
Registration Seminar

Seminar Title	: Integrated Modelling and Management of Climate Change-Induced Compound Floods in Coastal Areas of Mahanadi River Delta
Speaker	: Debabrata Mishra (Rollno : 522ce1003)
Supervisor	: Dr. Ratnakar Swain
Venue	: Seminar Hall, Department of Civil Engineering (CE)
Date and Time	: 23 Apr 2024 (04.00PM)
Abstract	: This study focuses on the Mahanadi River Delta (MRD) coastline, a highly populated coastal region in India where yearly changes cause significant land loss and community relocations. Analyzing cyclonic events during the last 25 years, the study emphasizes the importance of careful risk assessment due to the region's high population density. The study anticipates future shoreline dynamics along the 123.1-kilometer coastline, divided into five Littoral cells (LC-A, LC-B, LC-C, LC-D, and LC-E) with 23,239 transacts. Landsat satellite images from 1990 to 2020, together with Linear Regression Rate (LRR) and End Point Rate (EPR) techniques, are used to estimate the rate of shoreline shifting. Vulnerable sites undergoing erosion and accretion have been observed throughout LC-A to LC-E, with Bhitarkanika in LC-E and Saralikud in LC-D suffering maximum erosion and accretion, respectively. Validation using RMSE mapping demonstrates that EPR is a more reliable forecast for 2020. Using EPR, the study predicts that around 65% of the shoreline will be threatened with erosion by 2040, and 37% of coastal mouzas will be very vulnerable to erosion. Beyond geographical concerns, a risk assessment includes the entire coastal population, female population, and Number of households, to prepare a future erosion risk map for 2040. A composite risk map is also prepared to access the erosion risk level on the coastal mouzas using the calculated erosion risk level and the village-wise population density data set. On-site investigation confirms the integrity of significant erosion and accretion sites, offering light on underlying causes. The study finishes by reviewing existing adaptation techniques and suggesting prescriptive measures for crucial MRD areas, encouraging proactive fortification against the relentless forces determining the fate of the MRD coastline.