

Impact of climate change on evaluation of future water demand in the Euphrates and Aleppo basin, Syria

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Abstract Syria is one of the Middle Eastern countries that suffer from scarcity in water resources availability, which affects the growth and development of economic activities. In this research, the Water Evaluation and Planning (WEAP) model is applied to evaluate future water demand in the Euphrates and Aleppo basin (EAB), Syria, by taking into account the climate change that may affect water demand in the domestic, industrial, and agricultural sectors until 2050. The climate change projections of temperature and precipitation were assessed using a new version of the MAGICC/SCENGEN tool with two greenhouse gas emissions scenarios (A2 and B2) of the Intergovernmental Panel on Climate Change (IPCC). Based on the results of IPCC (A2, B2) scenarios projections, the EAB basin is likely to face a decrease in precipitation amount by 21% according to A2 and by 12% according to B2, while temperature would increase by about 2.5°C according to A2 and by 2°C according to B2. Within the three scenarios adopted in this research: (1) available technology development; (2) increasing treated wastewater in agriculture and industry sectors; (3) and two combined scenarios, the results of the simulation demonstrated that the proposed scenarios are effective for reducing stressors on EAB's water resources, but are not sustainable to bridge the gap between demand-supply by the year 2050, which leads to the deterioration of the available water resources.

Key words MAGICC/SCENGEN tool; water resources management; water demand; climate change; WEAP; Euphrates and Aleppo basin