# On economics as a metabolic process: a transdisciplinary review of the academic literature on urban metabolism.

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## Abstract

The purpose of this essay is to bring together some of the most salient aspects of urban metabolism *deduced* from the academic literature of several disciplines such as ecology, ecological economics, political ecology and environmental sociology. The article analyses the history of the concept, from its inception to recent developments, highlighting how the different definitions used by various disciplines have led to the development of several methodologies of research. The possibility of using this concept at different levels of analysis, from micro-cellular to macro-economic assessment, provides an understanding of the different ways in which natural and artificial systems can manage their resources to ensure their own maintenance and reproducibility. In this regard, the metabolic approach could lead to the development of sustainable production and consumption patterns in accordance with the Sustainable Development Goals of the Agenda 2030. The article aims to treat the topic from a biophysical and socio-political perspective in parallel, trying to highlight the similarities and differences between natural and man-made systems. In both, input processing and output discarding appear to be a metabolic process structured as a network. Therefore, it has become critical to understand how processed energy-material is distributed along the value chain as well in the food chain. This kind of process is not only biophysical, but involves the entire structure of knowledge, institutions, social norms and uses, and all environmental representations of all forms of life that contribute to constantly creating new forms of nature. In the final part of the contribution there is also a reflection on plant metabolism. The academic literature seems to flatten on animal metabolism, while the functioning of the plant body could provide insights in terms of information sharing, democratic decision-making, equitable distribution of energy-matter and, in general, a more equitable and environmentally friendly model of society. Considering the Earth system as a whole, where human economies play a crucial role, could provide help on how to address the issue of environmental sustainability in terms of reproducing "social-ecological regimes."

**Keywords:**
Urban metabolism; Socioeconomic metabolism; literature review; Sustainable Development Goals; Natural resources Managment; Urban ecosystem.

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