## FRUGAL INNOVATION

Levänen, J., Hossain, M., Lyytinen, T., Hyvärinen, A., Numminen, S. and Halme, M. 2016. Implications of frugal innovations on sustainable development: Evaluation of water and energy innovations. Sustainability, volume 8(1).

Frugal innovation refers to solutions created under the circumstances of resource constraints. It is driven by demand, imitation and low-cost competition in emerging markets where enterprises are developing new resource-scarce solutions for low-income and rising middle-income segments. Frugal innovations address problems in healthcare, water, energy, transportation, and communication, by involving the private sector. Frugal innovations typically consist of a few essential features, low-cost, an emphasis on local use, local and discarded materials, simple usability, and the minimum amount of resources.

When aiming at ecologically, socially and economically sustainable frugal innovations, three major sustainability challenges can be identified: the proper integration of material efficiency into product or service systems; the patient promotion of inclusive employment; and the promotion of inclusive and sustainable local industrialization.

## CONCEPTUAL MODEL FOR FRUGAL AND REVERSE INNOVATION

Hossain & Halme (2015)





