



## **Applying an agent-based model of agricultural terraces coupled with a landscape evolution model to explore the impact of human decision-making on terraced terrain**

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Agricultural terraces impact landscape evolution as a result of long-term human-landscape interactions, including decisions regarding terrace maintenance and abandonment. Modeling simulations are often employed to examine the sensitivity of landscapes to various factors, such as rainfall and land cover. Landscape evolution models, erosion models, and hydrological models have all previously been used to simulate the impact of agricultural terrace construction on terrain evolution, soil erosion, and hydrological connectivity. Human choices regarding individual terraces have not been included in these models to this point, despite recent recognition that maintenance and abandonment decisions alter transport and storage patterns of soil and water in terraced terrain. An agent-based model of human decisions related to agricultural terraces is implemented based on a conceptual model of agricultural terrace life cycle stages created from a literature review of terracing impacts. The agricultural terracing agent-based model is then coupled with a landscape evolution model to explore the role of human decisions in the evolution of terraced landscapes. To fully explore this type of co-evolved landscape, human decision-making and its feedbacks must be included in landscape evolution models. Project results may also have implications for management of terraced terrain based on how human choices in these environments affect soil loss and land degradation.