



Future Groundwater Use in Ljubljana Field and Mura Valley (Slovenia)

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Ljubljana field is a part of Ljubljana basin in the central part of the country. Mura valley, in the north eastern part of the country, belongs to Mura basin. Both are important “storages” of groundwater and main source of drinking water for more than 380.000 inhabitants. In an unconfined porous Ljubljana field aquifer the thickness exceeds 100 m, the groundwater is recharging from rainfall (50 %) and from the river Sava (50 %). The three quarters of the aquifer lie beneath the urbanised and agricultural area. The Mura valley porous aquifer is shallower, the average thickness is 17 m, the groundwater is recharging mainly from precipitation and most of the aquifer lies beneath the agricultural area.

Ljubljana field and Mura valley were chosen as test areas in the project Climate Change and Impacts on Water Supply (CC-WaterS). The aim of the project is to estimate the impact of climate change on drinking water supply in the Alpine region, middle and lower Danube and Adriatic sea coastal areas. In Slovenia two test areas were chosen because different land uses require different anthropogenic activities which modify the entire aquifer areas, impact the hydrological balance, reduce the aquifer recharge, influence the groundwater flow characteristics, change the water source availability and restoration and influence the quality of groundwater.

For the two test areas, climate change scenarios were made on the basis of the SRES A1B emissions scenario on which three different models were used: ALADIN, RegCM3 and PROMES. Temperature and precipitation were modeled and ETP was calculated for the future periods 2021-2050 and 2071-2100.

Water use data were obtained from the local public companies for drinking water supply and for other water use from the water permits, since, especially in Mura valley, many people pump drinking water from private wells and therefore public companies’ data are not sufficient. Data sets from the public companies vary a lot, as for Ljubljana field the data sets of water use are available for the past 50 years, but only for a few past years for the Mura valley.

From the past water use data and most plausible climate change scenario, estimates of possible future water use in the test areas were made. It is expected that the water use in Mura valley will decrease after the most plausible scenario, because of diminishing trend of household’s water use due to emigration. The water use for industry and agriculture will most likely remain the same. In Ljubljana field, the scenario is contrary. The water use will increase, because of a higher use of water for households (immigration).