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Economic Drought Impact on Agriculture: analysis of all agricultural sectors affected

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The analysis of drought impacts is essential to define efficient and sustainable management and mitigation. In this paper we present a detailed analysis of the impacts of the 2004-2008 drought in the agricultural sector in the Ebro river basin (Spain). An econometric model is applied in order to determine the magnitude of the economic loss attributable to water scarcity. Both the direct impacts of drought on agricultural productivity and the indirect impacts of drought on agricultural employment and agroindustry in the Ebro basin are evaluated.
The econometric model measures losses in the economic value of irrigated and rainfed agricultural production, of agricultural employment and of Gross Value Added both from the agricultural sector and the agro-industrial sector. The explanatory variables include an index of water availability (reservoir storage levels for irrigated agriculture and accumulated rainfall for rainfed agriculture), a price index representative of the mix of crops grown in each region, and a time variable. The model allows for differentiating the impacts due to water scarcity from other sources of economic losses.
Results show how the impacts diminish as we approach the macro-economic indicators from those directly dependent on water abstractions and precipitation. Sectors directly dependent on water are the most affected with identifiable economic losses resulting from the lack of water. From the management perspective implications of these findings are key to develop mitigation measures to reduce drought risk exposure. These results suggest that more open agricultural markets, and wider and more flexible procurement strategies of the agro-industry reduces the socio-economic exposure to drought cycles.
This paper presents the results of research conducted under PREEMPT project (Policy relevant assessment of the socioeconomic effects of droughts and floods, ECHO - grant agreement # 070401/2010/579119/SUB/C4), which constitutes an effort to provide a comprehensive assessment of the socioeconomic impacts of the 2004-2008 drought in the Ebro river basin