



GEOGRAPHICAL STUDY OF USAR LANDS IN ROHTAK DISTRICT OF HARYANA

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Abstract: *Land is the basic and most important resource to the mankind. All agricultural, animal and forestry production depend on the productivity of land. The land resource is limited as the total geographical area is fixed. Under these conditions, every part of the land is important for us and for the nation. Out of the several problems that limit the economic utilization of land resources in India, the problem of usar lands (saline and sodic soils) the so called self-affected soils is of great concern. In India alone, about 7 million ha of the cultivated land are affected by salinity and sodicity. In Haryana it is about 0.50 million ha i.e. 7.1 per cent of the total salt affected soils of India. The intensive irrigation and the excessive use of water have created the problems of water logging, soil salinity and soil sodicity. Usar land is defined as that land where the vast patches of white efflorescence salt called 'Reh'. Such type of lands need special attention because they are quite different in nature from other type of lands. The main purpose of the research work was to identify the nature of usar land of study area.*

In Haryana all districts are affected with salt concentration. In Rohtak district the area under usar lands is 1358, 513, 523, 455 and 390 ha in Rohtak, Sampla, Kalanaur, Lakhan Majra and Meham blocks, respectively. The present study was conducted in five villages namely Rithal Narwal (Rohtak Block), Ismaila (Sampla Block), Lahli (Kalanaur Block), Kharak Jattan (Lakhan Majra Block), and Madina Korsan (Meham Block), which were affected by usar lands (salt-affected soils) above 10 per cent to the cultivable area of the village. Lahli village (Kalanaur Block) covered the highest usar lands area (248 ha) in Rohtak district. It is about 22.75 per cent of the cultivable area. Kharak Jattan (Lakhan Majra Block) covered the lowest usar lands area (50 ha). It is about 10.86 per cent of the cultivable area.

To know the nature of usar land (saline and sodic soils), the 25 samples of soil i.e. 5 samples of soil from each village have been collected. After testing of all soil samples, both types of usar lands (saline and sodic soils), were found present in the study area.

Keywords: *Usar Lands, Saline Soils, Sodic Soils, Reh.*

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INTRODUCTION

Land and soil are precious natural resources and are Nature's gift to the mankind. The prosperity of a country depends on the richness of these resources. In a country like India, where the population pressure on land is high, rational utilization of the land resources assumes great importance for the optimum and sustained production with minimum hazards. India is the seventh largest and second most populous country in the world. The population of the country was 1027015247 persons in 2001 and in 2011, it is 1210193422 persons. In India, 75 per cent of the population live in villages and out of this 70 per cent of the population is engaged in agriculture activities.

Land is the basic and most important resource in Haryana, as it is true for nearly all other states of the country. All agricultural, animal and forestry productions depend on the productivity of the land. The land resource is limited as the total geographical area is fixed. The amount of land and land-based resources is, then finite. Land is, therefore, scarce in supply. Under these conditions, every part of land is important for us and for the nation.

Out of the several problems that limit the economic utilization of land resources in India, the problem of usar lands (Saline and Sodic soils) - the so called salt-affected soils is of great concern. The problem is a world-wide phenomenon affecting most of the countries of the arid and semi-arid regions. According to one estimate, over 950 million ha of the land are affected by this menace in North America, Mexico, Central America, South America, several parts of Asia, Australia and Europe (Evans, 1974; Bhumbla, 1980; Bresler *et al.* 1982). In India alone, about 7 million ha of the cultivated land are affected by salinity and sodicity. In Haryana, it is 0.50 million ha. The problem has been increasing gradually with the advent and expansion of canal and tube well irrigation projects because of the faulty management of water. The scientific investigations on the nature, origin, amelioration and management of the salt-affected soils in India date back to more than a century (Agarwal and Gupta, 1968; Agarwal *et al.*, 1979; Bhumbla, 1980; Abrol, 1982a).

Usar land is defined as that land where the vast patches of white efflorescence salt called 'Reh' Such type of lands need special attention because they are quite different in nature from other type of lands. Usar lands (salt-affected soils) have been classified into two main categories: Saline Soils and Sodic Soils. The main purpose of the present study first was to identify the nature of usar lands of study area.



