Managing hazards in snow covered Himalayas

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Abstract: The potential of the satellite based remote sensing has been demonstrated in many applications. The remotely sensed data together with selective field observations can play a crucial role in the study of snow avalanches and crevasses in inaccessible and rugged terrains in the Himalayas. The hazard potential of snow avalanches is of paramount concern in high mountain areas with dense population. In this paper, an attempt is made to delineate the avalanche probable sites using Statistical and Heuristic approach. The methodology for optical remotely sensed data over rugged mountainous terrain of Himalayas encompasses the ortho-rectification to derive accurate location, the atmospheric correction to compute improved ground reflectance image and density slicing to demarcate the snowline using ratio of SWIR band and Red band. The microwave remotely sensed data is also attempted to discriminate between snow and rocky surface using normalized standard deviation and map the crevasses using the combination of texture measures (contrast, entropy and correlation).

The analysis shows the efficacy of remotely sensed data in an optical and microwave range from the existing and future satellites in managing the hazards in snow covered Himalayas.

Keywords: Microwave, Texture Analysis, Equilibrium line, Snow Avalanches and Crevasses.