EWG-MCDA 92, 16-18 September 2021, Cracow, Poland

“Multi-Criteria Decision Analysis as a transdisciplinary science”

In our highly interconnected world, problems are wicked and the role of science in generating solutions is constantly evolving. Transdisciplinary research (in accordance with the scientific paradigms of post-normal or Mode-2 science) aims to address the complexity of real-world problems by bringing together scholars and practitioners through processes of knowledge co-production across diverse scientific disciplines and societal groups, which place social learning at their core.

MCDA methods have traditionally been used to address the complexity of decisions in real-world situations, especially where seeking sustainability in presence of conflicting viewpoints between diverse social groups (e.g. in energy, water or agricultural policy design). Hence, some argue that MCDA is inherently transdisciplinary, as it supports the consideration of inputs from diverse stakeholders (Bausch, Bojórquez-Tapia, & Eakin, 2014). MCDA methods have indeed been applied in transdisciplinary research contexts and their usefulness has been recognized (Kuzdas et al., 2016), (Wilkens (nee Braune) & Schmuck, 2012), (Bausch et al., 2014), (Trutnevyte, Stauffacher, & Scholz, 2011). However, whether they provide a holistic and transdisciplinary framework for sustainability is an open question (Troullaki, Rozakis, and Kostakis, 2021). As a matter of fact, in many cases the role of participatory MCDA processes in promoting social learning has been found to be below expectations (Saarikoski, Mustajoki, Hjerppe, & Aapala, 2019). Participation is often fragmented and restricted to consultation at specific stages of the decision process, while crucial aspects such as the goal and scope definition, identification of alternatives and assessment of impacts are usually restricted to researchers, which inhibits genuine collaboration (Evers, Almoradie, & de Brito, 2018). In MCDA applications the emphasis is often on producing a result based on stakeholder inputs rather than using the results as a boundary object (Clark et al., 2016) in an open dialogue aimed to build mutual understanding and consensus (Evers et al., 2018).

MCDA can be a great asset in transdisciplinary research if the focus is on the process and not only on results. “The ways in which the participatory elements of the method are implemented in the decision context have a strong influence on the success of the method as a whole” (Wilkens (nee Braune) & Schmuck, 2012). However, genuine collaboration between researchers and stakeholders requires time, as well as different skills and, perhaps most importantly, a inclusive mindset by the involved actors. To overcome the antagonism between the sophistication of algorithms and the transparency and simplicity required to enable participation, design theory reveals the value of early stakeholders’ engagement in the MCDA process (Ferreti, Pluchinotta and Tsoukiàs, 2019).

Further research is needed to understand the challenges and opportunities arising from the application of MCDA methods in transdisciplinary research. In this context, we welcome case studies, as well as theoretical and methodological contributions, on the convergence of MCDA methods and transdisciplinary research approaches. Insights from other disciplines, such as social sciences and humanities, and from transdisciplinary fields such as sustainability science, can inform operational research towards MCDA development that fosters mutual understanding and social learning.

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