Riverine environment and its dynamics:

Challenges, issues and sustainable managements

Edited by

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Stories Matter

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Chapter-4

Changing Pattern of Land Use and Land Cover in Balason River Basin: A Spatio-Temporal Analysis

Rajib Mitra[1], Dipesh Roy[1] & Deepak Kumar Mandal[2]

Abstract

Land use and land cover (LULC) are significant aspect in determining how human impacts interact with the environment; hence it's crucial to predict changes. The empirical analysis revealed a considerable shift in LULC categorization in the Balason River Basin in the Darjeeling region of India. This study attempts to look into how LULC has changed over the past 30 years (1990-2020) in the Balason River Basin. The study area has seen a remarkable growth in population over the years, which has altered the environment of the area. The LULC classification was performed based on satellite imageries, and therefore, Landsat imageries were acquired from the USGS satellite image database from 1990-2020. The Maximum Likelihood Algorithm was chosen for supervised image classification in order to categorize the LULC. The current study has revealed that the amount of forest area, which was around 72.19 percent in 1990, decreased to 59.22 percent in 2005 and 54.53 percent in 2020. Water bodies and tea plantations also have experienced a rapid change in their area through time. Agricultural land and built up areas have remarkably increased from 13.06 to 22.05 percent and 5.15 to 13.72 percent, respectively. The findings highlighted the growing anthropogenic activities, influenced the recharge rates, surface runoff, and soil erosion incidences in the Balason basin. It was suggested that the basin's ecosystem be preserved by replanting the lost native trees. In addition, effective land use planning is necessary for the basin's sustainable management.

Keywords: Land use and land cover (LULC); spatio-temporal change detection; Balason River Basin.

1. Introduction

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