She classifies aridity by using average rainfall and its variability, but ignores the effect of temperature as reflected in the average potential evaporation. It would have been better to avoid the use of definitions that have not been accepted by many scientists, such as the FAO-Sida mission subdivision for north equatorial Africa that is based only on the amount of precipitation. Edaphic drought as described by the author seems to be a synonym for desertification. Later when postglacial aridification is dealt with, the concept of desertification does appear, but the author reaches the commonly accepted conclusion that the Sahara desert is not conquering the Sahel. The author deals with the question of the last aridification in the Sahel, presenting two hypotheses about it: one, that there is a trend of growing desiccation, and two, that it is part of the fluctuation in weather characteristic of deserts. The author repeats the most important question that has been asked by many environmental scientists: Do the last 30 years of drought in Africa represent a mere fluctuation, or are they a manifestation of a progressive aridification? The author tends to support the first assumption. She also asks a second important question: are the results of drought irreversible? The book raises many of the very controversial issues of arid land management, desertification, and the effect of possible climatic change on the aridification of the world. Because of their complexity, however, it is most likely that these disputed matters will remain unsolvable.

Chapter Two is mostly a textbook of geomorphology, whereas it would have been better to focus only on the hydrological and aeolian constraints of arid lands. The author does not deal, for example, with factors affecting mobilization and stabilization of sand dunes and their interrelation with aeolian processes. This chapter reflects the author's point of view on aeolian processes, an approach that is not always accepted by others.

Chapter Three, the most interesting part of the book, treats the ways human beings have adapted their lives to the constraints imposed by drylands. Most of the chapter describes techniques used by the desert inhabitants to compensate for the scarcity of water. The detailed discussion of the development of irrigation, as part of the human response to hydrological constraints, is engaging, but unfortunately the section dealing with human response to aeolian constraints is relatively limited. The chapter also describes the impacts the modern era has had on land use, and modern processes and consequences of sedentarization. However, some inaccuracies raise the reader's doubts about certain facts presented in this chapter. Lake Lisan (not Nissan as misspelled on p. 155), that preceded the Dead Sea, disappeared during the last glacial maximum, which was a drier period. The lake shrank when the climate became hotter, between 13,000 and 11,000 years B.P., as discussed by Yechieli *et al.* (1993).

Chapter Four deals with the impact of human activities on arid zones, as described in the former chapter, and the resulting deterioration of deserts. The general term for these processes is *desertification*, which is in itself a disputable term. The fifth section of this chapter deals explicitly with desertification, and, as expected, the

subsections raise various questions. Some myths have been associated with the term desertification, and the author explodes the myth that deserts are 'on the march'. Unlike politicians, the author and many other scientists focus on the degradation of semi-arid areas (the steppes) and not on the advance of the desert.

While this book, which has been translated from French, somewhat awkwardly retains French terms not commonly used by English-speaking scientists, such as *pluviometry* for rain or *edifice* for a dune structure, its great contribution lies in the window it opens to the rich French literature about deserts. Many scholars of deserts, including the author of this review, are not fluent in French and are not familiar with the vast French literature on the subject. Mainguet's book, therefore, is noteworthy in bringing the very significant French thinking on these issues to a wider public. More careful editing would have ascertained that all sources cited in the book are listed in the reference section, and appear with correct and consistent spelling there and in the text.

#### REFERENCE

- Yechieli, Y., Magaritz, M., Levy, Y., Weber, U., Kafri, U., Woelfli, W., and Bonani, G. (1993) Late Quaternary geological history of the Dead Sea area, Israel. *Quaternary Research*, 39:59–67.

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