PROBLEM OF WATERLOGGING AND SALINITY IN DHANANA VILLAGE OF BHIWANI DISTRICT OF HARYANA: A CASE STUDY

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Abstract:

Water-logging and salinization continue to cause economic losses in many areas of the world, though farmers and scientists have been aware of these problems. An area is said to be waterlogged when the water table rises to an extent that soil pores in the root zone of a crop become saturated, resulting in restriction of normal circulation of the air, decline in the level of oxygen and increase in the level of carbon dioxide. The study tries to highlight the problem of water logging and salinity in Dhanana village, district Bhiwani, Haryana. In the present study waterlogged area (Figure2) was classified under two categories one where there was clear surface ponding as "waterlogged area" and salinity appear on ground other wherethere was high moisture content as "area sensitive to water logging". From interview the study reveals that the farmers are not aware that how they can minimize the problem of water logging and salinity. So here the study suggest that this is a great problem and govt. should take action to reduce the problem and give some scientific solutions.

Keywords: Water-logging, Salinization, Water table, Root zone, Circulation.

Introduction:

The problem of waterlogging is related to those areas, which have saline and brackish groundwater and canal irrigation has put into practice. The abundant supply of irrigation water tempts the farmer to use more water than the requirement of the crop. The excess water supplied to the field would percolate into the soil. Due to constant percolation of larger quantity of water, the groundwater table would be raised so much that it might completely saturate the root zone of the crop. The agricultural land in this state is waterlogged and this phenomenon is known as waterlogging. Further, in course of time such land turns saline and unfit for cultivation. Alkalinity and salinity are the byproducts of waterlogging. Salinity means the predominance of chlorides and sulphates of sodium, calcium and magnesium in the soils in sufficient quantity tobe able to seriously interface with the growth of plants. Salinity in Dhanana (Bhiwani) is the result of over irrigation in canal irrigated areas. In canal irrigated areas plenty of the water is available and the farmers indulge in over irrigation of their fields under such conditions, the ground water level rises and saline efflorescence consisting of salts appear on the surface as a layer of white salts through capillary action. Water logging becomes a serious problem. India hasalready shortage of land and in which cultivable land convert into Westland.

This makes food Security over problematic. The area under salt affected soils in the country is 6.727 million hectares. An estimated area of 2.46 million hectare land is suffering from water logging in irrigation commands in India. Out of the total geographical area of the Dhanana village 88.7% is under cultivation. Underground water is relatively high. The village is faced serious with the problem ofbrackish water and water logging / salinity. An attempt has been made to identify the water intensity and the severity of waterlogging problem and salinity in Dhanana village.

Study Area:

The study area lies between latitudes and longitudes 28.9329° N, 76.1639° E, having an aerial extent of 69351.2882 hectare. It is situated on 216 m from mean sea level. Dhanana is located northern part of Bhiwani, as shown in Fig 1. The annual average rainfall in the study area is 464 mm. mostly black and clay soil is dominant in Dhanana village. The area is intensivelycultivated and mostly irrigated. Wheat, mustered in rebind cotton, Rice are the main crops in kharif season. The area is mainly irrigated through the Mitathal feeder and Jui feeder and its distributaries. The geographical area of the village 69351.2882 hectare out of which 61533.7 hectare is under cultivation and 4424.2952 hectare covered by settlement. Physiographical, the area is lowland in North-East to South-West direction.

