

Science for Environment Policy

Desertification study proposes new decision-making method for complex environmental problems

Decision-making about complex environmental problems like desertification, which also have important social and economic implications, could be improved by employing methods outlined in a new study. The study outlines the steps taken by researchers on behalf of the Canary Islands government in devising a policy strategy for tackling desertification and describes a three-step methodology and participatory decision-making process.

A combination of erosion, drought and environmental degradation, desertification has multiple causes that range from biological and physical to social and economic aspects. About 82% of the Canary Islands archipelago is considered at risk of desertification from natural causes including the climate and [soil](#) type, as well as human activities such as intensive [agriculture](#) and covering soil with artificial surfaces (soil-sealing). Tackling desertification is a complex policy problem because it requires the coordinated efforts of stakeholders from both public and private sectors of diverse fields.

The authors, based in the Canary Islands, carried out the study as part of a research project on decision-making about desertification funded by the Canary Islands government. They propose a three-stage method that combines tools from social, natural and pure sciences. According to the authors, their method is capable of helping decision-makers understand what policies need to be implemented to move the Canary Islands onto a "good path" that controls and reverses desertification, and away from a "bad path" that increases it.

The first stage used information from sources such as farming statistics and stakeholder interviews to identify the key factors influencing desertification, and analyse the interactions between them. The second stage used systems dynamics modelling to understand how these key variables behave over time to produce desertification, and how they affect environmental, economic and other systems. The third stage combined qualitative and quantitative information from the two previous stages to create scenarios where policy strategies are introduced to address the problem of desertification.

In addition, the researchers ran simulations to test the effects of implementing policy actions versus a business-as-usual scenario. One predicted what would happen over time if the authorities adopted the policy strategies identified for controlling desertification, such as growing crops with reduced water requirements and reducing unnecessary soil-sealing, and another predicted what would happen if no policy strategy was adopted. Over the course of 30 years, the two scenarios gave very different results, with the adoption of the relevant policy actions leading to a reversal of desertification processes, compared to a marked increase in desertification in the business-as-usual case.

After creating the scenarios, the researchers organised a focus group bringing together 15 representatives from public and private sector institutions to discuss the results. The group came up with the Canary Island strategy to combat desertification (CISCoD). The strategy is based around six priority action areas: planning and land management; water planning and management; infrastructure, urban planning and waste management; tourism and trade; awareness, education and training; and institutional coordination, participation and evaluation. This was the first time that public and private sector institutions in the Canary Islands had taken part in a joint discussion of the problem of desertification. The CISCoD is currently being implemented by the Regional Government.

According to the researchers, new, more inclusive styles of governance require better systems for involving diverse stakeholders in environmental decision-making and the method they propose represents a practical tool or 'platform' for participatory decision-making processes. Whilst desertification is just one example of how this tool could be applied, it may also prove useful in dealing with other complex problems in environmental policymaking.



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