Application of Hyperspectral Remote Sensing in Sambhar Salt Lake, A Ramsar Site of Rajasthan, India

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Abstract : Sambhar lake is the largest inland Salt Lake of India, declared as a Ramsar site on 23 March 1990. Due to high salinity and alkalinity condition its biodiversity richness is contributed by haloalkaliphilic flora and fauna along with the diverse land cover including waterbody, wetland, salt crust, saline soil, vegetation, scrub land and barren land which welcome large number of flamingos and other migratory birds for winter harboring. But with the gradual increase in the irrational salt extraction activities, the ecological diversity is at stake. There is an urgent need to assess the ecosystem. Advanced technology like remote sensing and GIS has enabled to look into the past, compare with the present for the future planning and management of the natural resources in a judicious way. This paper is a research work intended to present a vegetation in typical inland lake environment of Sambhar wetland using satellite data of NASA's EO-1 Hyperion sensor launched in November 2000. With the spectral range of 0.4 to 2.5 micrometer at approximately 10nm spectral resolution with 242 bands 30m spatial resolution and 705km orbit was used to produce a vegetation map for a portion of the wetland. The vegetation map was tested for classification accuracy with a pre-existing detailed GIS wetland vegetation database. Though the accuracy varied greatly for different classes the algal communities were successfully identified which are the major sources of food for flamingo. The results from this study have practical implications for uses of spaceborne hyperspectral image data that are now becoming available. Practical limitations of using these satellite data for wetland vegetation mapping include inadequate spatial resolution, complexity of image processing procedures, and lack of stereo viewing.

Keywords : Algal community, NASA's EO-1 Hyperion, salt-tolerant species, wetland vegetation mapping
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