

Preface

The Indian coastal region is prone to frequent tropical cyclones, which cause significant changes in the environment and impact various sectors of the economy. These cyclones frequently come with high winds, rain, and storm surges, which causes coastal erosion, floods, and harm to infrastructure and way of life. Accurate and timely detection of changes caused by tropical cyclones is essential for effective disaster management and mitigation measures. In recent years, The use of the technology of remote sensing has become increasingly important for tracking and evaluating the effects of tropical cyclones. The two cyclones Amphan and Fani that struck the Indian coast and the utilisation of Sentinel 1 & Sentinel 2 are the main topics of this introduction. SAR GRD satellites for detecting changes caused by these cyclones. Sentinel 2 satellite, with its multispectral and high-resolution imagery, is used to derive indices like NDVI and NDWI, which help in assessing vegetation health and water content. These indices provide valuable information on the extent of damage to crops and vegetation due to cyclones, and aid in prioritizing relief measures. Using machine learning algorithms like Random Forest and SVM (Support Vector Machine) classifiers, land use and land cover (LULC) maps are created using the Sentinel 1 SAR GRD satellite's all-weather and day-night imaging capability. These maps help in identifying the areas most vulnerable to cyclones and the impacts of cyclones on different land cover types.

Finally, Sentinel 1 SAR GRD is also used for detecting and preparing flood maps, which help in identifying the areas at risk of flooding due to cyclones. These maps are useful for planning evacuations along with additional flood management strategies. Through the use of these satellite technologies and analysis methods, it is possible to accurately detect and monitor changes caused by tropical cyclones over the Indian coastal region. Such information can be used to inform disaster management strategies and minimize the impacts of future cyclone