DATA BASE

The data for the present study has been collected from numerous sources. The agricultural data has been obtained from Rohtak, Meham and Sampla tehsils of Rohtak district and District Revenue Records office. The village-wise data has been recorded from Lal Kitab and detailed from 'Khasa Girdawari' with the help of village patwaries.

The other relevant data pertaining to study has been obtained from both the published and unpublished literature, which has been obtained from the following sources:

1. Census of India (2001).
2. Census of India (2011).
3. Soil Survey office, Rohtak.
4. Soil Conservation office, Rohtak.
5. Ground Water Cell office, Rohtak.
6. Deputy Director of Agriculture office, Rohtak.

METHODOLOGY

In the present study wherever required percentages has been calculated and data for various attributes has been represented in a tabular form or by statistical diagram. No mechanical aid has been taken in either processing or the tabulation of field data. The whole affair has been managed manually. The data was processed in order to make it useful interpretative. This was done with a view to economising time, labour and finance. But the main purpose was accuracy and authenticity.

Map is the highest tool of the geographer. The bulk of the statistical data was therefore, used to the preparation of most of the maps. The data was converted into per centage for their use in the tables. In fact, all the rationalizations have done on the basis of these maps using, statistical and semi-statistical methods. A graphic representation of the data has also been made in order to facilitate the projection of trends.

STUDY AREA

Haryana is one of the fast developing states of India. It lies between 27° 39' to 30° 55' North latitude and 74° 28' to 77° 36' East longitude comprises large part of Indo-Gangetic plain. Agriculture is the main stay, since soil constitutes its major natural resources.

The present study relates to the Rohtak district of Haryana state. The Rohtak district lies in the south east of Haryana state between 28° 19' to 29° 18' North latitude and 76° 13' to 77°



12' East longitude and falls in the semi-tropical region of north India. The district has an irregular boundary, frequently changing from time to time. Now-a-days it is bounded by Sonipat district in the East, Hisar and Bhiwani districts in the West, Jind district in the North and Jhajjar district in the South. The Rohtak is one of the 21 districts of Haryana state and situated in West of the Union Territory of Delhi as shown in figure -1.

