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# Utilization of Usar Lands

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**Abstract: 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. Usar land is defined as that land where the vaste patches of white efflorescence salt called 'Reh'. 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.**

**The needs of growing population of our country can be fulfilled by increasing the agricultural production through the utilization of usar lands as an economic source of mankind. Thus, the utilization of usar land is urgently needed for growing population in Rohtak district. In Rohtak district, where 70 per cent of the total population earns their livelihood from agriculture, it is essential to suggest new methods for utilization of usar lands.**

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

## Introduction

All types of lands are naturally not of the same value for utilization and production. Lands with fertile soil are good for production while, other lands having unfavorable conditions and less fertile are not suitable for cultivation. The later type of land left unutilized lies in the condition of wasteland. The wasteland includes usar land and ravine land. Salt-affected land in known as usar land in Haryana. This type of land can easily be recognized by a white efflorescence of salt on the land surface and known as Reh in Haryana. Usar land is mostly barren with only a few patches of grass. It may be known as saline and sodic.

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. The prosperity of a country depends on the richness of land and soil 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. Land as a factor of production is very peculiar since it possesses some important features, which distinguish it from other factors of production. Life without land is inconceivable. 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. It is essential to suggest new methods for utilization of usar lands (saline and sodic soils) in the study area.

## Crops, Grasses and Trees for Sodic Soils

### Crops

The proper choice of crops during the reclamation of sodic soils is also important. The growing crops tolerant to excess exchangeable sodium can ensure reasonable returns during the initial stages of the reclamation. In Table 1, the important crops are listed according to their relative tolerance to soil sodicity based on the results of several field studies. This list may serve as a guide in determining the crops and the cropping sequence for such soils. In general, crops that can withstand excess moisture conditions can also tolerate more sodic conditions. As compared to others, rice is an ideal crop of sodic soils. The rice cultivation results in a high and continual removal of exchangeable sodium due to mobilization of nature insoluble calcium carbonate, chiefly by its increased hydrolysis and solubility due to carbon dioxide libration by rice plant roots (Chhabra and Abrol, 1977). Thus, it accelerates the reclamation process.

### Grasses

A considerable part of the sodic soils is the village common lands meant for community purposes, including grazing grounds for cattle. To put these lands under crops like rice and wheat after reclamation would not be advisable, as this would deprive the village of common lands which are essential for cattle grazing and other community purposes. In

view of this and extreme pressure on the available land resources, it would be more realistic to bring these lands under a system of agro- forestry by growing suitable trees and grasses.

Karnal, Rhodes, Para and Bermuda grasses are highly tolerant to sodic conditions and can be successfully grown in sodic soils (Anonymous, 1986). When these grasses are grown, there is a continuous decrease in soil sodicity with time and an improvement in the soil physical properties due to the biological action of grass roots. Thus, the growing of tolerant grasses not only provides the much needed forage for cattle population, but also improves the soil by increasing sorption of runoff water and by reducing run off and soil losses due to erosion.

**Table 1: Relative tolerance of some crops and grasses to sodic soils**

| Tolerant* | Semi- tolerant | Sensitive |
|---|---|---|
| Karnal grass | Wheat, Barley | Cowpeas, Gram |
| Rhode grass | Raya, Senji | Groundnut, lentil |
| Para grass | Berseem | Mash, Green peas |
| Bemuda grass | Sugarcane | Peas, Maize, |
| Rice, Sugarbeet, Sesbania | Bajra, Sorghum | Cotton at germination |

*Crop yields are seriously affected if ESP in more than 55, 35 and 10 in respect of tolerant, semi-tolerant and sensitive crops, respectively. Tolerance in cash column decreases born top to bottom. The grasses are highly tolerant and some, like Karnal grass, will grow even in soils of ESP 80 to 90.

**Trees**

The species like Eucalyptus, Erosopis juliflora and Acacia milotica can be grown in highly sodic soils, if seedlings are planted in 90X90 cm pits after treating them with gypsum and FYM. If tree seedlings are planted in auger holes filled with gypsum and FYM treated soil, they made excellent growth and there was a 100 per cent survival of the planted seedlings (Abrol, 1982 a). This technique holds promise for large-scale adoption in the afforestation programmes for the sodic soil area. The likely benefits from the agro-forestry programmes in the sodic soils include the conservation of valuable soil and water resources, the availability of wood for fuel and consequently the greater availability of animal waste for manurial purposes; thus, reducing the demand for already costly fertilizers. Apart from the direct benefits, the indirect contribution of these programmes leading to a better environment cannot be ignored.

