Using group model building to support strategic sustainable development

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Extended abstract
Many initiatives to sustainable development have emerged over the years in different domains of planning. At global scale, the Sustainable Development Goals (SDGs) are well-established and used as guidance for both public and business policy development and strategy planning. The Global Reporting Initiative is also increasingly being used which, gathered under a common framework, enhances transparency, understanding and communication of sustainability-related impacts of organizations. At regional scale, (manufacturing-) corporations can take support in their sustainability efforts by a combination of different initiatives, such as life cycle assessment, eco-design, cleaner production and corporate social responsibility (Lozano, 2012), to mention a few. Many of these initiatives have emerged in collaboration with academia, but many of them have seemed to lack a structured approach to planning that acknowledges the complexity and interdependencies of the socio-ecological systems which human society rely upon. Now, several authors have therefore highlighted the need for a strategic perspective on how a sustainability transition can be achieved (see e.g., Nikulina et al., 2019). This is a core purpose of the Framework for Strategic Sustainable Development (FSSD) (Broman and Robért, 2017), which aims to guide how planning can be structured strategically towards system scale sustainability with minimized risks for sub-optimized solutions.

The opportunity to support strategic sustainable development through GMB applications have been investigated in this paper, guided by the research question '*In which way does the steps of the group model building process support a strategic sustainability perspective in planning and decision-making*?' Four examples, i.e., *sustainable product development workshop method, sustainability-driven design optimization, transport strategy and planning, and sustainability and complexity modelling in higher education*, provided together illustrate that the design of a group model building activity can foster strategic sustainable development to different degrees, and in different decision-making context. Co-visualization of socio-ecological system behaviour in form of causal loop diagrams can help foster and leverage sustainability systems thinking that provide a basis for ideation to system intervention. Hence, the educative first steps of GMB can aid the first steps of the process of strategic planning toward sustainability. More detailed visualization in form of e.g. system dynamic models, may allow consequences of decisions to be visualized at a more advanced level of detail. Hence, the latter steps of a strategic planning towards sustainability process when sustainability improvement actions are to be selected prioritized, may be supported by the last steps of the GMB by providing more robust decision support. Altogether, the results show that GMB helped many study participants improve their ability to contextualize a complex socio-ecological issues, regardless background.

Future work will further elaborate on how group model building guided by a strategic sustainability perspective can be used to simulate scenarios in different degree of detail, at different decision-making levels in industry and society in planning and decision-making.

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