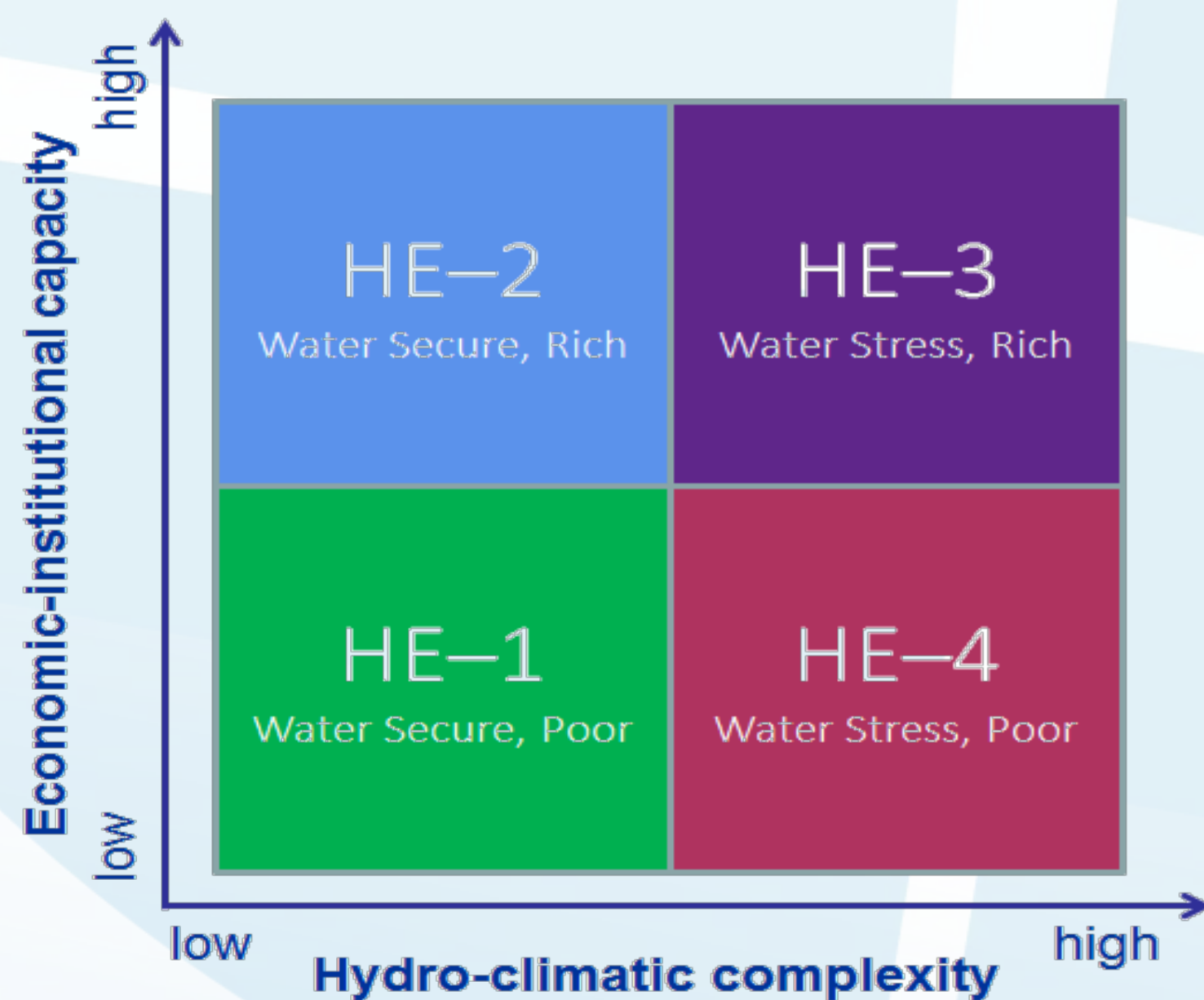


## Hydro-Economic (HE) classification system for water security

- Following a systems analysis risk-science perspective, the Water Futures and Solutions Initiative (WfS) has developed a novel methodology for measuring water security and the identification of hot-spot water challenges.
- The HE classification system evaluates for watersheds, countries or regions two dimensions: (i) exposure to complex hydro-climatic conditions (x-axis), and (ii) the economic-institutional capacity to cope with water-related risks (y-axis).

