National Institute of Technology Rourkela

Registration Seminar

Seminar Title	: Investigating the Role of Land Use Land Cover Changes in the Extreme Rainfall Events over India
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Supervisor	: Dr. Nagaraju Chilukoti
Venue	: ER 303 Class Room
Date and Time	: 17 Oct 2024 (04:00)
Abstract	: Land use and land cover change (LULCC) is one of the most important forcings affecting the climate in the past century. Human activities over the last three centuries had a significant impact on Earth's environment. While the effect of greenhouse gases has been comprehensively studied, the effects of human-induced LULCC are still elusive (Pitman et al., 2009 Boone et al., 2016 Sy et al., 2017). LULCC plays a vital role in surface energy, momentum, heat, water, and biogeochemical balances. It affects regional weather and climate through impacts on the surface albedo, surface roughness, and other vegetation and soil properties, as well as the partitioning of available energy between latent and sensible heat and partitioning of rainfall between evaporation and runoff. LULCC plays a significant role in modulating the rainfall in space and time, particularly in tropical regions, due to complex interactions. While many studies have thoroughly documented rainfall patterns and their influencing factors over the Indian region, less focused on the role of LULCC in modulating those events, more research is needed to understand the diverse nature of extreme rainfall characteristics. One of the reasons for this varying nature of extreme rainfall events is largely due to India's diverse geographical and surface characteristics and how they are evaluated over time. Few studies have emphasized the impact of land use and land cover changes on regional climate and weather patterns. Although researchers have focused on how urbanization affects surface conditions and their variations, less attention has been given to how different types of land use cover influence regional weather and climate. Land, being a finite resource with its evolving surface properties over time due to human activities, requires wise utilization for sustainable development and also needs proper maintenance of land surface with robust land policy to reduce the regional vulnerability to weather extremities during the climate change epoch. This study aims to address the role of land use land cover changes in the accounting and documentation of extreme rainfall events and its associated dynamical and physical characteristics of rainfall over India with the help of numerical weather predictions using high-resolution regional models by thoroughly evaluating. Based on the above literature and research gaps, the following thesis objectives are proposed.