**Crops, Grasses and Trees for Saline Soils**

**Crops**

Like sodic soils, the proper choice of crops during the reclamation of saline soils in also important. The growing of crops tolerant to excess salinity can ensure reasonable returns during the initial years of reclamation. The relative response of different crops to salinity in shown in Table 2. This table can serve a guide to make the choice of crops and the cropping sequence for saline soils.

**Grasses**

A large portion of saline soils is also a part of the village common lands, meant for community purposes like grazing. Thus, it is more realistic to bring these lands under a system of agro-forestry by growing suitable trees and grasses. Several grass species have been reported to grow well in the highly saline soils (Table 2).

**Trees**

For establishing tree species in the waterlogged saline soils, the emphasis should be on preventing the salt accumulation and allowing the aeration within the root zone. The planting of seedlings of Casuarina, Tamarix, Acacia, Prospis, Terminalis, Calistimon and Eucalyptus in the furrow-cum-irrigation channels greatly improved their establishment in the initial stages of the plant growth. Abrol and Gill (1983) presented a comprehensive list of trees which can tolerate the salinity soil in their relative sense as Table 3 reveals.

**Table 2: Crop groups based on response to salt stress**

| Sensitive Groups | | Resistant Groups | |
|---|---|---|---|
| Lentil | Radish | Spinach | Barley |
| Mash | Cowpea | Sugarcane | Rice (transplanted) |
| Chickpea | Broad bean | Raya | Cotton |
| Beans | Vetch | Rice (direct) | Sugarbeet |
| Peas | Cabbage | Wheat | Turnip |
| Carrot | Cauliflower | Pearl millet | Tobacco |
| Onion | Cucumber | Oats | Safflower |
| Lemon | Gourds | Alfalfa | Taramira |
| Orange | Tomato | Blue panic grass | Karnal grass |
| Grape | Sweet potato | Para grass | Date palm |
| Peach | Sorghum | Rhode grass | Ber |
| Plum | Millets | Sudan grass | Mesquite |
| Pear | Maize | Guava | Casuarina |
| Apple | Clover | Pomegranate | Tamarix |
| | Berseem | Desi babul (acacia) | Salvadora |

**Table 3: Trees species and their relative tolerance to soil salinity**

| Sl. No. | Botanical Name | English/ Common Name |
|---|---|---|
| (Highly Tolerant) | | |
| 1 | *Tamarix articulatavahi* | Athel tarmarisk, farash |
| 2 | *Tamarix gallica* | Tarmaris, Farash |
| 3 | *Casuarina cunning* | Riveroak, srub she-oak, |
| 4 | *Casuarina equisetifolia* | Australian Plne, beef wood tree |
| 5 | *Prosopis juliflora* | Mesquite bean |
| 6 | *Acacia nilotica* | Babul, Kikar desi |
| 7 | *Acacia deccurrens* | Green and silver wattle |
| 8 | *Acacia catechu* | Khair, Jerusalem Thorn |
| 9 | *Zizyphus jujube* | Ber, Kool and Chinese date |
| 10 | *Zizyphus spina* | Christs thorn and nubk tree |
| 11 | *Butoamonos perma* | Palas, dhak, flame of forest |
| 12 | *Ailanthus excelsa* | Maharuk, Tree of Beaven |
| 13 | *Terminalia arjuna* | Arjun Tree, Kaku |
| 14 | *Capparis aphylla* | Ker, kerro, kureal |

| (Moderately Tolerant) | | |
|---|---|---|
| 1 | *Acacia cyanophylla* | Blue wattle |
| 2 | *Acacia deccurren* | Black and silver wattle |
| 3 | *Parkinsonia aculeate* | Parkinsonia, Horse bean |
| 4 | *Eucalyptus camedulensis* | River red gum, green gum |
| 5 | *Eucalyptus citridora* | Tree lemon |
| 6 | *Eucalyptus tereticoris* | Blue gum, bastard box gum |
| 7 | *Azadira chtaindica* | Neem |
| 8 | *Albizzia lebbec* | Siris |
| 9 | *Dalbergia sisso* | Shisham, sisoo , tahali |
| 10 | *Leuaena leucocephala* | Ipil- ipil, Subaful |
| 11 | *Bauhinia alvavar* | Bull hoof tree, Kahnar |
| 12 | *Populus euphratica* | Poplar |
| 13 | *Pinus halepensis* | Aleppo fir, Jerusalem pine |