## Hydro-economic development challenges

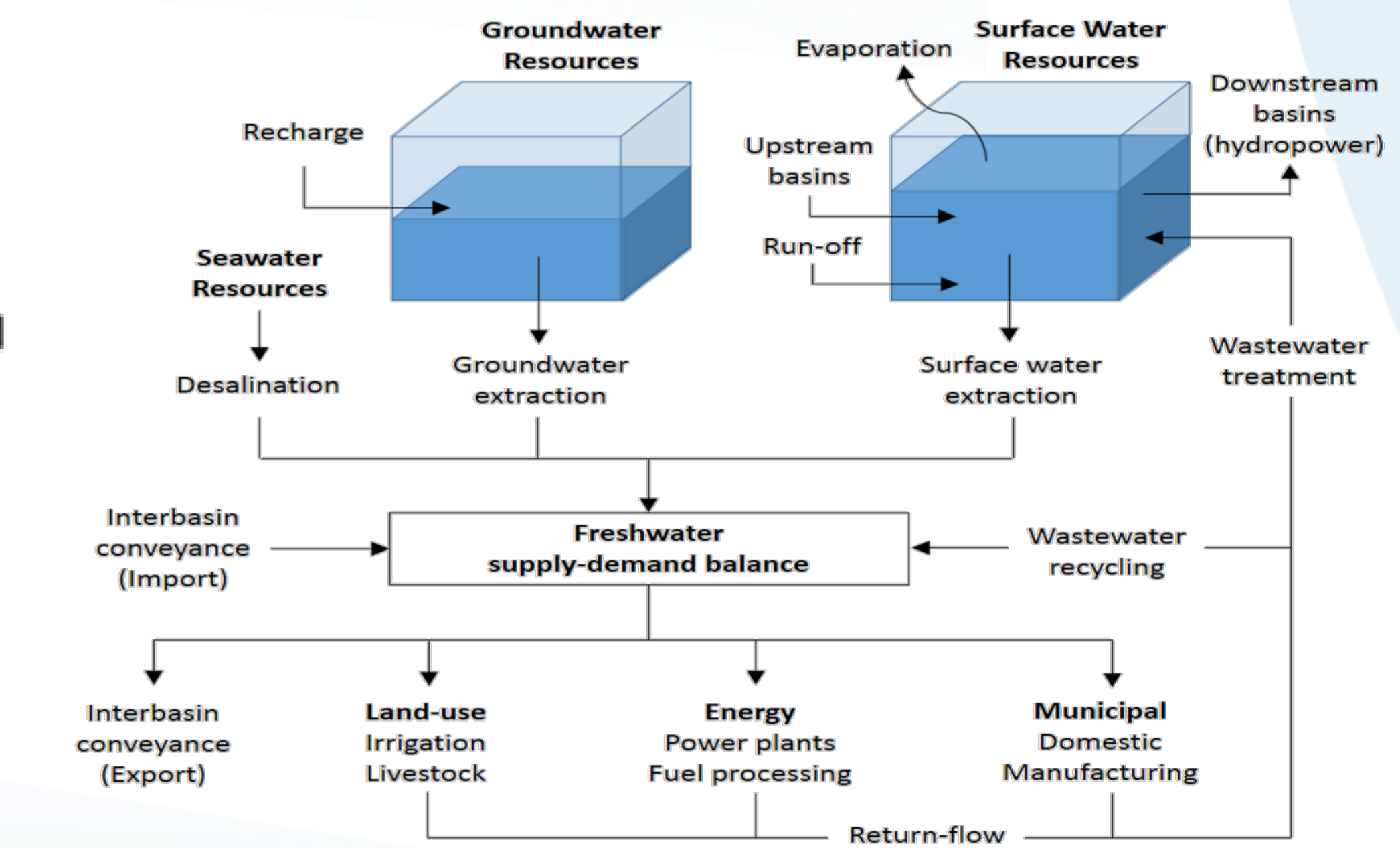
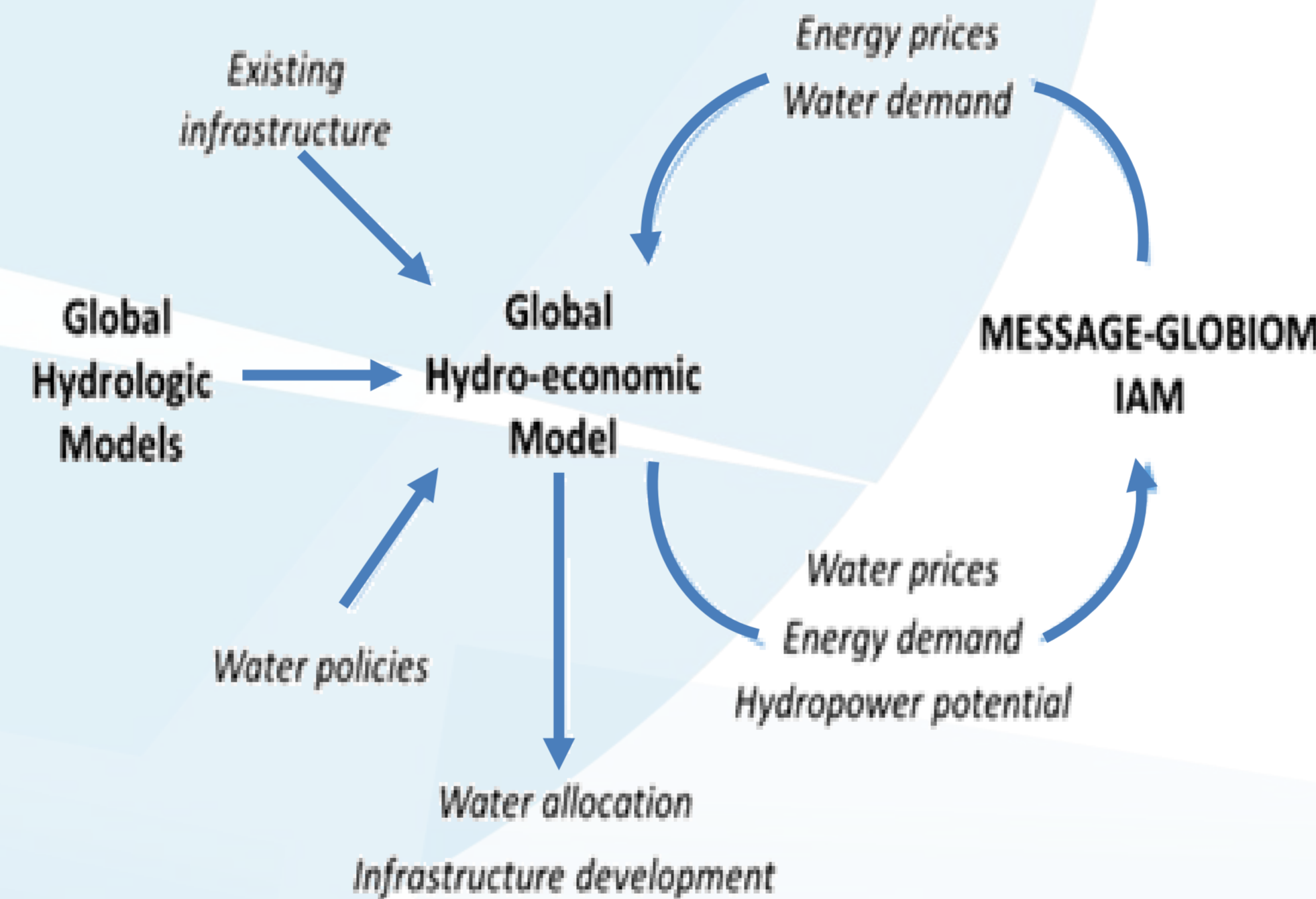


(resources/cap, withdrawals/resources, variability, dependency)

## Global Hydro-Economic modeling (GHEM) framework

- GHEM is a modeling framework that represents water resource systems, infrastructure, management options and associated economic values in an integrated manner.
- GHEM includes an economic-hydrologic optimization procedure that aims to minimize total costs of meeting water demands from agricultural, industrial and domestic sectors at the level of large-scale river basins, subject to various technical and resource constraints.

## Schematic representation of the modeling framework



## People exposed to different degrees of vulnerability

Degree of vulnerability	Complexity of Hydrology	Economic-institutional capacity	Current 2010 [mio. people]	Scenario SSP2 2050 [mio. people]
Lower half	X-Ind. > 0.5	Y-Ind. < 0.5	3041	2112
High	X-Ind. > 0.6	Y-Ind. < 0.4	1831	385
Very High	X-Ind. > 0.7	Y-Ind. < 0.3	600	43
Total Population			6812	9098

## Water policy interventions and the cost of water supply

