

# 38 percent of world's surface in danger of desertification

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This is the Guadalquivir River as it passes through Seville, one of the areas most at risk of desertification in Spain. Credit: Nesta Vázquez

A team of Spanish researchers has measured the degradation of the planet's soil using the Life Cycle Assessment (LCA), a scientific methodology that analyses the environmental impact of human activities, and which now for the first time includes indicators on desertification. The results show that 38 percent of the world is made up of arid regions at risk of desertification.

"Despite improvements in the LCA, it has a methodological weakness, which is a lack of environmental impact categories to measure the effect of human activities such as cultivation or grazing on the [soil](#)", Montserrat Núñez, lead author and a researcher at the Institute of Agro Food

Research and Technology (IRTA), tells SINC.

The research, published in the latest issue of the *International Journal of Life Cycle Assessment*, is the first study in the world to include the impact of [desertification](#) in the LCA, based on classifying 15 natural areas or "eco-regions" according to their degree of aridity. By simultaneously using the LCA and a Geographic Information System (GIS), the researchers have shown that eight of these 15 areas can be classified as at risk of desertification, representing 38% of the land surface of the world.

The eight natural areas at risk are coastal areas, the Prairies, the Mediterranean region, the savannah, the temperate Steppes, the temperate deserts, tropical and subtropical Steppes, and the tropical and subtropical deserts.

"The greatest risk of desertification (7.6 out of 10 on a scale produced using various desertification indicators) is in the subtropical desert regions - North Africa, the countries of the Middle East, Australia, South West China and the western edge of South America", the scientist explains.

These are followed by areas such as the Mediterranean and the tropical and subtropical Steppes, both of which score 6.3 out of 10 on the scale of desertification risk. Coastal areas and the Prairies are at a lower risk of desertification, with 4 out of 10.

"Unsustainable land use may lead to soil becoming degraded. If this happens in arid, semi-arid and dry sub-humid regions, such as Spain, this degradation is known as desertification, and the effects can be irreversible, because they lead to areas becoming totally unproductive", says Núñez, who worked on the study with scientists from the Autonomous University of Barcelona and the National Technological

University in Mendoza, Argentina.

In order to establish their methodology, the researchers used four biophysical variables that are the main causes of desertification - aridity, erosion, over-exploitation of aquifers and risk of fire. "This makes it possible to satisfactorily evaluate the impact of desertification of a particular human activity, and compare the impact of the same activity in a different place, or the impact of different activities carried out in the same place", explains the researcher. The methodology proposed by the scientists is currently being put to use in various case studies in Spain and Argentina.

### Completing the study of desertification

The new research shows that using the LCA in combination with GIS makes it easier to adapt the LCA to study the impacts of land use, not only in the case of desertification, but also in terms of loss of biodiversity, erosion, or even water consumption.

This new methodology will provide the Life Cycle Assessment (LCA) with an [environmental impact](#) category that will make it possible to measure "the desertification potential caused by any human activity", adds Núñez.

The Life Cycle Assessment (LCA) is a scientific methodology that objectively analyses the environmental impacts of an activity or process, taking in the full cycle, from extraction of raw materials right through to management of the waste generated at the end of this material's useful life.

**More information:** Núñez, Montserrat; Civit, Bárbara; Muñoz, Pere; Arena, Alejandro Pablo; Rieradevall, Joan; Anton, Assumpció.

"Assessing potential desertification environmental impact in life cycle

assessment" International Journal of Life Cycle Assessment 15(1):  
67-78, 2010.

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