Abstract

Accurate and timely estimation of the spatiotemporal surface dynamics is very important for natural resource planning and disaster mitigation. This paper discusses a novel technique to assess the patterns of the surfaces of a particular severe landslide susceptible zone (Kullu-Larji-Rampur geological window, near Aut village, district Mandi, Himachal Pradesh, India; N 31°44'34.78'' E 77°12'29.02''). The spatiotemporal surface dynamics of this region, spanning over last 20 years (1989 - 2009), has been modelled using Landsat TM images acquired during summers of 1989, 2000 and 2009. The proposed technique uses image processing to derive regression models of selected area segments, these models are then used to measure area under the curve to estimate the surface area changes. The surface area changes thus obtained have also been validated by standard method of pixel counting. Principal component analysis has been done in order to understand the correlations amongst the estimated parameters, namely; segment lengths, percentage area change and the area change in the first (1989-2000) and second (2000-2009) decades. The results obtained show a fair degree of accuracy as compared to the standard method of pixel counting.
References


Index Terms

Computer Science

Image Processing
Keywords
Digital Change detection  Himalayas  Landsat  Landslides  Remote sensing  Spatiotemporal