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Assessing water scarcity in Malaysia: a case study of rice production

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ABSTRACT

Recent years have seen a surge of interest in assessing water withdrawal in the agricultural sector which has been experiencing an increasing concern with sustainable environmental requirements. Like other highly water-intensive crops, rice production systems rely on an ample water supply, thus posing a serious threat to water availability. This study estimates the water use of rice cultivated in the off- and main seasons in Malaysia. The water withdrawal of rice was estimated based on the monthly climatic data of 30 y (1983–2013) and a 10-y (2002–2011) average annual crop yield. The water stress index (WSI) of the 16 major watersheds in Malaysia was also derived to assess the water deprivation. We found that the blue water use for rice cultivation in the off- and main seasons ranges between 619 and 1,421 m^3/t and 504 and 1,031 m^3/t, respectively. The results also showed that the average WSI for 11 states in Peninsular Malaysia is 0.08 with a total water deprivation of 97 million m^3H_2O eq/y. This study can serve as baseline information for the government in identifying the areas that need to be conserved and the recommendations that should be drawn toward sustainable management of water resources in Malaysia.

Keywords: Water consumption; Water footprint; Water stress index; Water resources; Water management; Water withdrawal; Malaysia

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