REMOTE SENSING APPLICATION FOR RICE IRRIGATION ASSESSMENT: PRELIMINAR STUDY ON BAIXO MONDEGO AND LIS VALLEY IRRIGATION DISTRICTS, PORTUGAL

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Abstract: This study aims to analyse the practical capabilities of available satellite data to assess the rice crop development and productivity, by supporting irrigation and cultivation decisions, namely the nitrogen distribution. At first, the Normalized Difference Vegetation Index (NDVI) is applied, and latter other indexes will be also used, especially those exploiting the usefulness of the red-egde bands of the Copernicus Sentinel-2 data. These indexes will be calculated using the BOA (Bottom Of Atmosphere) Sentinel-2 orthoimages to minimize the effect of the atmosphere and the different solar illumination along the year, determining the average NDVI for the whole parcel area, as well as for punctual assessments. It allows the comparison with handheld field scale measurements collected using a portable spectroradiometer. This preliminary study using 2017 and 2018 Sentinel-2 data, was applied to one parcel of Lis Valley and to two parcels of Quinta do Canal, in Baixo Mondego. The NDVI evolution revealed to be similar in the three experimental parcels, following the normal rice development. The correlation yield-NDVI will be analysed. Concluding, the satellite images allowed to provide useful NDVI rice data during crop season, being a good indicator of the crop growth with potential to have a strong correlation with yield and nitrogen doses. This knowledge might contribute to a fast spacial diagnosis of crop problems, aiding farmers towards a precision cultivation and irrigation management.

Keywords: Irrigation water management, rice crops, Sentinel-2, NDVI, MEDWATERICE

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