



Assessing and Mapping Drought Vulnerability in Agricultural Systems – A case Study for Slovenia

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Drought is a recurrent meteorological phenomenon. During recent years there is a rising concern about the increasing frequency of droughts and the ecological, economic and social aspects of their impact, especially because of the possible correlations between droughts and climate change. In the past decade there were four severe agricultural droughts on the territory of Slovenia, which resulted in the damage of most of non-irrigated crops and considerable economic loss. To minimize the impact of such phenomena it is necessary to conduct a drought vulnerability assessment, which could help developing mitigation and adaptation strategies. Development of drought adaptation strategies is one of the core tasks of the Drought Management Centre for South-eastern Europe (DMCSEE). As a part of DMCSEE activities, we started with the pilot project for drought vulnerability assessment for Goriška region in the western part of Slovenia in 2008 with the objective to identify principal impacts of drought and to develop a methodology for drought vulnerability assessment in agriculture. In 2009, we extended the vulnerability assessment area from our pilot region to the entire area of Slovenia.

The significance of drought impact on agriculture was evaluated on a five-grade scale based on a number of criteria, which were used according to the availability of the data. We have used the available digital data for soil water-holding capacity, slope, solar radiation, land use and irrigation infrastructure. Vulnerability distributions were arranged according to administrative units - Graphical Units of Agricultural Land (GERK). In the present study, the evaluation grades were assigned subjectively, however, we are introducing objective tools and models to improve the evaluation. In the case of the assessment of the vulnerability of land use for certain types of crops in a specific GERK, we are using an irrigation scheduling model IRRFIB, which estimates water consumption by crops during their growing and ripening season. Geographical mapping was performed using Geographic Information System (GIS) software, which provides graphical presentation of the exposure of particular geographic areas to drought with spatial resolution of 100m in both longitude and latitude.

The reliability of our vulnerability assessment model was checked through comparisons of its predictions to the data on agricultural damage in 2006, which were in good agreement.

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