



Coupling cost-effectiveness analysis and robust decision making for selecting adaptation measures. Application to the Maipo River Basin, Chile.

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Future climate change scenarios threaten current practices in agriculture and therefore adaptation measures have been proposed to overcome this possible situation. To evaluate adaptation measures, cost-effectiveness analysis (CEA) has been implemented, especially in Europe, as a tool to rank them in terms of its efficiency. This research evaluates how the CEA could be complemented with Robust Decision Making (RDM) and implemented in other than European context: a Latin-American Mediterranean climatic zone in central Chile. The Water Evaluation and Planning (WEAP) model and the Plant Growth Model (PGM) were used to simulate weekly water distribution, daily consumption, annual yield and annual production of 20 crops in rural areas up to 2050. Three adaptation measures were evaluated under 15 climate scenarios and land use change based on observed trends: a) using all water rights (WR), b) reducing channel losses (CL), and c) irrigation improvement (II). Under current practices, crop water demands cannot be met for a third of considered future scenarios. If the adaptation measures were implemented independently, the third measure was the most efficient, conditioned just by the crop technology allowed, but also with the higher cost. A combination of measures in specific crops (WR+II) was the most cost-effective and robust choice, leading to crop water demand satisfaction under all future scenarios, but with a diminished yield (1%-14%) and production (8%-20%) in all cases.