

A multi-sensor approach for desertification monitoring in the coastal areas of Vietnam

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Abstract

Vietnam is not designated as an arid or semi-arid country. However, some regions within the country are at risk from desertification. Of the 3.2 million hectares of coastal areas in Vietnam, 1.6 million are heavily affected by soil degradation and desertification. This paper explored the use of multi-sensor approach to monitor semi-arid area of Vietnam.

Data from optical system like ASTER and MODIS is employ to observe soil and vegetation at both large and small scale. Thermal band of ASTER is use to extract surface temperature data.

ENVISAT ASAR (Advance Synthetic Aperture Radar) is use to estimate soil moisture following a data fusion approach. In this approach, the difference between dry and wet season SAR backscatter will be utilized to normalize roughness effects; and surface reflectance in optical wavelengths will be used(ASTER) to account for differences in vegetation density.

Finally the relationship between vegetation density, soil moisture, surface temperature - and the role of those parameter with desertification process were investigated. Base on this result, we develop a method to map the areas at risk of desertification, which can be used as a basis for forecasting and planning.