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Nanotechnology for soil moisture management in agricultural lands of the Andean Region

BOLIVIA,ECUADOR

Webstory

Technological solution

Technological description

The project strategy is based on the development and use of nanoclays and hydrogels. Nanoclays consist of ultra-fine particles with a high surface area and expansion capacity, allowing them to retain large volumes of water. Hydrogels are made from cellulose fibers derived from agricultural waste and are low-cost and environmentally friendly, making them ideal for agricultural use. After laboratory development, both materials will be tested and validated in fragile Andean agroecosystem soils to evaluate their effects on water retention, microbial diversity, and agricultural productivity.

Impacts and results

The project aims to develop nanoclays and/or hydrogels that increase soil moisture retention capacity by more than 10% and improve crop productivity by over 20%. These materials will be validated with the active participation of agricultural sector stakeholders in Bolivia and Ecuador. Widespread acceptance is expected among producers, along with potential interest from private companies in producing and commercializing the products. Results will be disseminated through training sessions, printed materials, scientific publications, and other means. Online platforms managed by co-executing agencies, partner organizations, and other project-related institutions are expected to reach over 2,000 actors in the productive, scientific, and academic sectors.

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