EGU22-1826
https://doi.org/10.5194/egusphere-egu22-1826
EGU General Assembly 2022

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Sustainable water management is one of the sustainable development goals (SDGs) and is characterized by a high level of interdependencies with other SDGs from regional to global scales. Many water as[1]sessment studies are restricted to silo thinking, mostly focusing on water-related consequences, while lacking a quantification of trade-offs and synergies of economic, social, and environmental dimensions. To fill this knowledge gap, we propose a “nexus” approach that integrates a water supply constrained multi-regional input-output (mixed MRIO) model, scenario analysis, and multi-criteria decision analysis (MCDA) to quantify the trade-offs and synergies at the

sectoral level for the capital region of China, i.e. the Beijing-Tianjin-Hebei urban agglomeration. A total of 120 industrial transition scenarios includ[1]ing nine major industries with high water-intensities and water consumption under current development pathways were developed to facilitate the trade-off and synergy analysis between economic loss, social goals (here, the number of jobs) and environmental protection (with grey water footprint representing water pollution) triggered by water conservation measures. Our simulation results show that an imposi[1]tion of a tolerable water constraint (a necessary water consumption reduction for regional water stress level to move from severe to moderate) in the region would result in an average economic loss of 68.4 (± 16.0) billion Yuan (1 yuan ≈ 0.158 USD$ in 2012), or 1.3 % of regional GDP, a loss of 1.94 (± 0.18) million jobs (i.e. 3.5 % of the work force) and a reduction of 1.27 (± 0.40) billion m3 or about 2.2% of the regional grey water footprint. A tolerable water rationing in water-intensive sectors such as Agriculture, Food and tobacco processing, Electricity and heating power production and Chemicals would result in the lowest economic and job losses and the largest environmental benefits. Based on MCDA, we selected the 10 best scenarios with regard to their economic, social and environmental performances as references for guiding future water management and suggested industrial transition policies. This integrated approach could be a powerful policy support tool for 1) assessing trade-offs and synergies among multiple criteria and across multiple region-sectors under resource constraints; 2) quantifying the short-term supply-chain effects of different containment measures, and 3) facilitating more insightful evaluation of SDGs at the regional level so as to determine priorities for local governments and practitioners to achieve SDGs.