Economics is concerned with the allocation of scarce resources among competing demands for them for the consumption, production, and trade of goods and services. In responding to challenges surrounding resource use, contemporary economic analyses increasingly include the availability and use of land, subsoil materials, and my focus today, water. Over the past several years my colleagues and I have carried out a series of studies about global agriculture, examining the adequacy of the water supply to feed a more affluent population expected to reach 9-10 billion by 2050. I describe the distinctive features of our model of the global economy, namely the logic governing regional constraints on water availability, the trade in water-intensive goods, and the incorporation of alternative agricultural technologies, rainfed and irrigated. I discuss the main empirical results, a strong prominence for Africa and Latin America in future agricultural production and the role that the expansion of irrigation infrastructure could play to increase food production without deforestation. I plan next to investigate ways to reverse the mining of aquifers. From a modeling point of view, this requires distinguishing surface from ground water sources for irrigation (and other uses) and representing not only water flows but also stocks -- in particular the capacities and recharge rates of major aquifers. Another high priority for collaborative work is to develop a process-level characterization of infrastructure alternatives for water withdrawal, transfers, and delivery and for alternative technologies for irrigation, thermoelectric power cooling systems, and municipal provision of water and related services at meso-level of detail that can be incorporated into an input-output model of an economy.

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