Severity Classification of the Forest Fired Area by Utilizing Remote Sensing and GIS: A Case Study in Ella Sri Lanka

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The burning of forest areas in Sri Lanka can be considered as one of the foremost issues that should be addressed. Human influence could be identified as the major cause of forest fires in Sri Lanka. Hence, identification, mapping, and taking necessary actions for forest fires are vital in the current context. The forest fire that occurred in the Ella area in 2019 was the focus of the case study. First, the burned location identification was the crucial part of the study due to the unavailability of a proper database of forest fires in Sri Lanka. Hence, with the use of newspaper articles and reports, the forest-fire area was identified at the beginning. Then by utilizing Sentinel-2 satellite images through the Normalized Burn Ratio (NBR) forest fire area was identified. Further, with occupying the difference of NBR (dNBR) mapped the severity of the fire by following the United States Geological Survey (USGS) fire classification scheme. The analysis was performed in Quantum GIS (QGIS) open-source software platform since the Semi-automatic Classification Plugin (SCP) provided the best framework for analysis. Even if immediate satellite images just after the incident were not present, mainly due to the cloud coverage, the analysis was able to obtain a considerable output. Consequently, owing to the study, 73.82 hectares of areas were identified as burned due to the wildfire and 15.65% of the area was highlighted as a high severity of the burn. In conclusion, the applied methodology could be used by any organization for forest scare mapping, and it is vital in future planning.

Keywords: *dNBR, forest fire, GIS, NBR, QGIS, remote sensing*