

# A socio-ecological model of the *Opuntia* scrublands in the Peruvian Andes

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*Opuntia* scrublands are important socio-ecological systems (SESs) in the Andean area. *Opuntia* provides a variety of products employed in the human diet and in animal feed, as well as cochineal insects, a highly valued source of dyes. Land clearance on the scrublands promotes changes in the use of the land and the development of new economic activities. In this article, we describe the development a numerical model, built as a five submodel interactive set under Stella® v9.1.4, to understand the dynamics of this SES in the Andean area of Ayacucho-Peru in terms of its vegetation, scrubland habilitation, cochineal collection, fruit harvest and livestock keeping. Ecological components (cochineal insects and vegetation) are modeled considering system's carrying capacities; social components (fruit, livestock and land) incorporate economic (investments, costs and benefits) and social (participation, association) parameters and processes. The model highlights the role of social capital on lan