

Building soils for dry climates

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Abstract

Soil degradation is a short or long ongoing process that limits ecosystem services. Intensive land use, water scarcity, land disturbances, and global climate change have contributed to reducing the quality of soils worldwide. Restoring and controlling these damaged environments is essential to avoid negative effects on humans' well-being (e.g., poverty, food insecurity, wars, etc.).

Here we present:

1. Constructed soils as a solution to soil degradation. This construction uses basic knowledge of soil pedogenesis and biotic/abiotic interactions to create a “soil” using available wastes matching certain conditions, and intentionally shapes or reorganizes them in a variety of layers based of their characteristics to provide a suitable environment for vegetation growth.
2. Several case studies of constructed soils in dry climates will be introduced.
3. The existing approaches of soil restoration in dry climates, their limitations, and how to overcome them through the use of constructed soils, will be discussed.
4. What needs to be considered when building a soil under a harsh climate with water limitation.

We conclude that constructed soils have the potential to be a successful solution to cope with land degradation in dry climates, and that this technique could be a step toward boosting restoration efforts, reducing costs and improving life quality.