Options for Water Distribution and Wastewater Treatment in Mexico City

Topic: Addressing Strategic Challenges of the 21st Century: Deepening the Collaboration between Input-Output Economists and Industrial Ecologists
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While the centrality of water in the ecological sustainability of socio-economic systems gains in recognition and acceptance, recent research in input-output economics has made progress in exploring the complex relationships between hydrologic and economic variables. Given particular developments in economic modeling and in the provision of data, the interdependencies between volume requirements, production technologies, and the conditions for environmental sustainability, even distinguishing among water sources, are now possible to establish and compute at the regional, national, or global levels.

Input-output databases typically combine activities for water distribution and wastewater management into a single sub-sector, frequently further merged into a "utilities" sector, along with the provision of gas and electricity. To further evaluate goals of development and sustainability in the present and in the future, the representation of water extraction, distribution, and wastewater management needs to distinguish specific and alternative ways of providing these services. A review of the literature shows that industrial ecologists have developed the data needed to implement LCAs about, for example, alternative wastewater treatment activities. However, these analyses are typically conducted for individual processes rather than extending the boundary to include all the processes required from the intake of needed resources to the delivery of the service in question.

Thus engineering information is available for specific parts of the production processes for providing water-related services, and a framework exists for incorporating such information for analysis within the context of the economy as a whole. This paper addresses the vital "middle" levels of information and of conceptualization that are still missing: namely, identifying the relevant stages of production and distribution and organizing them into identifiable economic sectors for analysis of alternative ways of providing basic water-related services in environmentally sustainable ways. Mexico City faces a severe water crisis and serves as the case study for developing these concepts and technological options.