



## **The Community Water Model (CWATM) / Development of a community driven global water model**

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With a growing population and economic development, it is expected that water demands will increase significantly in the future, especially in developing regions. At the same time, climate change is expected to alter spatial patterns of hydrological cycle and will have global, regional and local impacts on water availability. Thus, it is important to assess water supply, water demand and environmental needs over time to identify the populations and locations that will be most affected by these changes linked to water scarcity, droughts and floods. The Community Water Model (CWATM) will be designed for this purpose in that it includes an accounting of how future water demands will evolve in response to socioeconomic change and how water availability will change in response to climate. CWATM represents one of the new key elements of IIASA's Water program. It has been developed to work flexibly at both global and regional level at different spatial resolutions. The model is open source and community-driven to promote our work amongst the wider water community worldwide and is flexible enough linking to further planned developments such as water quality and hydro-economic modules.

CWATM will be a basis to develop a next-generation global hydro-economic modeling framework that represents the economic trade-offs among different water management options over a basin looking at water supply infrastructure and demand managements. The integrated modeling framework will consider water demand from agriculture, domestic, energy, industry and environment, investment needs to alleviate future water scarcity, and will provide a portfolio of economically optimal solutions for achieving future water management options under the Sustainable Development Goals (SDG) for example. In addition, it will be able to track the energy requirements associated with the water supply system e.g., pumping, desalination and interbasin transfer to realize the linkage with the water-energy economy.

In a bigger framework of nexus – water, energy, food, ecosystem - CWATM will be coupled to the existing IIASA models including the Integrated Assessment Model MESSAGE and the global land and ecosystem model GLOBIOM in order to realize an improved assessments of water-energy-food-ecosystem nexus and associated feedback.

Our vision for the short to medium term work is to introduce water quality (e.g., salinization in deltas and eutrophication associated with mega cities) into CWATM and to consider qualitative and quantitative measures of transboundary river and groundwater governance into an integrated modelling framework.