



Numerical model to evaluate the mitigation strategies to combat desertification and drought in the arid land of northern Chile.

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Desertification is considered a global environmental problem with political and socioeconomic implications. Desertification, exacerbated by climate change, is the largest environmental problem in Chile affecting almost two third of the national territory. This study takes place in a latitudinal gradient of the north-central Chilean drylands, where desertification is a threat to agriculture, livestock and forestry (ALF). The critical areas or priority areas for combating desertification are the northernmost areas of the region under study. In the context of the United Nations Convention to Combat Desertification (UNCCD) and the implementation of the Chilean National Action Programme (NAP), the country is conducting policies and investing in mitigation strategies to combat land degradation and desertification. The main objective of this study is the development of an integrative methodological approach using real data of the territorial and socioeconomic indicators. With the proposed methodology we assess the impact of the mitigation and land degradation strategies supported by the ALF promotion agencies in the fight against desertification, projecting different scenarios of change. The data were collected in 2008 in Santiago, Chile. The results of the Principal Component Analysis (PCA) suggest that technical irrigation and the improvement of grasslands and pastures play an important role in the fight against desertification. The results of the model projections are consistent, suggesting that the efforts of the ALF promotion agencies have a positive impact in fighting desertification. Inaction of ALF mitigation strategies would increase desertification. This methodological approach, performed with real data, can also determine the main causes of desertification in such a complex area as the studied one, where we can find the desert itself, and its desertification endangered valleys, the Andean plateau, the transitional area and the southern regions. It is also a contribution for the development of integrative assessments, for replication and for forthcoming discussions.