

ENVIRONMENTAL CHANGES OF KAKINADA BAY DUE TO AQUACULTURE: A REMOTE SENSING BASED STUDY

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In recent years, aquaculture has grown in many folds in coastal Andhra of Indian subcontinent, resulting in the conversion of agriculture fields in to aquafarms. This will have adverse affect on soil fertility and agricultural productivity due to increase of saline compounds. In view of the impacts of land based activities like the formation of aquaculture ponds, river basin development activities and other natural and man made processes, a comprehensive study is conducted on environmental changes of a part of east coast of India using remote sensing. Environmental changes are evaluated based on the study of temporal variations of land use/land cover of the area and its environs due to aquaculture. The area considered for this study is Kakinada Bay and its surroundings of Andhra Pradesh, which has become an ecologically sensitive habitat where shrimp farming has taken, place. The specific objectives are: a) To study and determine the changes of physical characteristics of Kakinada Bay and its environs with special reference to the developmental activities of aquaculture using Indian remote sensing satellite data and b) To prepare the change detection map using overlay concept of Arc/Info GIS software showing the environmental changes. Digital data sets for two years, 1989 and 1999 are created using the satellite data derived from IRS 1B LISS II and IRS LISS III sensing systems. Both the data sets are registered geometrically using ENVI image processing software. These data sets are enhanced using different image filtering techniques. The environmental changes are evaluated by preparing the change detection map using supervised classification method of remotely sensed digital images. The decadal change in land use / land cover patterns is derived from the analysis of 1989 and 1999 classified images in the form of a map showing its spatial distribution. The cursory examination of this map indicates that shrimp aquaculture has contributed to the overall degradation of coastal environment in the last decade and is responsible for some 80 percent of mangrove conversions. In addition to the conversion of mangroves, shrimp aquaculture contributed to a number of other environmental and social conflicts. When shrimp farmers gain more experience with the prevention of the white spot disease, the number of shrimp farms may further increase and effective enforcement will be critical in avoiding further conflicts.