Somnath Mahapatra et al., Int J Earth Sci Geol. 2018
http://dx.doi.org/10.18689/2642-1569.a1.002

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International Conference on
Geology & Earth Science
May 2-4, 2018 Rome, Italy

Climate Change Risk Analysis for Vishakhapatnam, A Port City in the Eastern Coast of India, using Geoinformatics Technology

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"Geoinformatics" is an interdisciplinary branch, encompassing the latest technologies with the most dynamic & innovative tool for mapping, monitoring, modelling, assessment and defensible management of various environmental issues and natural resources by its specific capabilities and cost effectiveness. It basically utilizes an integration of Remote Sensing (RS), Geographical Information System (GIS), and Global Positioning System (GPS) & also Information Communication Technology (ICT) and other social interactions. Through Geoinformatics, we can study the Earth's environment as well as its changing trends over the years. This technology can play a vital role in monitoring the land use & land cover (LU/LC) over a particular region and can help to estimate the LU/LC changes over the years, using spatio-temporal data. In this study, the LU/LC change analysis has been done for Vishakhapatnam port (and its neighbourhood), situated in the Eastern coast of India, over a period of 30 years, with 4 time slots (1988, 1997, 2009 & 2017) during 1988-2017. LU/LC variation due to several features, like human settlement, forest cover, water bodies, vegetation, fallow land, sediments etc. in the coastal areas of Vishakhapatnam & nearby regions have been estimated for the above years (1988, 1997, 2009 & 2017) using USGS data and specific software. This study wished to delineate the flood risk assessment at Visakhapatnam port using Geoinformatics technology and satellite imageries. Shoreline changes and sea level rise in the coastal areas of Vishakhapatnam during the above period have been studied, as these are important for flood risk assessment over the vulnerable areas. From the analysis of sea level rise, it was inferred that the sea level has increased and the shoreline has deviated over the years. By the help of flood mapping through Remote Sensing and GIS, it can be inferred that the Visakhapatnam port areas have been highly prone to flood during recent times. Vishakhapatnam experienced Hud-Hud cyclone in October 2014 and also flood conditions (due to heavy rainfall) in September 2016. These severe events affected the port as well as city areas and there were loss of life and huge damage to properties. These raised the need to address flood related problems through scientific planning, based on studies and detailed researches on extreme weather events and climate change impacts over flood prone areas for formulating possible mitigation measures. In the present study, flood risk assessment shows that a major part of Visakhapatnam port areas fall under medium to high risk zone. Hence, proper coastal management is required for this port.

Biography:

Somnath Mahapatra is a senior **Scientist**, associated with **Monsoon Mission** program and the International CLIVAR Monsoon Project Office (**ICMPO**) at **IITM** (Indian Institute of Tropical Meteorology), Pune, India. His area of interest includes Numerical Weather Prediction, air-sea interactions, coupled ocean-atmosphere dynamical modelling, climate variability & change, etc. and he published papers in these fields. He contributed for implementation of Monsoon Mission program for improving prediction skill of Indian Monsoon by a coupled dynamical model. He has been active in various activities of Indian Meteorological Society. He is an adjunct faculty of DASS, S. P. Pune University for teaching their post-graduate students. He guided several post graduate students for internship training & project works. He has participated & organized several National & International events (Symposia/ Conferences/ Workshops/meetings/ trainings) at IITM, Pune. He likes to share his knowledge through Science popularization and outreach programs.