

Name of the Scholar: Raihan Ahmed

Supervisor: Prof. Haroon Sajjad

Department: Geography

Title: “Integrated Watershed Management for Sustainable Development of Natural Resources: A Case Study of Lower Barpani River, Assam”

Abstract

Watershed management is the process of utilizing natural resources for fulfilling the needs of the people and suggesting strategies for lessening the impact on water, soil, vegetation and other natural resources of the watershed. Water, vegetation and soil are the most imperative natural resources for sustainable development and management of the watershed. Thus, the integrated approach is basic requirement for sustainable development and management of natural resources in the watershed. This study makes an attempt to assess water, vegetation and land resources of Lower Barpani watershed for effective watershed management.

The study is based on both primary as well as secondary sources of data. Various methods have been used for studying integrated watershed management for sustainable development of natural resources in the watershed. Various equations and Fuzzy Analytical Hierarchy Process were used to examine influence morphometric parameters on erosion risk. Threshold, maximum likelihood classifier, Radiative Transfer Simulation Model, Normalized Difference Vegetation Index was utilized for assessing surface water. Analytical Hierarchy Process, weighted linear combination, linear correlation were used for assessing ground water resource. Temperature Vegetation Dryness Index and Normalized Difference Moisture Index were utilized for examining

seasonal vegetation growth in forested area. Food and Agricultural Organization scheme and Fuzzy Analytical Hierarchy Process were used for assessing land resource.

Morphometric parameters have been found very active for erosion activity in the hilly sub-watersheds. Drainage texture ratio, form factor, drainage density, relative relief were found most influencing factors for erosion risk in the watershed. Numerous wetlands experienced deterioration during pre monsoon season. High ground water potential zones were found in those parts of the watershed where slope was gentle and surface water was available. Post monsoon growth of vegetation in forest was higher than the pre monsoon season due to rainfall variability. Some area of the forest was converted to non vegetation for *Jhum* cultivation in hilly slopes during pre monsoon season. Land suitability assessment was carried out for paddy and tea cultivation. Nearly 70 % and 63 % area was found suitable for paddy and tea cultivation respectively.

Integrated watershed management strategies were suggested for sustainable development of natural resources in the watershed based on the findings of the study.