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Satellites, Water, and Food Security

As a consequence both of the great acceleration since the 1950 and the increasing capacities to analyze and understand the environment and its limits, the discussion on the global limits to consumption was revitalized. It is increasingly held along the lines of population growth and rapidly changing demographic patterns, increasing global wealth, changing consumption patterns of large parts of the global population, and climate change. The conflict between limited natural resources and human development goals was central to societal discourse throughout most of human development and has gained new attention starting with the Club of Rome's "Limits to Growth," the work of the IPCC on the impacts of climate change and the latest developments in food prices, food market volatility, and the discussion of global land grab.

New approaches and views like earth observation from space, numerical simulations of the earth system, and the globalization of communication and trade also radically changed the view on the nature of environmental limits. Today the perception of natural limitations being imposed on nations in their competition with other nations has vanished and gives room to the perception of natural limitations as guardrails to sprawling human consumption patterns, which are increasingly understood as the core of a future global set of regional cultures. Sustainability of development as a paradigm inadequately describes the new need for a mixture of efficiency, sacrifice, strategy, tradition, technology, and culture in a knowledge driven societal approach to future natural resources use.

Global demand for agricultural products is projected to double by 2050. I use the immense amounts of water, a renewable yet limited natural resource, necessary to ensure food security as point of departure for a critical analysis of: 1) how it got so far; 2) what will likely be ahead of us; 3) whether global megatrends are suited to connect the past with the future; and 4) how global observations, understanding of planetary processes and boundaries of the environment and scenario simulations can be used for a new understanding of the limits within which a global set of regional cultures can develop.