Crop production depends on the successful implementation of the agricultural and water management technologies. This is vital to feed the growing world population. The implementation of technologies is also important to minimize environmental degradation resulting from agricultural activities. Agricultural and natural resources engineers are applying scientific principles for the optimal use of natural resources in agricultural production.

Water is the scarcest resource. The importance of the judicious use of water in agricultural sector for sustaining agricultural growth and the retardation of environmental degradation needs no elaboration. Judicious use of water for crop production requires knowledge of water conveyance and application methods, their designing, strategic management of water resources, land and watershed management, etc. Increasing efficiency in conveyance and pumping systems are also of great concern. Irrigation management strategy practiced in normal soils may not be appropriate in problematic soils such as saline soils. This book covers all of the above aspects. In addition, the book covers some recent dimensions such as pollution from agricultural fields, modeling in irrigation and water management, application of the geographical information system (GIS) in irrigation and water management, and renewable energy resources for irrigation. Sample workout problems are provided to explain the design and application methodologies in practice.

The comprehensive and compact presentation of this book will serve as a textbook for undergraduate students in Agricultural Engineering, Biological Systems Engineering, Bio-Science Engineering, Water Resource Engineering, and, Civil and Environmental Engineering. It will also be helpful for the students of relevant fields such as Agronomy, Biological Sciences, and Hydrology. Although the target audience of this book is undergraduate students, postgraduate students will also be benefited from the book. It will also serve as a reference manual for field engineers, researchers, and extension workers in several fields such as agricultural engineering, agronomy, ecology, hydrology, civil, water resource, and environmental engineering.

Effort was made to keep the language as simple as possible, keeping in mind the readers of different language origins. Throughout the book, the emphasis has been on general descriptions and principles of each topic, technical details, and modeling
aspects. However, the comprehensive journal references in each area should enable the reader to pursue further studies of special interest. In fact, the book covers broad interdisciplinary subjects.

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