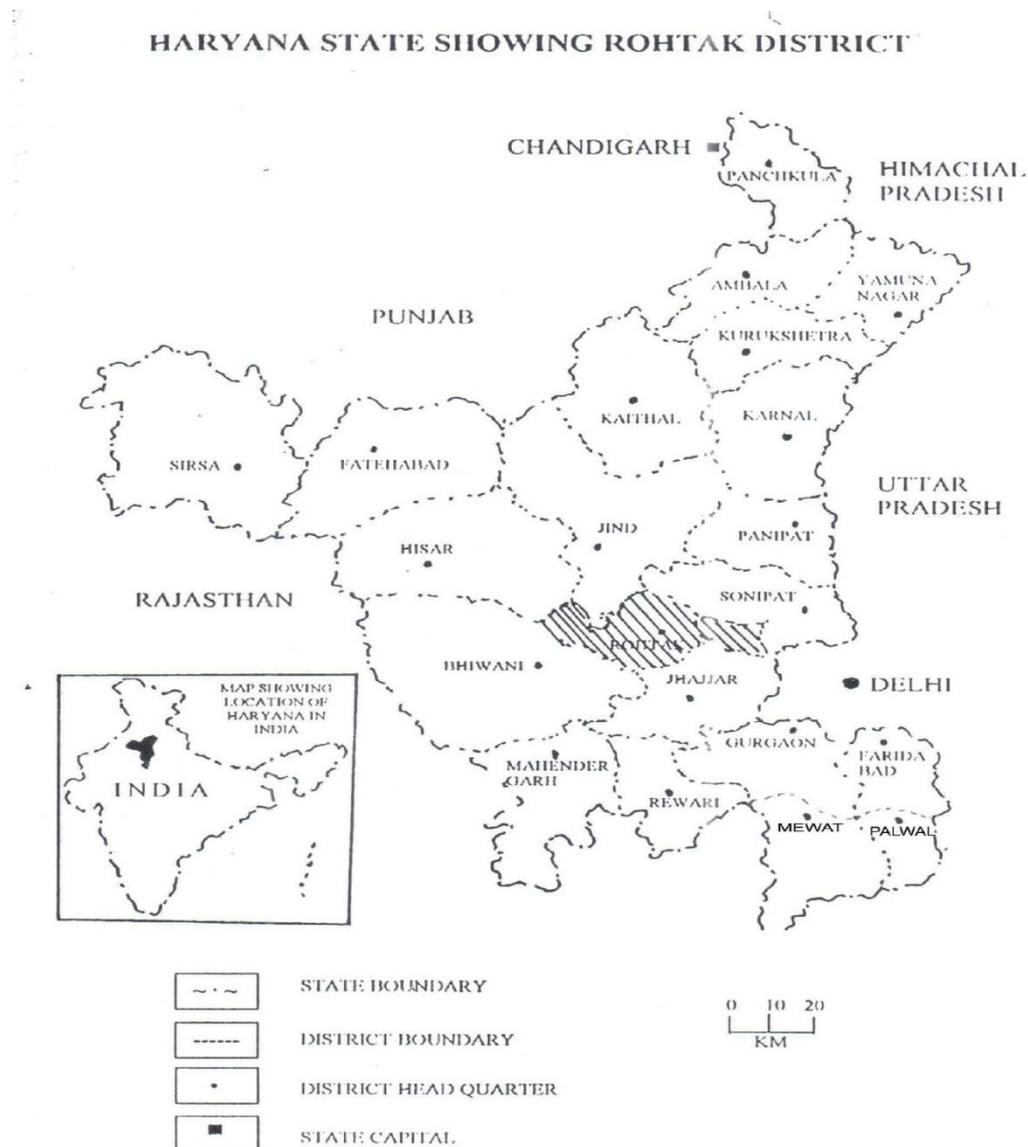


FIGURE-1

The total geographical area of the Rohtak district is 1668 sq. kms or 167311 ha. The district includes three tehsils namely Rohtak, Meham and Sampla comprised of 5 CD blocks viz. Rohtak, Sampla, Kalanaur, Lakhan Majra, and Meham (figure - 2). Rohtak is the largest tehsil in the district with an area 1200 sq. Kms. There are 147 villages and 3 towns namely Rohtak, Meham and Kalanaur (Table-1). According to 2011 census the total population of the district



is 1058683 persons. Out of which the rural population is 613864 persons and urban population is 444819 persons.