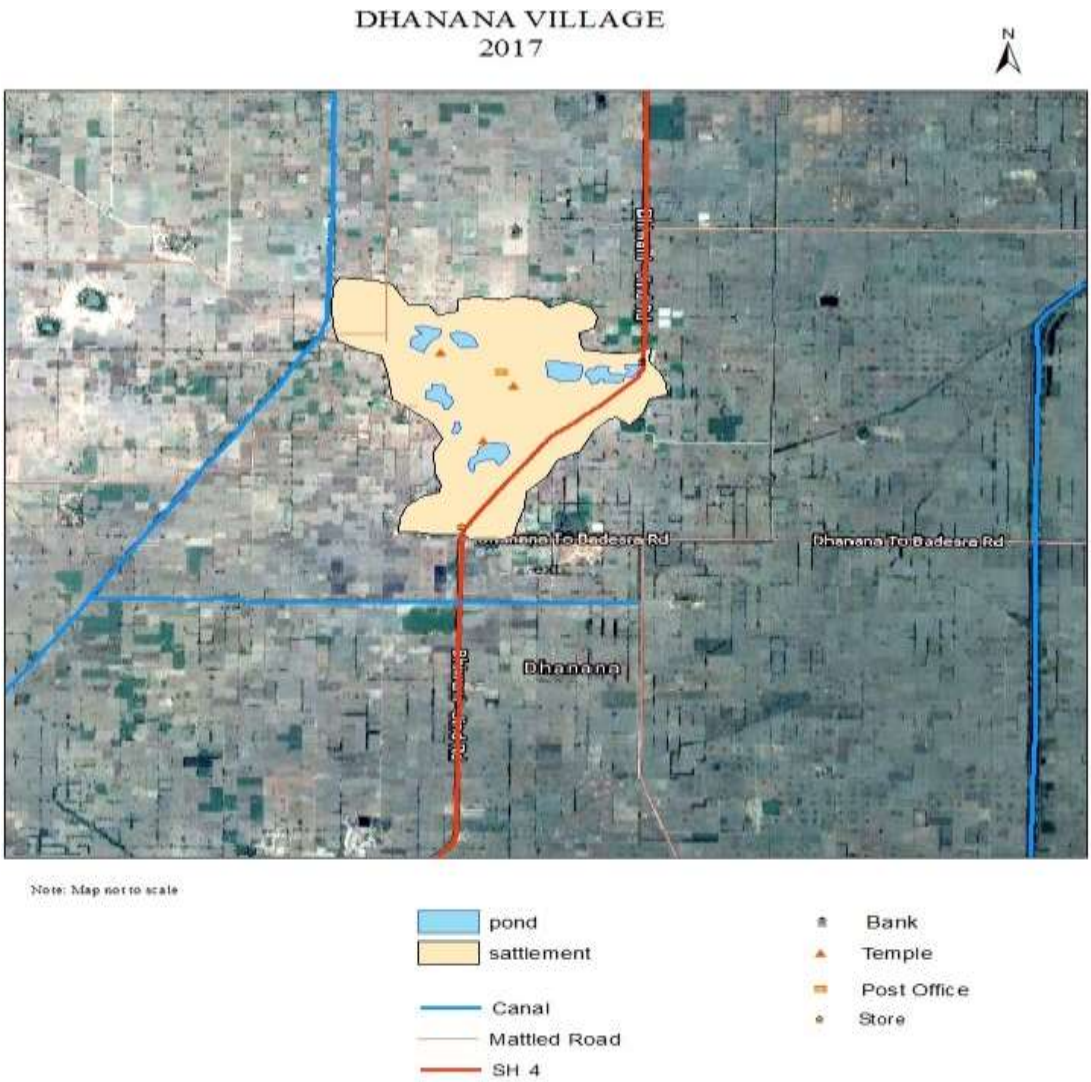

Fig.1: Study Area

Data base and Methodology:

The present study is based on both primary and secondary data. Primary data is collected from field survey was undertaken to check water logging and salinity in village. Secondary data collected from cultivate Patwari (Bhiwani) and irrigation department (Mundhal). Table and Maps are used for analysis.

Discussion:

Main waterlogging area:

Water-logging problem appeared in many places in Dhanana village. The reasons of water-logging in Dhanana is due to surface irrigation, seepage from Canal or sand removing or drainage system is not found and rice cultivating. Water-logging is being a big problem in Dhanana, because the area of permanent water-logging is 0.1239 acres approximately. The soil texture in this area is fine black varies from 172 m depth in east, 0 to 180 m in south east. The salt affected area appeared in white where the salt efflorescence was clearly visible. In the map, three waterlogged areas are depicted viz. seasonal waterlogging, associated with salinity, permanent waterlogging.

Seasonal water logging:

These areas are surface pounded areas due to flooding by river water or submergence byrain water or human intervention in natural drainage systems where the water stagnates for quite a long time. Seasonally waterlogged areas are those low lying or depression areas that get saturated due to heavy rains. They are normal in post-monsoon season. Normally one crop season is affected.

Seasonal water logging associated with salinity:

These are seasonally waterlogged areas but during Rabi and summer the salts come on to surface and affect the crop growth.

Permanent water logging:

These are the areas where there is a continuous surface pounding of water or soil profile issaturated for one or more seasons. Permanent water bodies, jheels, Tals, lakes, mangroves, etc. we're not included in surface ponding class. More than one cropping Season is affected.

