Assessing past and future drought vulnerability index over Khorasan-razavi province, Iran

Iman Babaeian [1], Atefeh Erfani [2], Alireza Entezari [3], Mohammad Baaghideh[3], Mohammad Bannayan[4]

[1]*Assistant Professor, ASMERC, Climate Research Institute, Mashhad, Iran*
[2]*Ph.D. in Climatology, Mashhad, Iran*
[3] *Faculty of Geography and Environmental Science, Hakim Sabzevari University, Sabzevar, Iran*
[4] *Faculty of Agriculture, Ferdowsi University of Mashhad, Mashhad,Iran*

Abstract

Recent past and future drought vulnerability of Khorasan-razavi which is located in the northeast of Iran has been simulated in this research. Economy of Khorasan-razavi is highly dependent to agriculture sector, in this regard, better understanding of drought vulnerability is vital for agriculture society of the province. Drought Vulnerability Index (DVI) consist of three components of Exposure (E), Sensitivity(S) and Adaptive Capacity(AC). To estimate exposure, meteorological variables are used. National socio-economic census data such as per capita income, percentage of social security insurance, number of medical centers and hospital beds, available water resources, area under agriculture, rangeland, literate people, number of industrial centers, employment percentage, percentage of vulnerable people and so on are used to estimate sensitivity and adaptive capacity of each county in the province in the recent past period of 1986-2005. Then we estimated future drought vulnerability of each county using statistically downscaled CMIP5 GCMs of CanESM, GFDL and CNRM under RCP4.5 and RCP8.5 scenarios during 2021-2100. Results showed that the category of "low vulnerability" will be disappeared and new class of "very high vulnerability" will be appeared in the future period of 2081-2100 over study region.

Keywords: Drought, Vulnerability, Khorasan-razavi, Global Warming, CMIP5