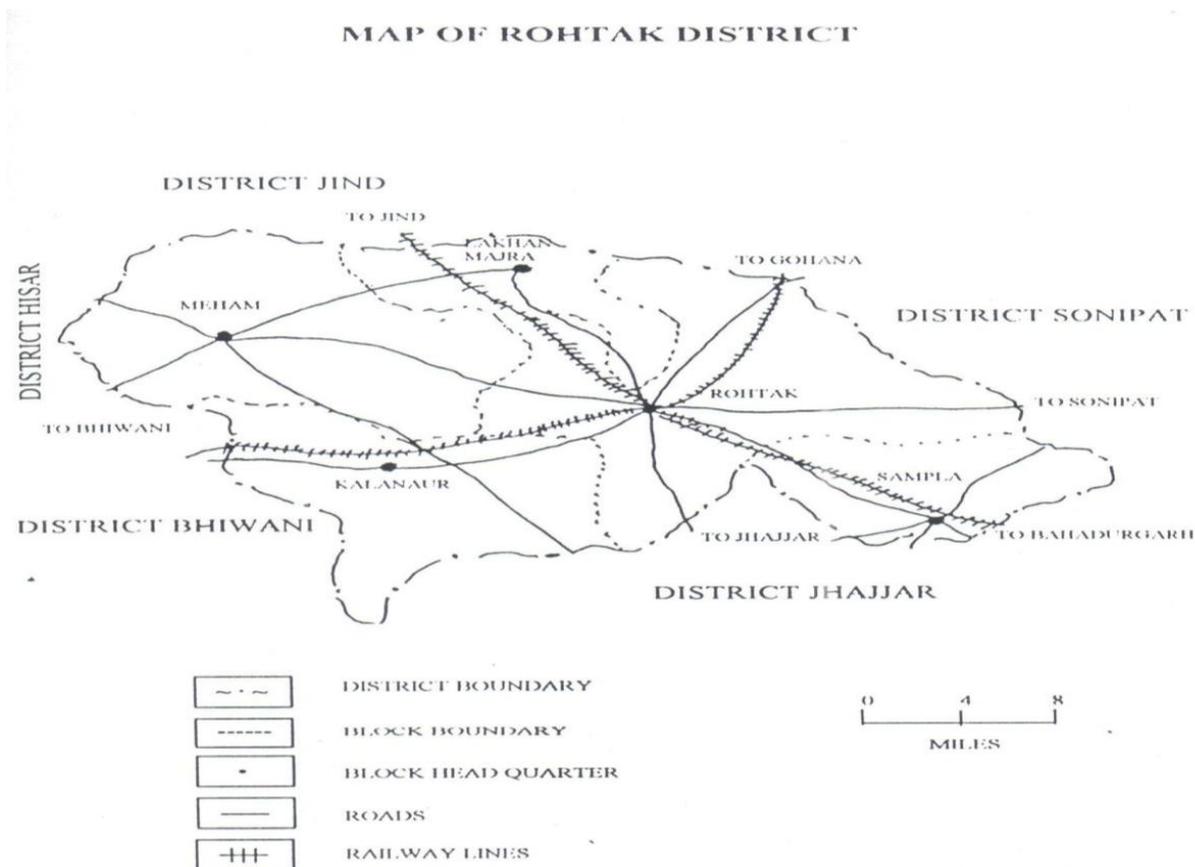


FIGURE-2

TABLE – 1 TEHSILS, BLOCKS AND VILLAGES IN ROHTAK DISTRICT

S. No.	Blocks	Tehsils	Villages	Area (ha)
1.	Rohtak	Rohtak	57	56813
2.	Sampla	Sampla	24	22658
3.	Kalanaur	Rohtak	27	29842
4.	Lakhan Majra	Rohtak	14	17026
5.	Meham	Meham	25	40972
Total	5	3	147	167311

Source: Deputy Director of Agriculture office, Rohtak

BLOCK-WISE DISTRIBUTION

Salt-affected soils are of high fertility but the presence of the soluble salts make it uncultivable. In due course of time these salts are accumulated so much, so that it prevents the farm crops to grow or yield high production.



In Haryana about 0.50 million ha of land is affected by salinity and sodicity problems. All districts of Haryana are affected with salt concentration. Block wise distribution of usar lands in Rohtak district is given in table -2 (see also figure -3).

TABLE - 2

BLOCK-WISE DISTRIBUTION OF USAR LANDS IN ROHTAK DISTRICT

S. No.	Blocks	Cultivable Area (ha)	Area under usar lands (ha)	Per centage
1.	Rohtak	46502	1358	2.92
2.	Sampla	19494	513	2.63
3.	Kalanaur	25273	523	2.07
4.	Lakhan Majra	14402	455	3.16
5.	Meham	34178	390	1.14