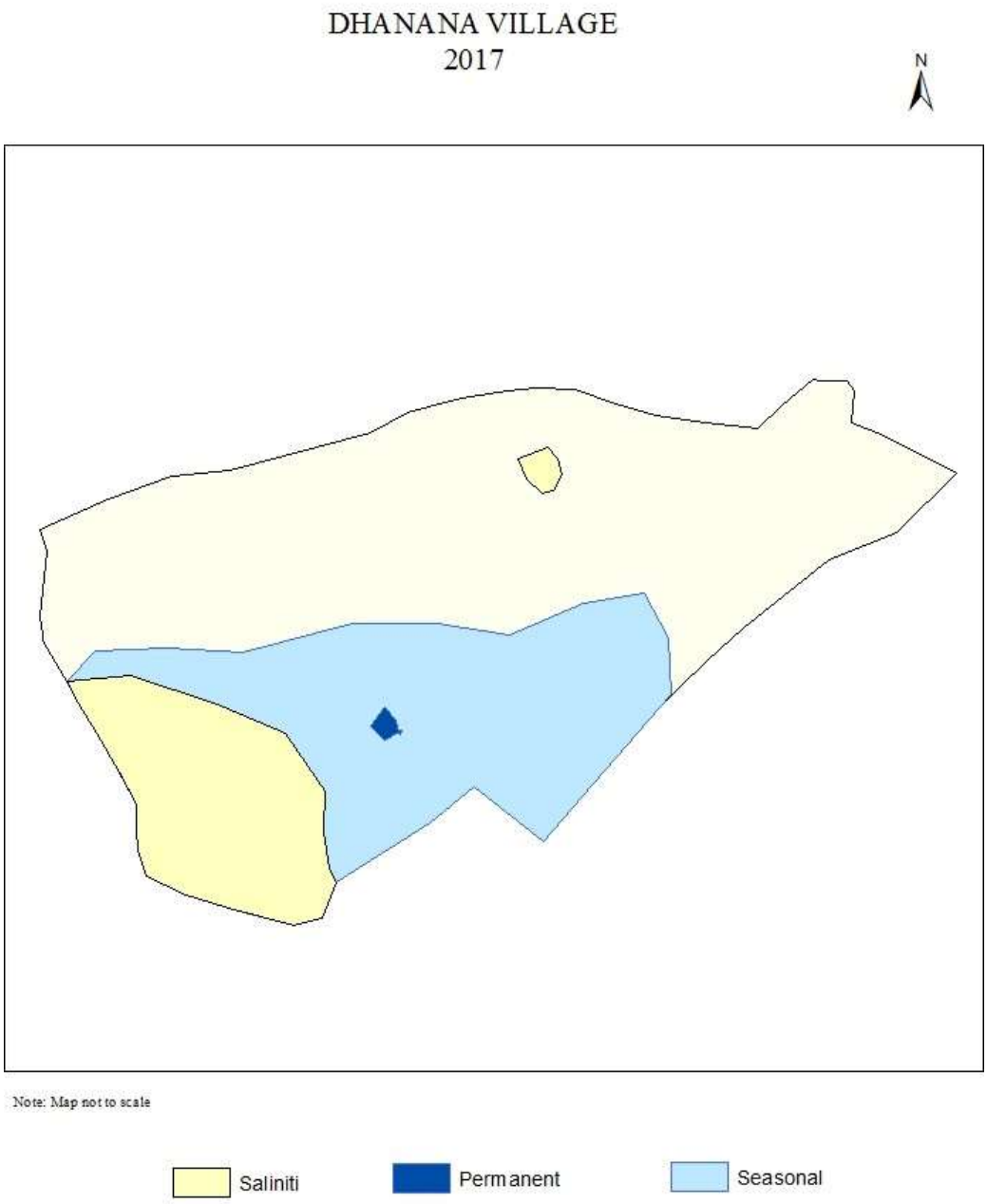

Fig.2: Major Waterlogged and Saline Area

Figure shows major waterlogged area in village. The permanent water logged area since 1995 due to occurrence of flood. And the seasonal water logging is occur in Rabi season mainly. This is due to clay soil of village and excess water don't infiltrate into the soil. After the evaporation the salt is appeared in the field.

Main Causes of waterlogging:

Due to high dependence on cotton, wheat, paddy and the excessive use of chemicals fertilizer coupled with flood irrigation with poor quality underground water the soil fertility has been affected. Main causes of waterlogging include excessive irrigation and lack of adequate drainage system, seepage from canal because they are not cemented, over irrigation, higher use of chemical fertilizer, flood, and excessive rainfall causes increase in waterlogging.

Human perception regarding waterlogging:

The local farmers were interviewed about water table depths, salinity problems and village under water logging and Crop productivity. In interview the farmers said that they don't takeany step to reduce this problem because they think that govt. could plan about this problem like plantation of Eucalyptus in the waterlogged areas and change in cropping pattern of that area.

Conclusion:

Water logging becomes a serious problem. Out of the total geographical area of the Dhanana village 88.7% is under cultivation. Underground water is relatively high. The village is faced serious with the problem of brackish water and water logging / salinity. Mostly black and clay soil is dominant in Dhanana village. The area is intensively cultivated and mostly irrigated. Wheat, mustered in Rabi and cotton, Rice are the main crops in kharif season. There are seasonally waterlogged areas but during Rabi and summer the salts come on to surface and affect the crop growth. More than one cropping season is affected from permanent waterlogging. From interview the study reveals that the farmers are not aware that how they can minimize the problem of Water logging and salinity. So here the study suggest that this is a great problem and govt.should take action to reduce the problem and give some scientific solutions.

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