

# **Impact Deforestation on Land Surface Temperature: A Case Study Highland Kundasang, Sabah**

## **ABSTRACT**

In recent decades, extensive deforestation in tropical regions has dynamically reshaped forests and land cover. Driven by demands for intensified agriculture, rural settlement expansion, and urban growth, this transformation underscores the need for vigilant monitoring of vegetation and forest cover to comprehend global and local environmental shifts. This study focuses on the intricate interplay between deforestation and its impact on land surface temperature (LST) within Sabah's Kundasang highland. Analyzing years 1990, 2009, and 2021, the study employs Landsat 5 and Landsat 8 satellite data spanning three decades to decipher forest cover dynamics. Utilizing remote sensing techniques, it unveils the evolving relationship between deforestation, forest cover, and LST fluctuations, validated using Moderate Resolution Imaging Spectroradiometer (MODIS) insights from 1990 to 2021. Motivated by the scarcity of research on tropical deforestation's LST impact, the study's core aim is to establish a robust link between forest loss extent and ensuing thermal changes. The findings highlight a tangible influence of reduced vegetation on rising surface temperatures, necessitating a precise understanding of deforested areas and their thermal responses. Revealing a striking scenario, around 76% of Kundasang highland's forest cover transformed into agriculture and urban zones over 27 years. The study further uncovers a clear inverse relationship between LST and forest area in square kilometres, as well as the Normalized Difference Vegetation Index (NDVI). These findings provide valuable guidance for forest management, identifying vulnerable areas, while also empowering local governance to shape sustainable land management strategies.