Topic: Advances in linking models in order to address impacts across scales or sectors
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Assessing priorities for enhancing adaptive capacity of agricultural systems to climate change using fuzzy logic-based approaches.

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This study outlines the development of a composite indicator of the adaptive capacity (ACI) to climate change of rural communities in the Oristanese district (Sardinia, Italy). Farming systems include intensive dairy cattle, rainfed dairy sheep, cereals and irrigated horticulture. Twenty-one indicators of AC were derived from an array of several priorities, initially identified by an interdisciplinary team of scientists and then extended and scored (on a rank from 1 to 5) by 31 experts (agronomic scientists, farmers, advisors and consumers). The extended list of priorities was reduced to a set of indicators that could be quantified using data from different sources. The indicators were organized into seven determinants (Infrastructure, Technology, Economic power, Flexibility, Knowledge, Sensitivity, Social capital), in turn organized in three components: Ability, Action and Awareness. AC calculations required that 1) scores for each basic indicator be normalized and aggregated to a determinant value, 2) determinants aggregated to a component value, 3) components aggregated to an AIC (best, 0≤ACI≤1, worst). A fuzzy logic inferring system was used based on the importance of the basic indicators and their aggregation into determinants and components. Favourable/unfavourable thresholds for each indicator were set following expert knowledge and/or survey/census/literature data, while the priority scores were used to assign weighting factors. Results for the Oristanese district indicate a low-medium AC (ACI=0.61) with social capital (0.27) being the strongest determinant and economic power (0.80) the weakest. These findings provide insights for enhancing effective, locally meaningful and feasible strategies by increasing the AC of Oristanese rural communities.