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Problems and Potential of Land and Soil: A Major Concern in South 24 Parganas District

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ABSTRACT

Land is one of the natural resources upon which human being have to depend for life supporting food items. It is also the part of biosphere and socio-economic activities of human being mainly depend on it. So maintenance of soil health and its quality is important task for livelihood security. South 24 Parganas is located in the coastal area of West Bengal where the pressure of population on land is extremely high with low cropping intensity. The main cause of such constraints is salinization, waterlogging and lack of irrigation water. The whole South 24 Parganas district has a wide variety of physical condition such as physiographic variation, fresh and saline water ecosystem, agro-climatic uniqueness and soil erosion. Socio-economic conditions also have a sharp variation from one block to another. This region has extremely fragile ecosystems and it is vulnerable to land degradation due to natural and anthropogenic factors. Being the major livelihood of the people, agricultural activity necessitated high productivity and cropping intensity with greater scope of employment generation in this region. The main challenge in this region is not only low fertility status per unit area, but also brackish water incursion and cyclonic storms. So planning, management and monitoring of soil resource is mainly required in the rural areas of the district. The present paper is an endeavour to identify the problems and to explore the prospect of area under study.

Keywords: productivity, cropping intensity, employment generation, land degradation, fragile ecosystem

I INTRODUCTION

Land is not only a basic natural resource, but also a cherished asset. It has to be utilized in accordance with its suitability and ecological capabilities, which depend on climatic and biological factors. Soil is usually defined as “any part of earth crust in which plants grow”. It formed as a result of complex interaction between climatic, topographic and biological factors.

II OBJECTIVES

- To estimate the potential of soil and land resource in South 24 Parganas District
- To establish the relationship between physico-chemical properties of soil and agricultural production
- To narrate the salient features of land use
- To identify the problems and to asses the potential of land and soil

III AREA UNDER STUDY

South 24 Parganas District of West Bengal has latitudinal extension between 21°29′N and 22°33′ 45″ N on one hand and longitudinal extension between 88° 3′ 45″E and 89° 4′ 50″ E on the other. Area of the district is 9,960 sq. km. It has seven municipalities and 29 community development blocks. Bangladesh is located in the east of the District, East Medinipur and Haora District of west Bengal lie in the West, Kolkata and North 24 Parganas District lie in the north and Bay of Bengal is in the South of the study area.

IV MATERIALS AND METHODS

Secondary data have been collected from Soil and Land Use Survey, Government of India, Kolkata, National Bureau of Soil Survey and Land Use Planning, Kolkata, Soil Salinity Research Institute, Canning Town, Census of India, 2011 and District Statistical Handbook, 2014

Primary data have been collected through pre-designed questionnaire on target group of respondents by purposive random sampling method

Methods included preparation of maps based on satellite images followed by computation of weighted index out of secondary data and analysis of primary data as well as preparation of charts and diagrams followed by their interpretation.

V RESULTS AND DISCUSSION

Physiographical Uniqueness of the Area under Study:

The district comprises mainly of recent to sub-recent alluvial plain gradually merged with active deltaic plain in the Sunderban region. Salient physical features of the area are: Low lying alluvial plain .Palaeo-channels along with estuaries having earthen embankments and islands under threat of erosion.

Geology:

The area is covered by alluvial and deltaic deposits of the Quaternary period. This quaternary sediment has been subdivided into two main groups:

a) Recent to sub-recent (newer alluvium)

b) Pleistocene (older alluvium)

Most of the area is dominated by recent to sub-recent alluvium and deltaic deposits.