Source: Soil Conservation office, Rohtak

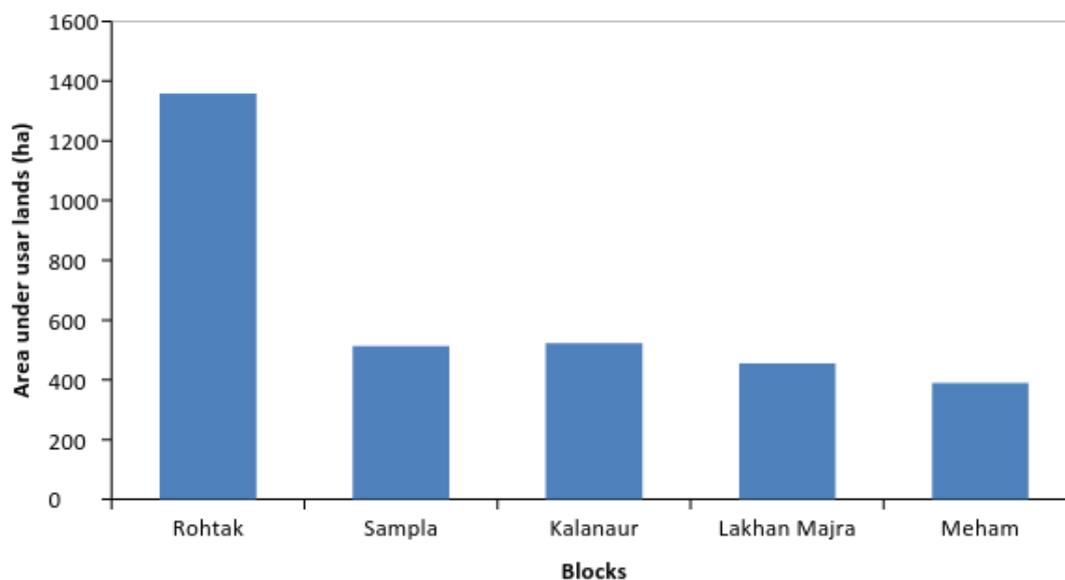


FIGURE-3 BLOCK-WISE DISTRIBUTION USAR LANDS IN ROHTAK DISTRICT

VILLAGE LEVEL STUDY

The present study was conducted in five villages namely, Rithal Narwal (Rohtak Block), Ismaila (Sampla Block), Lahli (Kalanaur Block), Kharak Jattan (Lakhan Majra Block) and Madina Korsan (Meham Block) i.e. one village per block, which were affected by salty soils/usar lands above 10 per cent to the cultivable area of the village (figure-4). Table-3 reveals the village-wise distribution of usar lands in study area of the district. (see also figure-5)

SALT AFFECTED VILLAGES IN STUDY AREA OF
ROHTAK DISTRICT



FIGURE-4

TABLE – 3 VILLAGE-WISE DISTRIBUTION OF USAR LANDS IN STUDY AREA OF ROHTAK
DISTRICT

S. No.	Villages	Blocks	Cultivable Area (ha)	Area under usar lands (ha)	Percentage
1.	Rithal Narwal	Rohtak	667	125	18.74
2.	Ismaila	Sampla	1070	120	11.21
3.	Lahli	Kalanaur	1090	248	22.75
4.	Kharak Jattan	Lakhan Majra	460	50	10.86
5.	Madina Korsan	Meham	1692	185	10.93

It is clear from the table - 3 that Lahli village (Kalanaur Block) covered the highest usar lands area (248 ha) in Rohtak district. It is about 22.75 per cent of the cultivable area. Kharak Jattan (Lakhan Majra Block) covered the lowest usar lands area (50 ha). It is about 10.86 per cent of the cultivable area.

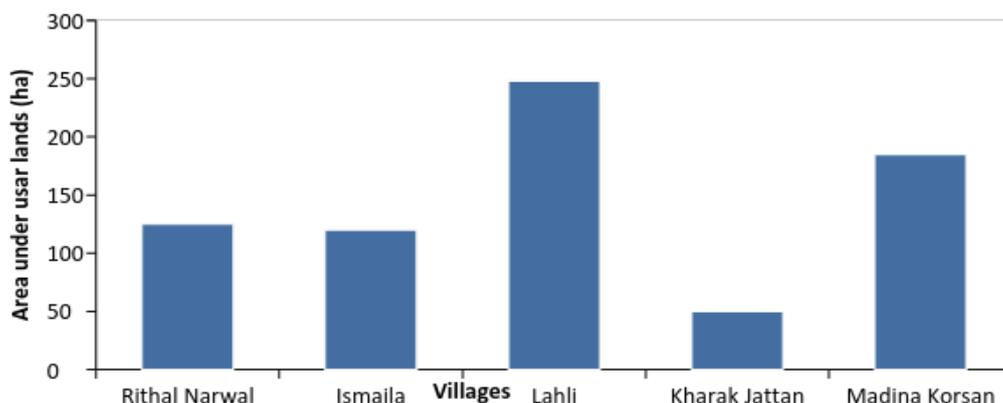


FIGURE – 5 VILLAGE -WISE DISTRIBUTION OF USAR LANDS IN STUDY AREA OF ROHTAK DISTRICT

COLLECTION METHOD OF SOIL SAMPLES

Soil is the soul of agriculture in arid and semi-arid parts of the country, where the nature precipitation does not occur at proper time. To check the growth of usar lands (salt-affected soils) in Rohtak district, it is necessary to collect samples from usar lands affected villages in district. It is also necessary to assess the soil quality of the villages for the proper development plan for agricultural production in the study area.

