LandCaRe-DSS – model based tools for irrigation management under climate change

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Climate change is expected to have a strong influence on agricultural systems in the future. It will be important for decision makers and stakeholders to assess the impact of climate change at the farm and regional level in order to facilitate and maintain a sustainable and profitable farming infrastructure. Climate change impact studies have to incorporate aspects of uncertainty and the underlying knowledge is constantly expanding and improving. Decision support systems (DSS) with flexible data bases are therefore a useful tool for management and planning: different models can be applied under varying boundary conditions within a conceptual framework and the results can be used e.g. to show the effects of climate change scenarios and different land management options.

Within this project, the already existing LandCaRe DSS will be further enhanced and improved. A first proto-type had been developed for two regions in eastern Germany, mainly to show the effects of climate change on yields, nutrient balances and farm economy. The new model version will be tested and applied for a region in north-western Germany (Landkreis Uelzen) where arable land makes up about 50% of overall land-use and where 80 % of the arable land is already irrigated. For local decision makers, it will be important to know how water demand and water availability are likely to change in the future: Is more water needed for irrigation? Is more water actually available for irrigation? Will the existing limits for ground water withdrawal be sufficient for farmers to irrigate their crops? How can the irrigation water demand be influenced by land management options like the use of different crops and varieties or different farming and irrigation techniques?

The main tasks of the project are (I) the integration of an improved irrigation model, (II) the development of a standardized interface to apply the DSS in different regions, (III) to optimize the graphical user interface, (IV) to transfer and apply the DSS in an example region in north-west Germany and (V) to expand the underlying data base of climate change models and scenarios.

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