Integrated Assessment Model to assess socioeconomic pathways in the transition to a climate-resilient society

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LOCOMOTION Low-carbon society: An enhanced modelling tool for the transition to sustainability

1. Introduction

Europe and the world are facing a global climate crisis affecting environmental systems and society. Citizens are demanding change, while civil society and policymakers are seeking sustainable alternatives for a low-carbon, and less resource use intensity future. These challenges raise fundamental questions about the underlying assumptions that have been steering society and development.

2. WILIAM model

The project LOCOMOTION (www.locomotion-h2020.eu) aims to design a new Integrated Assessment Model (IAM) – WILIAM - to provide policymakers and relevant stakeholders with a reliable and practical modelling system to assess the feasibility, effectiveness, costs, and ramifications of different sustainability policy options. The project will help to identify effective transition pathways toward a low-carbon society in three future socioeconomic scenarios, Green Deal, Green Growth and Postgrowth.

The new approach includes an Environmental module covering the Land, Water and a Climate submodule. The model relates water availability with land use, for six submodules related to Land.
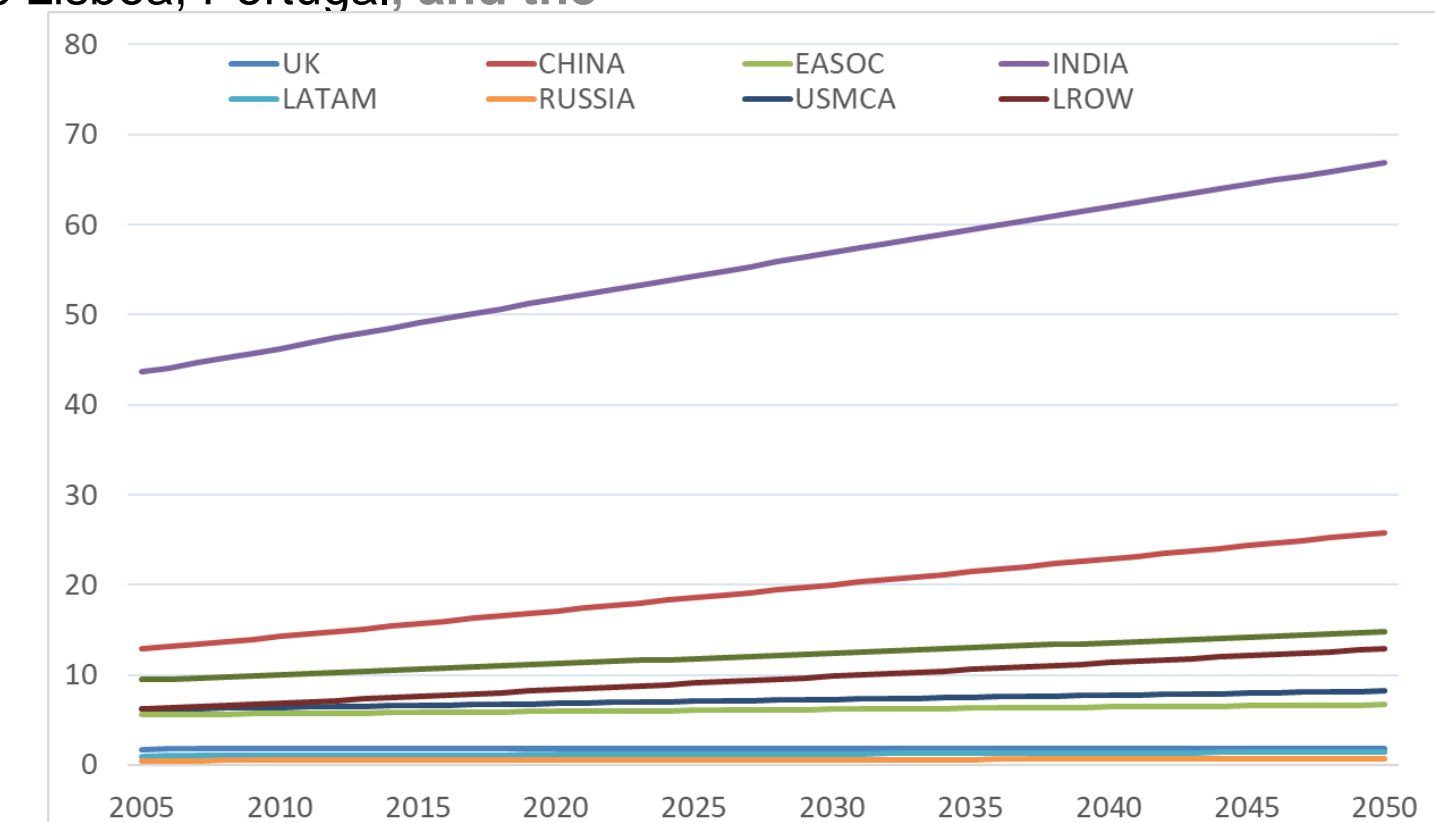
The water module is divided into two components: demand and availability. The demand includes the use of water by economic sectors and households (**Fig. 1**).
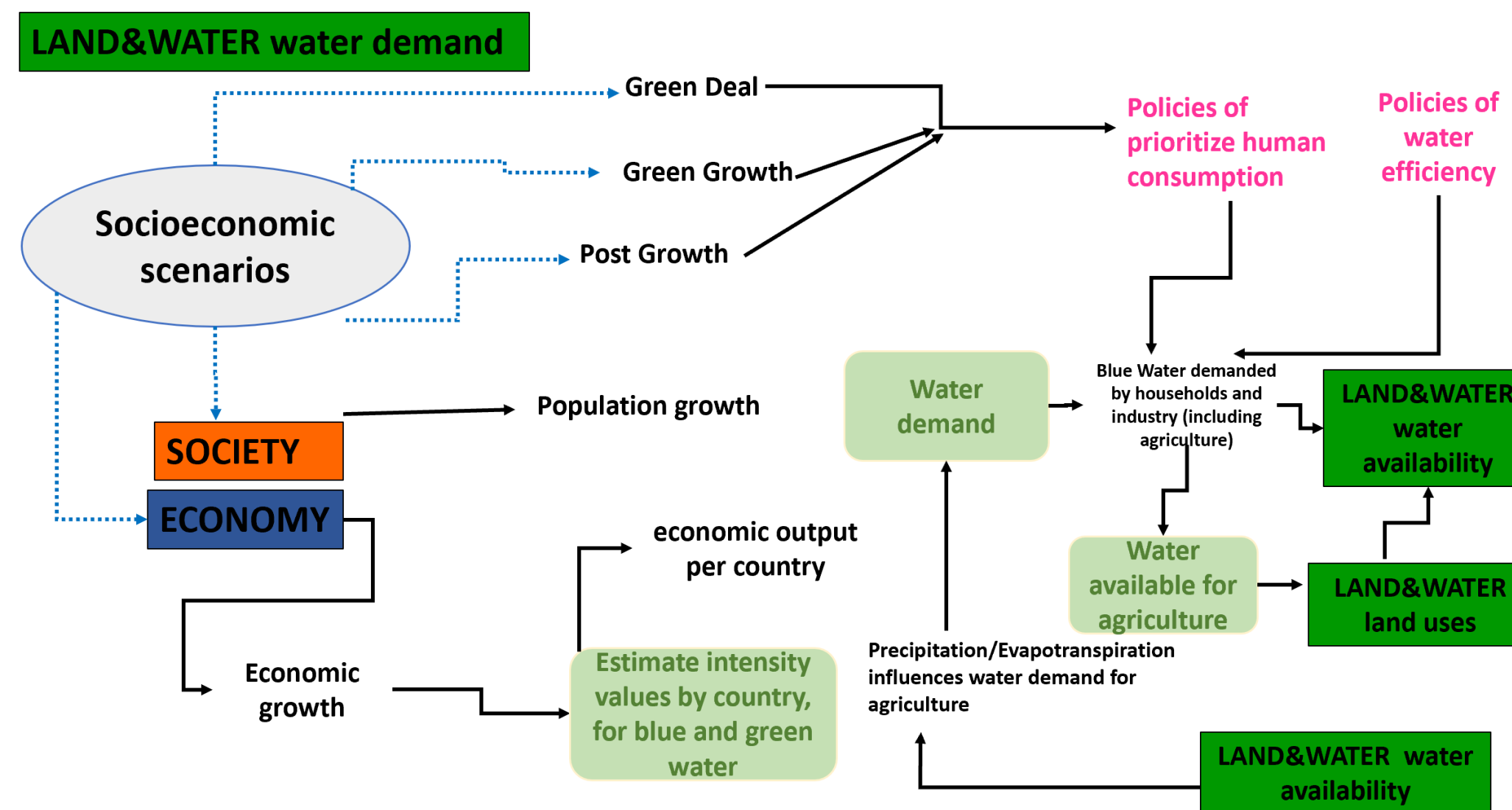
Figure 1: Main scheme of the Water Demand submodule, from the main WILIAM model developed in LOCOMOTION.