To know the nature of usar lands (Saline and Sodic Soils), the 25 soil samples i.e. 5 samples of soil from each village have been collected from different locations in 5 blocks of the district. A proper collection of soil sample is very necessary to represent the actual conditions of the area from which it is collected. Generally, soil samples for the present study are collected from the surface up to 6 inches (15 cms) depth with the help of khurpa.

ANALYSIS OF SOIL SAMPLES

Analysis of soil is not a new thing in our country. Soil analysis enables us to assess the need of fertilizers for a particular type of soil. Soil analysis in India helps in determining the fertility status of soils and in diagnosing the nutrient deficiencies of crops in study area.

Every farmer requires information on regarding utilization of fertilizers in quantities and qualities as per his field. The primary purpose of soil analysis is to enable the farmers to get such information. Hence, it is necessary to analyse characteristics of soil, which affects usar lands (salt -affected soils) in the study area of Rohtak district. The results of soil samples on their pH and EC values are given in Tables 4, 5, 6, 7 and 8.



TABLE – 4 SOIL ANALYSIS OF VILLAGE RITHAL NARWAL (ROHTAK BLOCK)

S. No.	Farmer's Name	Texture	pH	EC
1.	Sh. Sant Ram	Loam	8.3	3.60
2.	Sh. Satbir Singh	Loam	9.3	0.88
3.	Sh. Umed Singh	Loam	7.9	0.85
4.	Sh. Shyam Sunder	Sandy Loam	8.5	0.35
5.	Sh. Rajbir Singh	Loam	11.6	6.30

TABLE – 5 SOIL ANALYSIS OF VILLAGE ISMAILA (SAMPLA BLOCK)

S. No.	Farmer's Name	Texture	pH	EC
1.	Sh. Mehtab Singh	Loam	8.1	3.90
2.	Sh. Raj Kumar	Loam	8.0	6.40
3.	Sh. Jagbir Singh	Loam	9.2	7.00
4.	Sh. Krishan	Loam	7.7	0.65
5.	Sh. Kartar Singh	Clay Loam	10.1	2.90

TABLE – 6 SOIL ANALYSIS OF VILLAGE LAHLI (KALANAUR BLOCK)

S. No.	Farmer's Name	Texture	pH	EC
1.	Sh. Narender Kumar	Loam	10.3	1.50
2.	Sh. Ram Partap	Loam	8.5	0.74
3.	Sh. Man Mohan	Loam	7.9	2.90
4.	Sh. Rajender Kumar	Loam	8.9	3.65
5.	Sh. Jugresh Kumar	Loam	8.8	1.00

TABLE – 7 SOIL ANALYSIS OF VILLAGE KHARAK JATTAN (LAKHAN MAJRA BLOCK)

S. No.	Farmer's Name	Texture	pH	EC
1.	Sh. Bhale Ram	Loam	8.3	0.46
2.	Sh. Ram Phal	Loam	8.2	0.83
3.	Sh. Ranbir Singh	Loam	8.5	1.82
4.	Sh. Dalbir Singh	Loam	8.7	0.38
5.	Sh. Deepak	Loam	8.2	2.90

TABLE – 8 SOIL ANALYSIS OF VILLAGE MADINA KORSAN (MEHAM BLOCK)

S. No.	Farmer's Name	Texture	pH	EC
1.	Sh. Ram Niwas	Loam	8.5	0.86
2.	Sh. Sajjan Singh	Loam	8.5	0.98
3.	Sh. Jagat Singh	Loam	9.2	0.40
4.	Sh. Rajbir Singh	Loam	9.0	0.38
5.	Sh. Mehar Singh	Sandy Loam	8.6	0.17



All the 25 soil samples were tested to determine the pH and EC values. The soil water reaction which shows pH below 8.5 is saline and pH above 8.5 is Sodic.

After testing the pH and EC of the soil samples, both types of usar lands (Sodic and Saline soils) were found in all five villages of the study area. One village i.e. Rithal Narwal in Rohtak block of the district has the highest pH value (11.6) and EC value (6.3) in the soil. In this village the soil is not suitable for all the agriculture crops and steps should be taken to reclaim the land for getting good yield of ordinary crops.

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