

Dealing with soft variables and data scarcity: lessons learnt from the quantification in a participatory System Dynamics model

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Abstract

System Dynamics simulation models are commonly used for exploring, structuring and managing complex problems in order to design more effective policies and inform decision-making. They are often used to investigate areas in which limited knowledge is available, describing nonlinear relationships and including variables representing intangible elements of the system. Indeed, SD practitioners build and depend on formal simulation models to overcome the cognitive limitations to grasp the dynamic complexity of the problem situation, and to make reliable behavioural inferences. While this explorative nature is one of the key advantages of SD models, it also represents a major challenge for modellers working on the quantification and parametrization of the qualitative aspects of a (participatory) model, namely soft variables and data scarce contexts, especially when it is not possible to apply conventional analytical methods. There is a limited availability of procedures to obtain and analyse qualitative information. This paper investigates quantification good practices; on the other side, it describes a quantification process carried out during a participatory SD modelling process on the use of natural space in Thamesmead, an area undergoing urban regeneration in London, United Kingdom.