

PREFACE

Globally, there is a serious threat to both human safety and environmental sustainability due to the increasing frequency and severity of forest fires. In regions such as the Nainital district of Uttarakhand, India, the complex interplay of topographical, climatic, and anthropogenic factors necessitates advanced methods for understanding and managing forest fire dynamics. This research paper delves into the application of geospatial technologies, specifically leveraging Google Earth Engine (GEE), to enhance our comprehension of forest fire patterns and behaviours in this critical region.

The core objective of this study is to employ a geospatial approach to analyse and predict forest fire occurrences, integrating the Analytical Hierarchy Process (AHP) and weighted overlay techniques to refine the analysis. By utilizing GEE, a powerful cloud-based geospatial processing platform, we can process vast amounts of satellite imagery and environmental data to develop precise, scalable, and efficient models of forest fire dynamics.

This research is particularly pertinent in the context of Nainital, a district characterized by its diverse terrain and rich biodiversity, making it both susceptible to fires and crucial to preserve. The integration of AHP allows for a systematic decision-making process that considers multiple criteria affecting fire susceptibility. The weighted overlay method further enhances the model by assigning appropriate significance to these factors based on empirical data and expert judgment.

Our findings aim to contribute to the body of knowledge in forest fire management, providing valuable insights for policymakers, forest managers, and local communities. By improving the predictive capabilities and understanding of fire dynamics, this research aspires to aid in the development of more effective fire prevention, preparedness, and mitigation strategies.