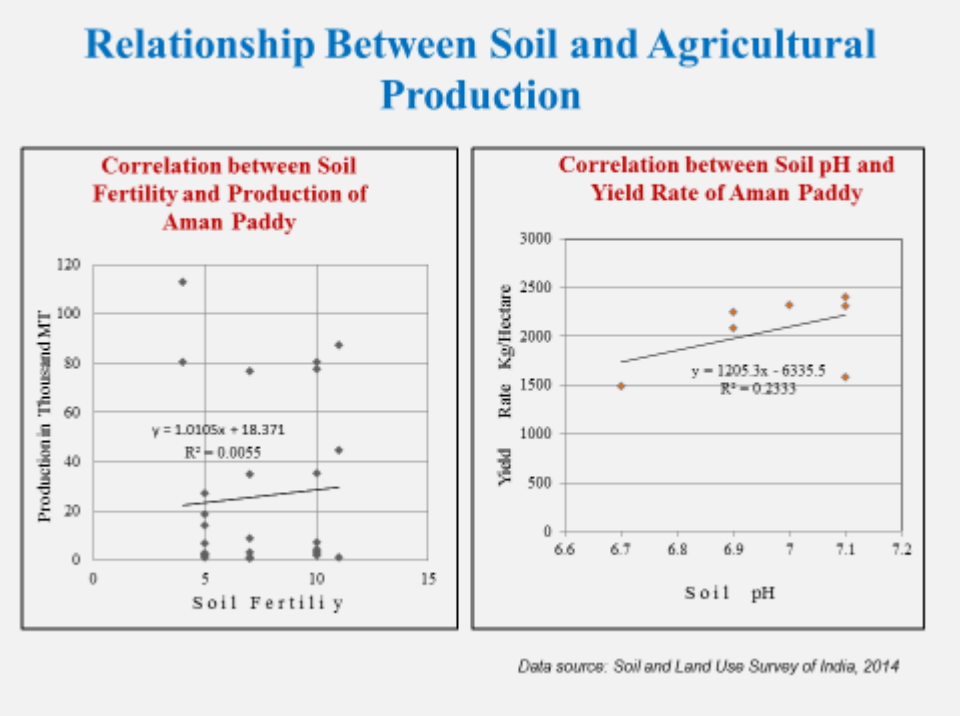
Seasonal Rhythm, Moisture Regime and Natural Vegetation:

The climate of the study area is humid sub-tropical with four distinct seasons: Pre-Monsoon, Monsoon Post monsoon and winter. On the alluvial plain the soil moisture regime is-Ustic. In deltaic plain the soil moisture regime is Aquaic. The natural vegetation consists of mixed deciduous trees and mangroves in the delta areas.

Major Problems of the Area:

High soil salinity is the major problem of the area..Shallow water table enriched with sodium particles contribute to salinity in soil during the xeric periods of winter and early summer. Heavy texture of soils is also another constraint to agricultural productivity.

Influence of tidal waves and recurring inundation by tidal water accelerate salinity .Low lying situation of the land,poor surface and sub surface drainage condition create water logging in the area..Non availability of safe irrigation water during summer and winter season is also responsible for low productivity.Brief spell of winter and prolonged monsoon often lead to water logging.Heavy and intensive rain during monsoon often results in flood and stagnation of water on the arable land.Frequent cyclonic storms coupled with heavy rain cause damage of standing crops.Conversion of Agricultural Land into Aqua cultural farm pond creates another problem. These problems are responsible for mono-cropping with traditional farming practices with low productivity of rice during the *kharif* season.



Types and Causes of Soil Erosion in Mainland and Islands of South 24 Parganas District:

Types of erosion found in this district are:- a) Fluvial b) Aeolian c)Marine d) Accelerated soil erosion induced by human activities.
Main causes of erosion are:- a) Pattering effect of Raindrops ii)Volume of run off iii) High velocity Wind iv) Variation in Relief v)Slope vi) Waves and tides.
Causes of Salinization are:
i)Regular ingress of tidal water
ii) Ascending movement of brackish ground water through capillary action during the xeric period
iii) Impeded drainage condition for a long time

Measures to Arrest Soil Erosion:

A) **Biological Methods:** i) Strip cropping ii) Crop rotation iii) Application of manure and iv) vegetal cover most important.

B) **Mechanical Methods:** i) Control of gullies through retention of runoff water ii) Diversion of run off iii) New structures (embankments) check soil erosion.

C) **Augmentation of soil fertility:** Application of proper management technique through integrated plant- water-soil management helps to improve soil quality.

VI FINDINGS

- Being located in the coastal region, the District South 24 Parganas is characterized by fragile ecosystem both in islands and mainland.
- Dependence on natural assets for livelihood is too much.

- Pressure of population on cultivated land is excessive.
- Degradation of land and soil is caused by both natural forces and anthropogenic interference are found here.
- Improvement in technological innovation is insufficient.
- Alternative source of livelihood is more or less absent.
- Traditionally the district is backward with low agricultural productivity
- Potentiality exists in the field of improvement in agricultural productivity, aquaculture, livestock farming, beekeeping, and in agro- based industries.
- Conversion of agricultural land can be arrested through use of land shaping techniques.

VII CONCLUSION

The main reason of backwardness of the district is low agricultural productivity. Agriculture is not sustainable here. Soil salinity, water logging and lack of fresh water for irrigation is the cause of low productivity. The only way out is the improvement in soil health and it is possible through new technological innovation like land shaping for improving drainage facility, rain water harvesting, salinity reduction, cultivation of crops and pisciculture (freshwater and brackish water) for livelihood and environmental security initiated by Soil Salinity Research Institute located in Canning Town is most effective.

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