

Handbook of Saline and Alkali Soils

Diagnosis, Reclamation
and Management



**Handbook of Saline and Alkali Soils :
Diagnosis, Reclamation and Management**

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PREFACE

Salt affected soils have been a part and parcel of the landscape since time immemorial. Although people knew that excessive salts in soils reduce productivity and the land value, only half hearted efforts were made to reclaim these soils. It is attributed to the scanty information available to the people in those times and investments on reclamation being uneconomical and risky. Groups of researchers were working at various institutions around the globe to unravel the fundamental principles of land reclamation and develop technologies to reclaim these soils. Voluminous information was generated in countries like India, USA, USSR, Australia, Hungary and many other nations. Establishment of United States Regional Salinity Laboratory in 1937, which was rechristened as US Salinity Laboratory in 1951 provided a real impetus to the research activities on salt affected soils. The Laboratory in 1954 brought out the publication titled 'Diagnosis and Improvement of Saline and Alkali Soils' which is popularly known as USDA Handbook 60. It had a global impact on the reclamation and management of salt affected soils. Even today, it is a treasured possession of people dealing with salt affected soils in any manner.

India, during all these years, was also charting its own course through groups of people engaged in understanding the formation, reclamation and management of salt affected soils. The scattered information on the subject available with these groups was compiled by Agarwal and Gupta. It was published by the Indian Council of Agricultural Research (ICAR) in 1968 as Technical Bulletin 15. At about the same time, ICAR-Central Soil Salinity Research Institute (CSSRI) was established on 1st March 1969 with its headquarters at Karnal, Haryana, close to the village Munak, where first report of soil salinity emerged in 1855. Establishment of ICAR-CSSRI proved to be a landmark in the history of salinity research in India.

ICAR-CSSRI, within a year of its establishment, successfully tested the alkali land reclamation technology. Over the years, the technology was passed on to the state governments as a result of which about 2.07 M ha of alkali lands have been reclaimed, till now. Besides increased production of food grains, it has huge socio-economic impact. Simultaneously, the institute also made significant dent in the reclamation of saline soils, development of salt tolerant crop varieties, reclamation of coastal saline soils, reclamation and management of Vertisols, use of saline and alkali water and reuse of domestic wastewater. The institute has researched almost all facets of salt affected soils and poor quality water and widely applied reclamation and management technologies under real field situations.

The information included in this handbook has emerged from the concerted research efforts of the entire staff of the CSSRI, and its regional Research Stations. Equally good contributions have come from several active groups working at various

State Agricultural Universities of India. We also borrowed few salient research results from the international literature available at our command. In spite of our deep desire to acknowledge each and everyone contributing to these efforts, we refrained from naming individuals mainly for the two reasons. One the list is long and two we do not wish to miss anyone which in spite of our best efforts is likely to happen. As a testimony to the efforts made by the scientists, we have included the most relevant literature with appropriate citation. We decided to place on record our indebtedness to the esteemed directors of CSSRI for their administrative acumen and guidance. We take this opportunity to place on record our hearty thanks to Drs. D.R. Bhumbra, Late J.S.P. Yadav, I.P. Abrol, N. T. Singh, N.K. Tyagi, Gurbachan Singh, D.K. Sharma and current director P.C. Sharma. We also acknowledge with thanks the efforts put in by various reviewers namely Drs. M.J. Kaledhonkar, D.S. Bundela, A.K. Rai, Bhaskar Narjary, B. Nirmalendu and Ashim Datta. They unhesitatingly accepted our request and critically reviewed the chapters in a time bound manner.

The CSSRI is in its 50th glorious year. Several national and international recognitions have been bestowed upon the institute during these years. Although a matter of great satisfaction, the institute has a long way to tread. Many complex and challenging problems are awaiting solutions. We are confident that the new generation of scientists equipped with new knowledge and capabilities and able guidance of senior people will be able to resolve these issues. We hope this handbook will help initiate the entry of the new generation of scientists into the fascinating world of salinity research. We also hope and believe that the handbook will serve as a reference book to the scientists engaged in salinity research and to the officers of the line departments engaged in land reclamation.

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