

Making modelling socially inclusive: Mission possible?

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Abstract: Modelling approaches and practices have often evolved from a (bio)physical or economic perspective, with an emphasis on quantitative data and analyses. When addressing problems with a strong focus on people, modelling often involves attempts to filter and fit understanding about socio-cultural elements and processes into rigid frameworks that may not be compatible with the perspectives they aim to represent. Reflecting on two international development projects that have aimed at understanding how to ensure socially inclusive, equitable and sustainable agricultural and value chain development in India, Bangladesh and the Philippines, we examine the role of our modelling practices in such research contexts. In these projects, all aspects of the problem including crop production, agricultural economics and water management, are heavily shaped by socio-cultural factors including poverty, self-agency, gender norms and power imbalances (Hamilton et al. 2022). While the focus of the research more broadly was on achieving more socially inclusive and equitable outcomes from investments and interventions in the communities, modelling, or more specifically, integrated assessment, was used as a tool for integrating and formalising the team's understanding of the system (Merritt et al. 2022). With social inclusion the core principle of the projects, we considered our role as researchers in contributing to inclusion/exclusion; here we focus on inclusion in the modelling.

One of the key challenges in our attempts to make modelling socially inclusive has been the need to reconcile the institutional expectations (i.e. from academia as well from funding bodies) for largely quantitative analyses and metrics of success, with the realities of the behaviour, social norms and values of individuals and communities. Despite common expectations that project outcomes can be readily measured and compared, the known complexities of targeted social processes and concepts means that any indicators used provide (at best) a limited measure of the situation or change occurring in the studied communities. To provide a more meaningful picture, indicators need to be described and assessed with respect to their socio-cultural context. This is often best achieved through qualitative formats such as narratives that provide the richness needed to understand the contextual complexity, rather than through quantitative frameworks.

Modelling, on the other hand, is in its essence about simplifying reality. In its broader sense, modelling offers a systematic way to organise data and knowledge, which is valuable for generating insights about complex problems. We argue, for modelling to be socially inclusive, it needs to be flexible in incorporating diverse perspectives and values. This may exclude many forms of modelling, particularly heavily quantitative methods. More importantly, socially inclusive modelling requires the full context (including socioeconomic, cultural, political and environmental aspects) to be explicitly considered, and the assumptions underlying the model variables, processes and structure to be examined and made transparent. We consider the need to strike a balance between the complex reality of socio-environmental problems and the importance of identifying common critical factors and system structures that influence these problems.

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Keywords: *Research for development (R4D), social inclusion, transdisciplinary research*