

STUDY
ON
WASTELANDS
INCLUDING
SALINE, ALKALI
AND
WATERLOGGED LANDS
AND THEIR
RECLAMATION MEASURES



COMMITTEE ON NATURAL RESOURCES
PLANNING COMMISSION
NEW DELHI
1963.

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FOREWORD

One of the ways of stepping up agricultural production is through extension of area under cultivation by reclaiming wastelands for cultivation wherever such reclamation can be carried out economically. The total area classified as "other uncultivated lands excluding fallows" and "fallows other than current fallows"—the two categories of land in which wastelands are known to be available—during 1958-59 was 127·4 million acres, out of which 50·9 million acres has been estimated as "culturable waste." The Wastelands Survey and Reclamation Committee of the Ministry of Food and Agriculture which was entrusted with the task of locating large blocks of wastelands and suggesting suitable reclamation measures in the different States has completed its survey of 13 States, namely, Punjab, West Bengal, Bihar, Mysore, Andhra Pradesh, Madhya Pradesh, Kerala, Madras, Uttar Pradesh, Jammu & Kashmir, Maharashtra, Orissa and Gujarat. In these States, the area of wastelands available for cultivation in blocks of 250 acres or more is reckoned at nearly 2 million acres. The total area of wastelands in such large blocks for the entire country is likely to be more than 3 million acres as large blocks of wastelands are known to be available in Rajasthan and Assam also, reports in respect of which have not been completed by the Committee. The Committee has expressed the view that the mere collection of statistics under the head "culturable waste" can serve little purpose and has recommended collection of detailed information about the location and types of wastelands in each State, the ownership of such lands, their availability in sizeable blocks and the cost of reclamation measures by rapid reconnaissance. The Planning Commission has approved of an expenditure of Rs. 69 lakhs in the Third Plan for survey of wastelands in blocks of less than 250 acres. Several States have taken up this survey work. It is essential to have information of the location of all these categories of wastelands in the States in small blocks as also in large blocks and the economics of their reclamation measures for increased agricultural production. The social aspects of this problem has also to be kept in view as the problem of utilisation of wastelands involves not merely the adoption of agricultural techniques but also appreciation of the problem of the settlement of agricultural labour. Unless this information is urgently collected, the limited resources of the country cannot be fruitfully utilised for land reclamation and settlement.

(iii)

The present report on the "Study on Wastelands of India, including Saline and Alkali and Waterlogged Lands and their Reclamation Measures" prepared by the Committee on Natural Resources of the Planning Commission contains valuable information on the different categories of wastelands and their reclamation measures and will be very useful to the State Governments in their work of land reclamation and resettlement. The recommendations made in the report have special significance from the resource point of view regarding proper utilisation of marginal lands which are at present under cultivation with low productivity and may become waste in due course.

The recommendations made in the report are of practical importance. Some of them should, as far as possible, be implemented during the Third Plan. The remaining recommendations should be given due consideration in the formulation of the Fourth Plan.

NEW DELHI,
January 7, 1963.

SHRIMAN NARAYAN,
Member,
Planning Commission.

INTRODUCTION

The Committee on Natural Resources at their meeting held on 26th December 1961 approved a study on water-logged, saline and alkali lands and wastelands of India. The Technical Committee on Land, on 3rd January 1962, set up a Working Group with membership as below to carry out this study:

1. Dr. B. N. Uppal, Agricultural Adviser, Punjab.
2. Shri R. D. Dhir, Chief Engineer (Flood control), Central Water and Power Commission, New Delhi.
3. Dr. R. V. Tamhane, Soil Conservation Adviser, Ministry of Food and Agriculture, Department of Agriculture.
4. Shri K. P. Sagreiya, President, Forest Research Institute, Dehra Dun.
5. Shri U. S. Madan, Director, Soil Conservation, Central Water and Power Commission (co-opted).
6. Dr. S. P. Raychaudhuri, Senior Specialist, Land Resources, Planning Commission (Convener).

The main object of this study was to collect all the existing information on the occurrence of saline, alkali and water-logged lands, to examine all the reclamation measures for such lands and to analyse the data available with a view to suggesting policy measures. The economics of reclamation of such areas by the application of different methods was also to be studied.

The Working Group met at Chandigarh from 21st to 23rd April, 1962. Sub-groups of experts were set up to study the relevant problems. For each sub-group a convener was appointed to collect and coordinate all the information which became available. On the basis of the information so collected, a draft report was prepared and discussed at a meeting held on the 29th December 1962 in which the representatives of the Planning Commission, the Ministry of Food and Agriculture, Ministry of Irrigation and Power, Indian Council of Agricultural Research and a few State Governments took part. The study is, therefore, the collective work of a large number of experts including economists, soil scientists, engineers and soil conservation and forestry experts from the Government of India as well as the States. The major brunt of the study fell on the shoulders of

Dr. S. P. Raychaudhuri, Senior Specialist (Land), who with his indefatigable industry, co-ordinated the entire material in its present form.

