



# **Crop Production in Waterlogged Saline Soils**



**S.K. Gupta  
I.C. Gupta**






**CROP PRODUCTION  
IN WATERLOGGED  
SALINE SOILS**

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# **CROP PRODUCTION IN WATERLOGGED SALINE SOILS**

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## PREFACE

To even out the inequity in the distribution of water resources in the country and to meet the water demand for domestic, industrial and agricultural sectors of the arid and semi-arid region, India decided to develop its water resources. The approach called for water conservation, storage, diversion and transportation of water from regions with excess water to the deficit ones. Such an approach initially led to increased production and productivity and provided needed food security to the country. Nonetheless, the approach has now come under attack from many quarters as a result of environmental degradation. The most conspicuous adverse environmental effects have appeared in the form of waterlogging and soil salinity affecting land and water resources. The vast stretches of once productive agricultural lands have gone out of cultivation leading to the development of "wet deserts".

The problem of waterlogging and soil salinity is not only confined to irrigated land but land in coastal humid and sub-humid regions is also affected by the twin problems due to tidal influence or some other action. It has been estimated that overall about 5.1 million ha of agricultural land is suffering as a result of waterlogging and/or soil salinity.

Researchers in the country have come out with sound technically and economically feasible technologies for the reclamation and management of waterlogged salt affected lands. The technologies for the reclamation and management of alkali lands have been well received. A large chunk of these barren lands have been reclaimed which is now producing food grains valued at Rs. 1000 crores per annum. However, the technical breakthrough achieved in the reclamation and management of waterlogged saline soils has not yet been translated into field practices at the farmers' field. It is recognized that it could be as a result of non-availability of these technologies to the people in the affected areas and as a result of technologies being costly and requiring a group approach rather than a single farmer approach which was applicable in the case of alkali land reclamation.

Realizing these handicaps, an attempt has been made by



the authors to collate the existing technologies and put them in print in a manner that these could be grasped by the concerned people. The book has been logically divided into chapters, successively dealing with the technological components in each chapter. The first chapter discusses the extent, distribution and nature of the problems to familiarise the readers with various issues. The diagnostic analysis procedures are discussed in chapter 2. The issue of soil salinity in the root zone which is the root cause of non-sustainability of irrigated agriculture is discussed in chapter 3. Technologies for water table control which could be applied both in humid/sub-humid and semi-arid/arid regions is discussed in chapter 4. The technology for leaching of saline soils and related issues form the part of the 5th chapter. Crop production practices and the alternate land management technology are included in chapter 6. Reclamation of coastal saline soils which in itself is specialized task is discussed in a separate chapter. Most of the issues that have been discussed for waterlogged inland saline soils have been briefly discussed in this chapter for the coastal regions. Differences in the approach for these soils vis-a-vis coastal saline soils have been brought out. Finally the socio-economic aspects which are important to decide the economic viability of rehabilitation projects have been included in the last chapter. Unlike in other books where nomograph and tables are included for drainage design, herein computer programmes have been included which is the modern approach in dealing with issues of design and development.

In this book, the work of many scientists and institutions have been included. Herein, we acknowledge the contribution of each of them. We are specially thankful to Dr. NT Singh, Dr. KVGK Rao, Dr. OP Singh, Dr. DP Sharma, Dr. Gurbachan Singh, Dr. KN Singh, Dr. AK Batra, Dr. A. Swarup and others of the Central Soil Salinity Research Institute, Karnal who have been in the forefront of developing reclamation technologies for the reclamation and management of such degraded lands.

We hope that this book will be immensely useful to researchers, teachers and students, command area authorities, extension workers and above all the farming community of India. Any attempt made in the reclamation with the help of this book will give us immense satisfaction.

— Authors

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