

Stocks and flows

DEFINITION

The stocks and flows concept originated in economics in the 1960s. Best known today is the stocks and flows concept of finances. Stocks are quantities that do not move, whereas flows are quantities that move. Flows are measured quantities per time. This differentiation between statics and dynamics makes the principle applicable to architecture, urban design and territorial planning. The stocks and flows we are most interested in are those of people, water, material, energy, density, and information. Stocks and flows are also basic building blocks of system dynamics.

This chapter offers an overview, while in-depth descriptions and applications of the individual stocks and flows appear towards the end of the book.

The Irrawaddy river in Myanmar and the ecosystem it creates are good examples of **stocks and flows** in architecture, urban design, and territorial planning. The river changes its volume drastically twice a year. The water it brings from the mountains carries sand and other sediments that settle in the large areas it floods. Once the water level recedes, the river has already deposited a small stock of material in the form of fertile earth on its banks that can then be used for a few months. People move in and erect temporary housing and shelter: a stock of material and low-density settlements emerge for a few months. Animals accompany the peasants and deposit fertiliser, becoming another contributor to the stocks and flows of the land. Information on the usability of the land and on the best places to settle is transferred via mobile telephones, creating a flow of information. Farmers grow vegetables and bring them to the market, creating that way a small flow and possibly stock of finances. The entire landscape changes over the years and, as a result, creates a stock and flow of landscape elements such as land, bodies of water, trees, and other vegetation. Yet the example also shows how a single stock and flow cannot be isolated from the others. The water mixes with the material and the sand deposits. Later, people use the clay to burn pots, and they harvest the sand and ship it to the city to construct buildings. In Europe, the ice age deposited large amounts of materials in the path of the glaciers, thus creating the present landscape (stock) in a slow, yet dynamic process (flow).