Chapter I of the present study deals with land utilisation statistics of India, concepts in land utilisation statistics and soil map and areas under each soil group.

Chapter II deals with the survey of wastelands. The Wastelands Survey and Reclamation Committee has grouped the following three categories of land and designated them as "other uncultivated land excluding fallow lands":—

- (i) Permanent pastures and meadows;
- (ii) Areas under miscellaneous trees and crops; and
- (iii) Culturable waste.

The category "Culturable waste" has been defined to include all lands available for cultivation but not taken up for cultivation or abandoned after a few years for one reason or the other. In addition to the above three categories, land classified as "fallow other than current fallows" has also been included in the wasteland category by the Wastelands Survey and Reclamation Committee. The Committee has further pointed out that the concept of "other uncultivated lands excluding fallow lands" was not yet clearly understood. Land which were classified as "culturable waste" at the time of settlement some years ago still cannot continue to be classified as such in the revenue records even though they cannot be made culturable after incurring any reasonable expenditure. Similarly, some of the lands which were culturable continue to be classified as barren and unculturable or pasture land. In some cases, pasture lands have been included in the category of "culturable waste". The Committee has, therefore, come to the conclusion that the areas included in the two categories, namely, "other uncultivated lands excluding fallow lands" and "fallow lands other than current fallows" may not truly represent the actual extent of culturable wastes in the country. For the purposes of the report, however, the Wastelands Survey and Reclamation Committee has utilised the data furnished to them by the revenue and agricultural agency of each State under the above two heads.

In the present study, in addition to the above two categories of land, saline and alkali lands and also water-logged lands which may be producing some crops but of low yield, have been included.

Chapter III gives a brief review of the work done on the reclamation of wastelands caused by erosion and weed infestation.

Chapters IV to VII deal with the saline and alkali lands including coastal salines, their locations, extent, problems of reclamation, and demarcation of areas with sweet and saline ground water table. Trees, grasses and crops suitable for growing in such lands, and techniques evolved for the reclamation of saline and alkali lands are also described.

Chapters VIII to XII deal with water-logged lands, their extent, location, variations of depths of water-table, trees, grasses and crops suitable for growing in such lands, methods of reclamation of such lands, and utilisation of such areas for deep-water paddy and pisciculture.

The review of work done on soil conservation and reclamation during the First and Second Five Year Plan periods is given in Chapter XIII along-with a mention of the schemes of the III Plan. In Chapter XIV use of aerial photography in soil mapping and land-use classification with particular reference to saline, alkali and water-logged lands is stressed. The recommendations which emerge from this study are dealt with in Chapter XVI.

The detailed break-up of land classification statistics of States have been included as Appendix II. Maps and photographs have been included to illustrate the points made out in the text.

Substantial information has been collected in this study which can lead to policy measures for reclamation of such lands in the Fourth and subsequent Five Year Plans.

M. S. RANDHAWA,
Adviser (Resources).

New Delhi,
January 5, 1963.

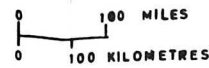
Study Team

In this study on wastelands, including saline and alkali lands, and water-logged lands, the following participated.

- | | |
|-------------------|--|
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| G.S. Dhillon | . Chief Conservator of Forests, Punjab. |
| G.C. Chatterjee | . Incharge Ground Water Division, Geological Survey of India. |
| Satwant Singh | . Nasirpur Farm, Punjab. |
| A.S. Venugopalan | . Secretary, Wastelands, Survey and Reclamation Committee, Ministry of Food and Agriculture. |
| K.D. Sharma | . Research Officer, Planning Commission. |
| S.P. Raychaudhuri | . Senior Specialist (Land Resources) Planning Commission, Convener. |

