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Abstract : The Cheliff–Zahrez plains in Algeria are known for their fertility and agricultural production. The water deficit of the last decade has had a negative impact on agricultural production due to the scarcity of surface and underground supply resources. This paper sheds light on the weather, drought risk concerning crop irrigation in wheat yield cases. The methodology was the standardized precipitation index, which helps to identify a drought risk assessment model based on moderate frequency maps carried out by the geographic information system. Over the study area, 65 rainfall stations are considered, each with 41-year measurement period (1970/2010). According to the results, this basin has generally periods of humidity and drought with a tendency towards drought. The spatial distribution analyses of drought incidence in the derived Cheliff–Zahrez Basin (standardized precipitation index) and annual rainfall have shown that since 1970, the basin has experienced below-average rainfall, particularly in the central and northern regions. Various maps from 1970 to 2010 show that the basin is characterized by high spatial variability in rainfall from one station to another with the north and northeast sub-basins being much more sensitive to agricultural drought. Generally, the sub-basin in the western zone has a moderate vulnerability. The southern zone is characterized by moderate drought (less frequent in the basin). The drought hazard index map from 1970 to 2010 showed that the moderate and severe drought classes cover an area of 93.34% and 3.66%, respectively, with drought occurrence probabilities of 15 to 22.5% and 22.5 to 30%. The correlation is significant in the order of 70% to 75% between dry spells and wheat production.

Keywords : SPI index ; DHI ; Rain-fed wheat ; Yield ; Mapping ; Arid (semi-)basin

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1-https://link.springer.com/article/10.1007/s12517-021-07401-y

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