Using quantitative analysis in a different way: checking the robustness of scenarios based on the narrative of bioeconomy with quantitative storytelling (QST)

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Abstract

This session illustrates an innovative approach pursuing a high quality of the process of producing and using scientific information in the field of science for governance. Rather than relying on the conventional approach using models to identify 'optimal' solutions and generate relative road maps, quantitative storytelling (QST) explores the robustness of the narratives and storylines used to select deterministic models. QST uses relational analysis to explore the impredicative causal relations typical of complex adaptive systems-'we do what we want to do' (downward causation) and 'what we can do defines what we do' (upward causation). This approach requires applying different representations of the metabolism of social-economic systems characterizing (1) how the system budgets its internal resources over different functional compartments (integration of social practices), and (2) how the individual functional compartments interact with the context to produce the resources used by society.
'What-if?' scenarios are checked by contrasting the compatibility of changes in the internal budgeting determined by the effect of a suggested policy and the existence of biophysical constraints that would prevent the achievement of these changes in the functional compartments.

QST does not claim to reveal a univocal truth, nor to predict or forecast what will happen. Rather it flags the existence of serious doubts about the credibility of policies and scenarios that simply 'cannot happen' (via negativa). In this way different stakeholders can focus their attention and double-check the assumptions, including numerical information, found to be problematic.

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The session consists of three presentations covering (1) the importance of checking the robustness of the narratives used in the discussion of bioeconomy policies by mixing quantitative analysis and participatory processes, (2) examples of 'grammars' used for the analysis of the congruence over the impredicative relations exhibited by data spanning non-equivalent models, and (3) an application of the method to check scenarios associated with proposed bioeconomy policies in the Grand Geneva region.

Keywords: Quantitative storytelling, Science for governance, Bioeconomy narratives, Futures studies