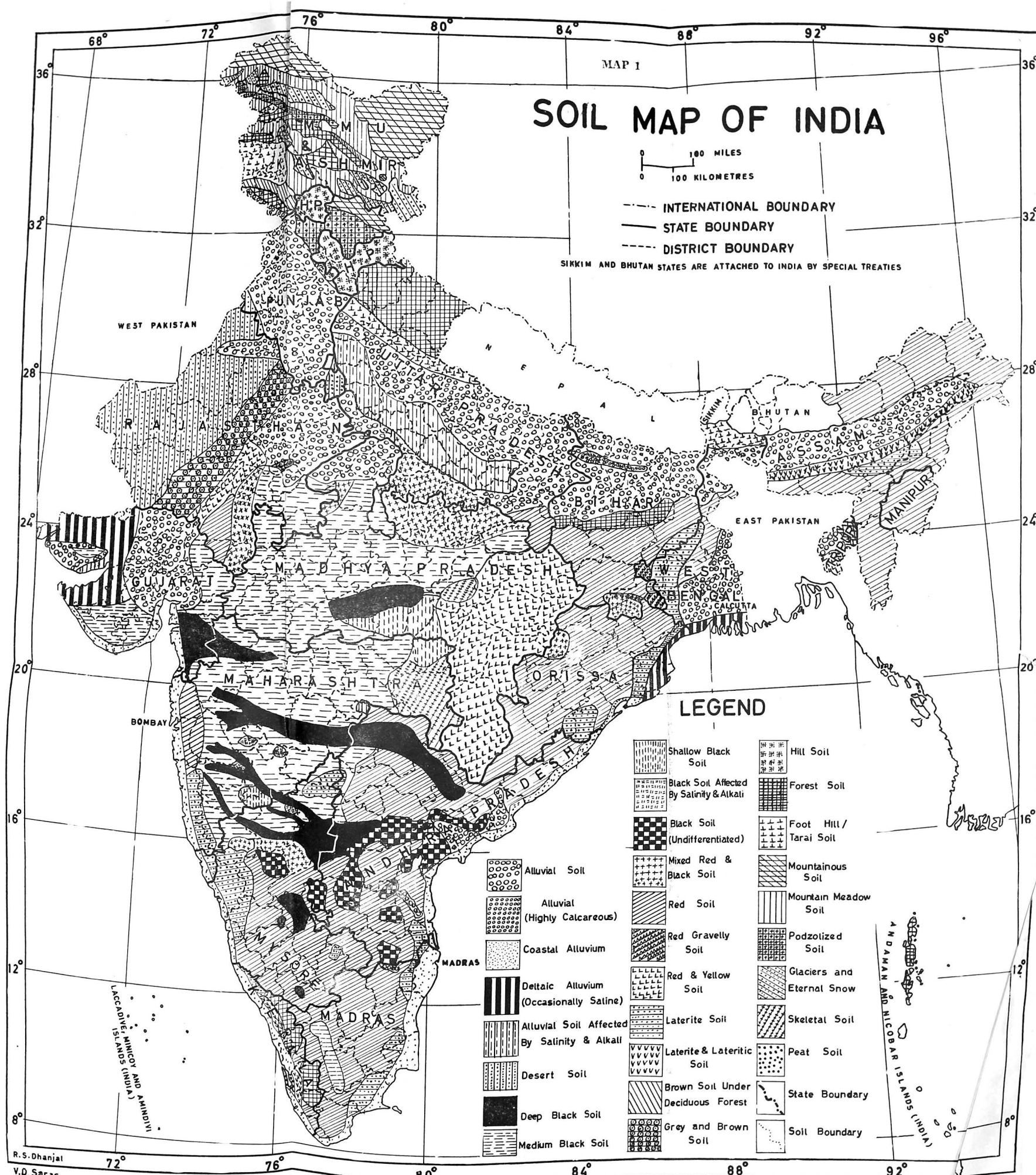
SOIL MAP OF INDIA

MAP 1



- INTERNATIONAL BOUNDARY
- STATE BOUNDARY
- - - DISTRICT BOUNDARY

SIKKIM AND BHUTAN STATES ARE ATTACHED TO INDIA BY SPECIAL TREATIES



LEGEND

- | | | | |
|--|---|--|---------------------------|
| | Shallow Black Soil | | Hill Soil |
| | Black Soil Affected By Salinity & Alkali | | Forest Soil |
| | Black Soil (Undifferentiated) | | Foot Hill / Tarai Soil |
| | Alluvial Soil | | Mountainous Soil |
| | Alluvial (Highly Calcareous) | | Mountain Meadow Soil |
| | Coastal Alluvium | | Podzolized Soil |
| | Deltaic Alluvium (Occasionally Saline) | | Glaciers and Eternal Snow |
| | Alluvial Soil Affected By Salinity & Alkali | | Skeletal Soil |
| | Desert Soil | | Peat Soil |
| | Deep Black Soil | | State Boundary |
| | Medium Black Soil | | Soil Boundary |
| | Mixed Red & Black Soil | | |
| | Red Soil | | |
| | Red Gravelly Soil | | |
| | Red & Yellow Soil | | |
| | Laterite Soil | | |
| | Laterite & Lateritic Soil | | |
| | Brown Soil Under Deciduous Forest | | |
| | Grey and Brown Soil | | |

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Prepared at the Indian Agricultural Research Institute, New Delhi - 1961

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