Preface

Bangladesh and India jointly own the Sundarbans, a UNESCO World Heritage Site near the Bay of Bengal delta that is home to the biggest mangrove forest in the world. This special ecosystem offers vital functions including carbon sequestration, coastal protection, and livelihood assistance for nearby residents, in addition to housing a wide variety of species, including the famous Bengal tiger. On the other hand, the Sundarbans are severely threatened by both natural and man-made factors, including as illegal logging, deforestation, land conversion, sea level rise, and climate change-induced storms that result in decreasing canopy density and significant forest fragmentation. The survival of this vital habitat and its biological balance are threatened by these issues.

An in-depth knowledge of the spatial dynamics of forest degradation in the Sundarbans is essential to the development of successful forest management plans. The monitoring and evaluation of these changes is done through the use of integrated spatial analysis, which combines GIS, remote sensing, and sophisticated modeling methods. We intend to present a thorough picture of the forest's current condition and forecast future trends by examining high-resolution satellite data, geographical measurements, canopy density models, and using linear regression analysis. Interpreting changes in land cover also benefits from an analysis of deforestation and afforestation patterns. This important ecosystem will be managed sustainably thanks to the insights acquired, which will guide the development of more effective conservation policies.