



## Impact of climate change on agricultural production in Hungary

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Climate change may significantly alter agricultural productivity which could directly affect economy and food security. Agriculture related impact studies are of great importance for mitigating the negative effects of climate change. Reliable regional climate model (RCM) based scenarios are essential data sources for the estimations of the potential effects of the changing climate. However, every climate model suffers from systematic errors (e.g. under- or overestimation the amount and frequency of precipitation), which may prevent direct application of the RCM results for agricultural purposes. There are several bias correction strategies to correct those errors in the RCM datasets. Our main aim is to correct the available RCM results to prepare complex, agriculture-related impact studies for the Carpathian Basin. The overarching aim is to estimate the expected changes of agricultural productivity in Hungary.

In the present study eight RCM experiments are used that were created and disseminated within the framework of the ENSEMBLES FP6 project. After statistical bias correction the daily data is used to drive the 4Mx crop simulation model developed by the Research Institute for Soil Science and Agricultural Chemistry of the Hungarian Academy of Sciences. 4Mx is a daily-step, deterministic model that simulates the water and nutrient balance of the soil, the soil-plant interactions as well as the plant development and growth. 4Mx model is tested at western Hungary, in the region of Hegyhátsál (Vas County) where other, agriculture related research activities are also present. The simulated crop production values will be compared with average yield datasets in county level, based on the records of the Hungarian Central Statistical Office. In the present study the effect of bias correction on the climate scenarios as well as on selected crop simulation results is demonstrated.