Figure 2: Blue water stress for the 9 LOCOMOTION regions and the World average.

3. Preliminary results

Preliminary results indicate, for example, Blue Water stress will increase across almost all the World, until 2050 (**Fig. 2**).

Land use changes are predicted to occur especially in developing countries, with an increase of croplands and a decrease of forest managed areas (World average) (**Fig. 3**).
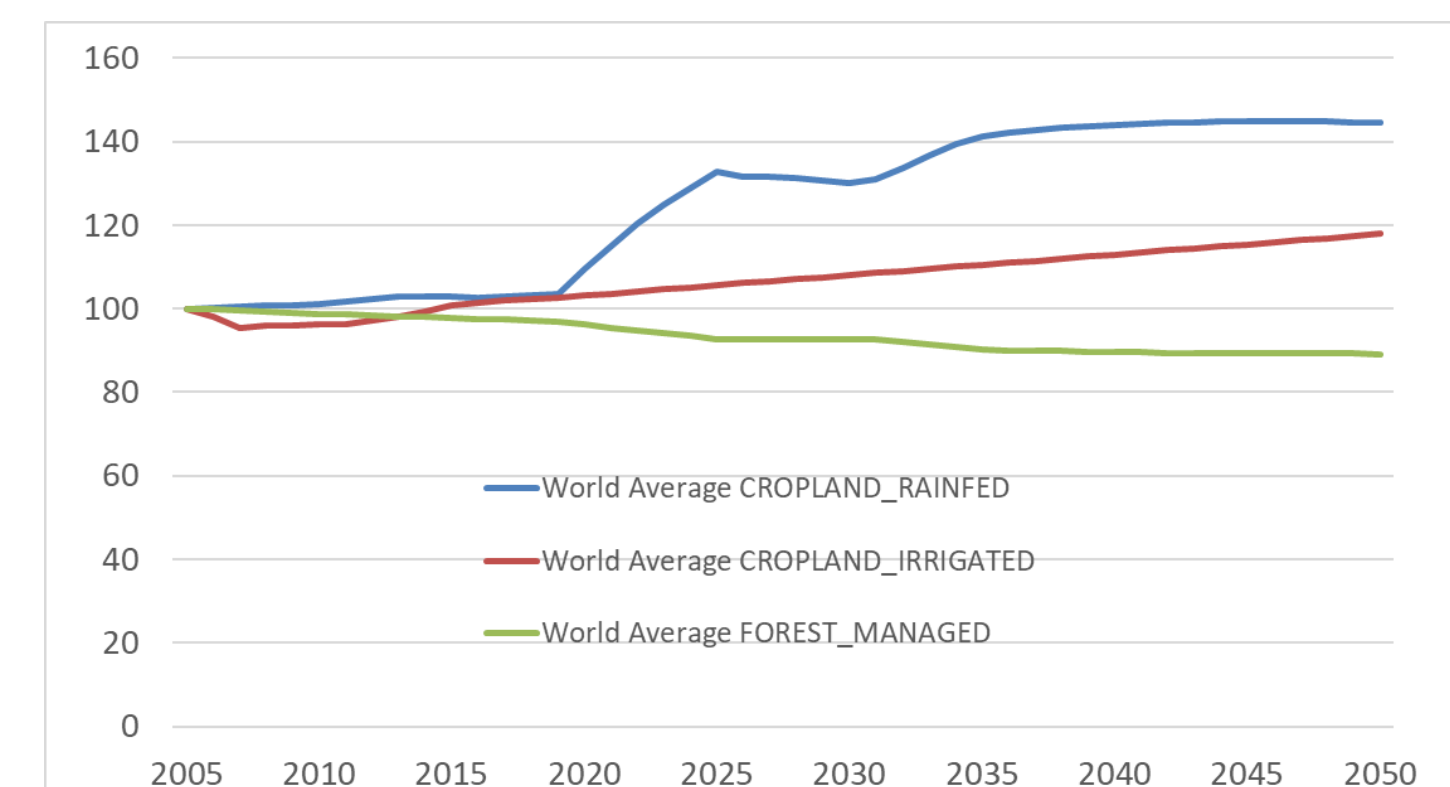
Figure 3: Land use changes (indexed values)