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0521820650 - Soils, Land and Food: Managing the Land during the Twenty-First Century

Alan Wild

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Soils, Land and Food

Managing the land during the twenty-first century

A major challenge of the twenty-first century will be to ensure sufficient global food production to cope with the burgeoning world population. *Soils, Land and Food* is a short text aimed at undergraduates, graduates, agricultural scientists and policy makers which describes how the use of technology in soil management can increase and sustain agricultural production. The book leads the reader through the development of techniques of land management and discusses reasons why some agricultural projects have succeeded while others have failed. It shows how surveying and protecting soils before new land is brought into cultivation, raising soil fertility, increasing inputs and improving economic conditions can all help to increase food production. Particular emphasis is placed on the need for both economic change and technological innovation in developing countries where, in many cases, food production will need to more than double in the next 50 years.

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Preface

During the twenty-first century one of the greatest challenges for mankind will be to ensure that the production of food is sufficient to meet the demand of an extra two billion people by 2025 and three billion by 2050. Most of this increase in demand will be in countries of the developing world. If those living on the edge of starvation are to be better fed the increase will need to be bigger than the increase in population: a doubling of global food production may be required by the middle of the century.

From the early days of agriculture more land was brought into cultivation as populations increased (cause and effect are intertwined). Farming systems adapted to the local environment evolved from hunting and gathering economies. New crops and domesticated animals were introduced from other regions, more land was cultivated and new techniques were developed. There was success but also failure as some soils lost their fertility by nutrient mining and, more dramatically, by erosion. Although most people in the world have an adequate diet, whether we can meet the demand for food and still retain our prime ecosystems is a question for the future.

The underlying theme throughout this book is the standard of land and soil management, soil being essentially a non-renewable resource. The key player is the farmer, who will use good management skills if he has security of land tenure. He will increase output if he has incentive to make more profit, which depends on there being people with money to buy his produce. The required economic and social conditions are referred to in this book but are not discussed in detail. The other arm of development, which is more fully discussed here, is the use of technologies that can increase and sustain agricultural output.

It has been said that to understand ourselves we need to know our history. This applies with equal force to our understanding of

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land management. For this reason, following definitions of terms in Chapter 1 and a description of natural resources in Chapter 2, an overview of the development of land management since the start of agriculture is given (Chapter 3). This is followed by descriptions of soils, particularly as a source of nutrients (Chapter 4), a chapter on effects of land degradation (Chapter 5) and chapters on raising yields by fertilizer use (Chapter 6) and improved water supplies (Chapter 7). Readers whose interest is in agricultural development rather than in the technologies that help to make it possible may prefer to omit these four chapters. The three that follow deal with broader issues: examples of changing land use (Chapter 8) and the means of increasing agricultural production in developing countries (Chapters 9 and 10). These two latter chapters point to the probability that more land will be used for food production where land is available and cheap. However, raising crop yields by the means described in the earlier chapters will become increasingly necessary. As the populations of many developing countries are projected to increase for more than 50 years, and some for over 100 years, the land will need to remain productive, that is, agricultural output must be increased and this increase must be sustainable. Chapter 11 gives an overview of, and refers to uncertainties that may affect, food production in the future.

The great diversity worldwide of economic and social conditions, climates and soils makes it impossible for one book or one author to discuss the required agricultural development of individual countries. Further, decisions will be made within each country by farmers, the national government or both, ideally acting together. There are, however, general principles to be followed if agricultural development is to be successful. These principles emerge in the successive chapters.

Readers who are specialists will be aware that many references I have used are secondary sources of information. This could not be avoided, because I have tried to put the management of the land and its soils into the broad stream of agricultural development on which our supply of food depends. If specialists with more direct knowledge of the conditions in their own country or region put similar emphasis on the management of the land and its soils my broad treatment will have been justified.

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