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**Agent-based modeling of land-use changes and vulnerability assessment in a coupled socio-ecological system in the coastal zone of Sri Lanka**

Land-use and land-cover changes (LUCC) are an important factor contributing to the vulnerability of socio-ecological systems. Understanding the impacts of policy interventions on LUCC and identifying vulnerable elements are essential for supporting land-use planning and sustainable development. In this study, 20-year simulations for LUCC around Maduganga estuary in Sri Lanka were performed using the agent-based model LUDAS. All scenarios reveal decreases in the size of individual landholdings and in income from farming activities. Changes in access to agricultural subsidies and extension services have only a slight influence on LUCC and livelihoods. The vulnerability of the coastal system to natural hazards was assessed based on the effects of the tsunami in 2004. Statistical analyses reveal the particular vulnerability of fishery households, as they were living closer to the sea and experienced difficulties in economic recovery after the tsunami. Vegetation analyses show the varying impact of coastal vegetation on the destructive energy of the tsunami waves.