Evidence-based decision-making using Fuzzy Cognitive Maps: lessons from the Global South

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Environmental and climate related decision-making is a challenge, especially when there is lack of cooperation and coordination among governance agencies, as is common in the global south, and India in particular. This is especially the case in peri-urban areas around Indian cities and can be ascribed to the lack of institutional capacities and governance structures to respond to the changes happening in the area. A key reason for this can be the jurisprudence as peri-urban areas often fall through cracks when it comes to authorities as urban and rural areas are managed by two different bodies, resulting in hazy behaviour and uncertain actions among policy makers and communities. In addition to failure of effective governance, even market-based solutions have not been able to preserve the rights to natural resources among peri-urban residents. Given this dual failure, there is a need for greater community involvement to address issues of unplanned development, which is aggravated by climate change primarily, in data poor peri-urban areas. Our study looks to capture hazy knowledge among stakeholders on impacts of unplanned urbanisation, coupled with climate change on water security in peri-urban areas around Bangalore. The study approach is based on developing fuzzy cognitive maps (FCM), which provide a rigorous scientific approach that quantify subjective perceptions of varied groups to compare similarities and differences among groups. FCM approach was used in the study to capture, how water security is impacted based on defined physical and complex abstract and aggregate variables, decided by the stakeholders. 240 FCMs were drawn with stakeholders to capture causal relationships among variables and indicate relative strength and relationships. Once the maps were drawn, their structure was analysed using graph theory and outcomes were determined through on-ground evidences captured using FCM to obtain and combine knowledge sources and run different policy options, which were shared at a policy dialogue platform. Thus, using cognitive maps, we were able to develop models, which not only, incorporated public opinion and understanding but also and identify implementable policy options. This enabled us to inform stakeholders regarding different management options and enable support for effective water management decisions.