**Pasture**

The usar lands which are considered unfit for development for agricultural and forestry, can be utilized for pasture development. In study area (Rohtak district) such types of lands can properly be developed as grass lands and may be described as mediocre pasture land. The following grass naturally grow on salts affected areas as Khar-Usar (*Sporobolus arabicus*), Bhur Burui (*Sporobolus coromandelianus*), Usranta (*Chloris virgata*), Dab (*Acagrostis cynosuorides*) Dub, (*Cynodon dactylon*) and Jargi (*Andropogon annulatus*).
It has been observed that low-ling areas Dub and Gandar grasses naturally grow in the district. Khar Usar and Usranta are useful grasses which grow on usar, but disappear after the rains. Besides these grasses Dab, Dub, Jargi and Gandar can also be grown in usar area of the district.

**Social Forestry**

Trees, by providing food, fiber and shelter to mankind, have a unique position among the various natural resources of a nation. They help in maintaining a clean, healthy and benign environment in stabilizing the soil, in preventing soil and water erosion in controlling runoff water in catchment areas in protecting against heat, wind, sand and dust storms and in contributing substantially to economic development. Most of the usar lands (salts-affected soils) of Rohtak district belong to the Forest Department and the private land owners. The usar land of the study area can be made available for agricultural and afforestation programmes through proper soil and water treatment and by training the poor masses. The treatment of the usar land for afforestation needs amendment in soil characteristics with pyrites, gypsum etc. as recommended by various scientists. Sulphuric acid may also be used to germinate small trees on such soils. It is important that while digging the pits for afforestation the Kankar pan should be broken and testing of the soil done to know the nature and sustaining capacity of the soil to grow plants. To get rid of this problem of such soils the plantation area should be divided in plots of different sizes. The accumulated water inputs will remain for a long tune while usar land may be reduced by using sulphuric acid. Thus the plantation programme may be made successful in such areas. Table 4 indicated that in the salt-affected areas following types of trees can be selected for different uses.

**Table 4: Tree selection in usar lands**

| Sl. No. | Requirements | Tree Selection |
|---|---|---|
| 1. | Fuel Wood | Eucalyptus, *Acacia arabica*, Siris, Proposals, Babul |
| 2. | Fodder | Siris, Acacia, Neem, Sahjan and Jangal Jalebi |
| 3. | Small Wood | Siras, Shisham, Lasora etc. |
| 4. | Food and fruits | Mango, Guava, Jamun, Anwla, Kathal etc. |
| 5. | Environmental | Neem, Bargad, Peepal, Dhak etc. |

**Live Stock**

Haryana State is famous for its Haryana and Murrah breeds of cows and buffaloes, respectively. Not only in state but also all over the country, the Rohtak district is known for its milch animals, both cows and buffaloes. The grazing lands in the study area are already degraded. Availability of fodder, thus, becomes a major constraint. Production of green fodder and crop residues needs to be increased in order to meet the present deficit. It is also essential that new varieties of good, perennial, nutritional and disease free fodders are developed. Also the usar lands should be developed into pastures by growing suitable grasses. The growing of tolerant grasses provides the much needed forage for cattle population.

**Dairy Farming**

Despite the large cattle wealth, organized dairy industry has not been developed in Rohtak district and in the absence of an assured remunerative market for milk most of the high-class milch animals bred here are exported Mumbai, Kolkata, Chennai and other big cities. The farmer can be interested in maintaining quality milch animals for commercial milk production only if he finds a ready and remunerative market for milk near at hand. The venture of Delhi Milk Scheme to provide such a facility has, however, not succeeded so far in this district for various reasons. Firstly, the Delhi Milk Scheme has not taken any fruitful measures to increase milk production in the area. Secondly, it has not been offering an attractive price. The price at which milk is sold for local consumption is generally higher that what the Delhi Milk Scheme offers. With industrialization and resulting urbanization in some areas of the district, local demand of milk has increased considerably. At present there is one Vita Milk Plant in Rohtak city and it is very beneficial for farmers.

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