

ESTIMATING WATER USE FOR A RICE CROP IN PHU YEN PROVINCE BY REMOTE SENSING AND GIS TECHNIQUES

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ABSTRACT

Crop water requirements and irrigation scheduling are important in agricultural production. Recently, the water footprint model has been used to determine crop water use effectively, in which the total water-required volume, including surface and groundwater (WFBlue), precipitation (WFGreen), and fresh water to assimilate pollutants (WFGrey), is computed based on weather condition, land cover, and topography in the study area. This study applies the water footprint to estimate the water use for a rice crop in Phu Yen Province, and input data are collected from December 2015 to April 2016. The input data consist of in-situ measurements from meteorological stations, ASTER GDEM and Landsat 8 images. The meteorological measurements, including air temperature, humidity, wind speed, hours of solar radiation, and precipitation, are used to determine the reference crop evapotranspiration in combination with the topographical factors derived from ASTER GDEM. INDVIs, derived from Landsat 8 images, corresponding to rice growing periods, are used to determine crop factors. A data processing for estimation on rice crop water use is designed in the ArcGIS Model Builder. The results indicate that water use for a rice crop has different patterns in the whole Phu Yen province, and for yielding one ton of rice, the total required water equals approximate 2400 m³.

RIVERBANK CHANGE DETECTION IN THE DOWNSTREAM OF BA/DA RANG RIVER IN PHU YEN PROVINCE BY REMOTE SENSING

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ABSTRACT

The downstream of Ba/Da Rang River is important in the socio-economic development of Phu Yen province in general and Tuy Hoa City in particular. This paper presents the results of the extraction and assessment of changes in river bank of Ba/Da Rang river of Phu Yen province by remote sensing and GIS. Multi-temporal remote sensing data, natural conditions data and hydro-meteorology data in the downstream of Ba/Da Rang river are used to support the analysis and extraction of river bank of different periods. The results show that accretion and erosion in this area are complicated by the influence of many natural factors and human activities. The results give the authorities a scientific basis to give orientations, policies and action plans to minimize losses due to the change of river bank.