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How could Mosan agriculture be impacted by climate change and future droughts ?

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Despite the great uncertainties regarding the future climatic context, lots of studies have focused on hydrological effects of climate change on the Meuse catchment. It appears that both winter high flows and summer low flows could be exacerbated. Climate change and its impacts on hydrology will thus affect various socio-economic sectors. High flows have been widely studied compared to low-flows. This poster will put the emphasis on a methodology developed in order to study impacts of droughts on agriculture. Agriculture is among the most impacted sectors due to climate change. The consequences could be both positive as negative in accordance with the range of predicted changes and the adaptation capacity of agricultural systems.
Most of the existing studies related to climate change on agriculture focused on specific territory. Within the AMICE Interreg IVB project, a transnational approach has been developed to assess droughts impacts on agriculture through the Meuse basin. The project's previous works gave us a common scenario of climate trends and of the evolution of the hydrology in the Meuse basin.
The methodology is based on the use of a physically-based model able to simulate the water-soil-plant continuum (derived from EPIC model). In order to be transferable from one country to another, the methodology proposed used data available at the basin scale. The UE soil data base was complemented with local information on agricultural practices and statistics. Three crops have been studied: maize, wheat and barley. The basic cultural calendar is supposed to be the same for the different countries. The methodology developed permits to study the evolution of yields, leaf area index, crops stress due to excess or lack of water through time under different scenarios build up in the frame of the project.
It appears that corn is negatively affected by climate change, and thus despite the CO_2 fertilization effect. Wheat and barley have similar behavior and are positively affected by climate change and CO_2 fertilization. Leaf Area Index study reveals that the different crops start earlier and reach earlier maturity. These first results will be completed with other economic sectors'analysis like drinkable water production, electricity production and navigation. Therefore, the project will progress towards a better understanding of economic effects of future droughts and low-flows.