A classification of maintenance practices for agricultural runoff management structures to enhance climate adaptation scenarios and strategies

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LANDSCAPE 2024

CROSSING FUNCTIONS & ACTIONS OF RUNOFF MANAGEMENT STRUCTURES EASES THE DESCRIPTION OF THEIR MAINTENANCE

A classification of maintenance practices for agricultural runoff management structures to enhance climate adaptation scenarios and strategies

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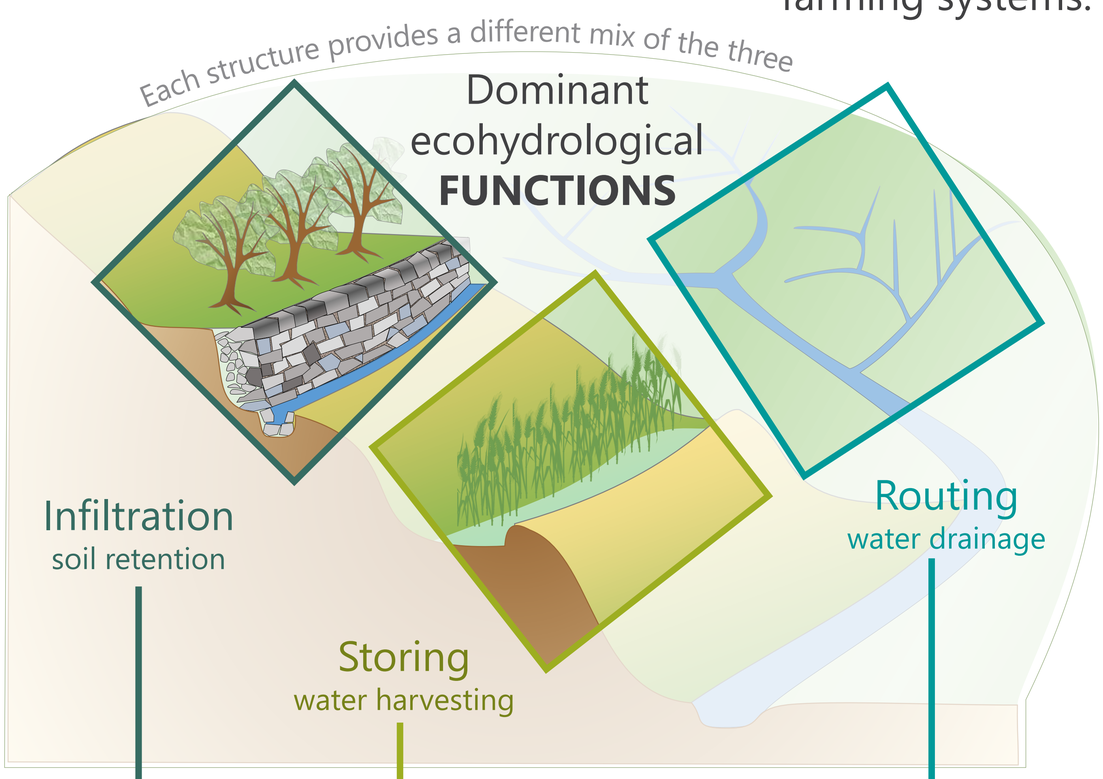
DOI
10.5281/zenodo.13760214

Runoff management is crucial in preventing land degradation and addressing water scarcity [**1**]. Structures (e.g. ditches, terraces), ensure water drainage and routing, soil retention, and water harvesting, while providing multiple other services. Their integration into **rural landscape management** is critical to the resilience of farming systems.

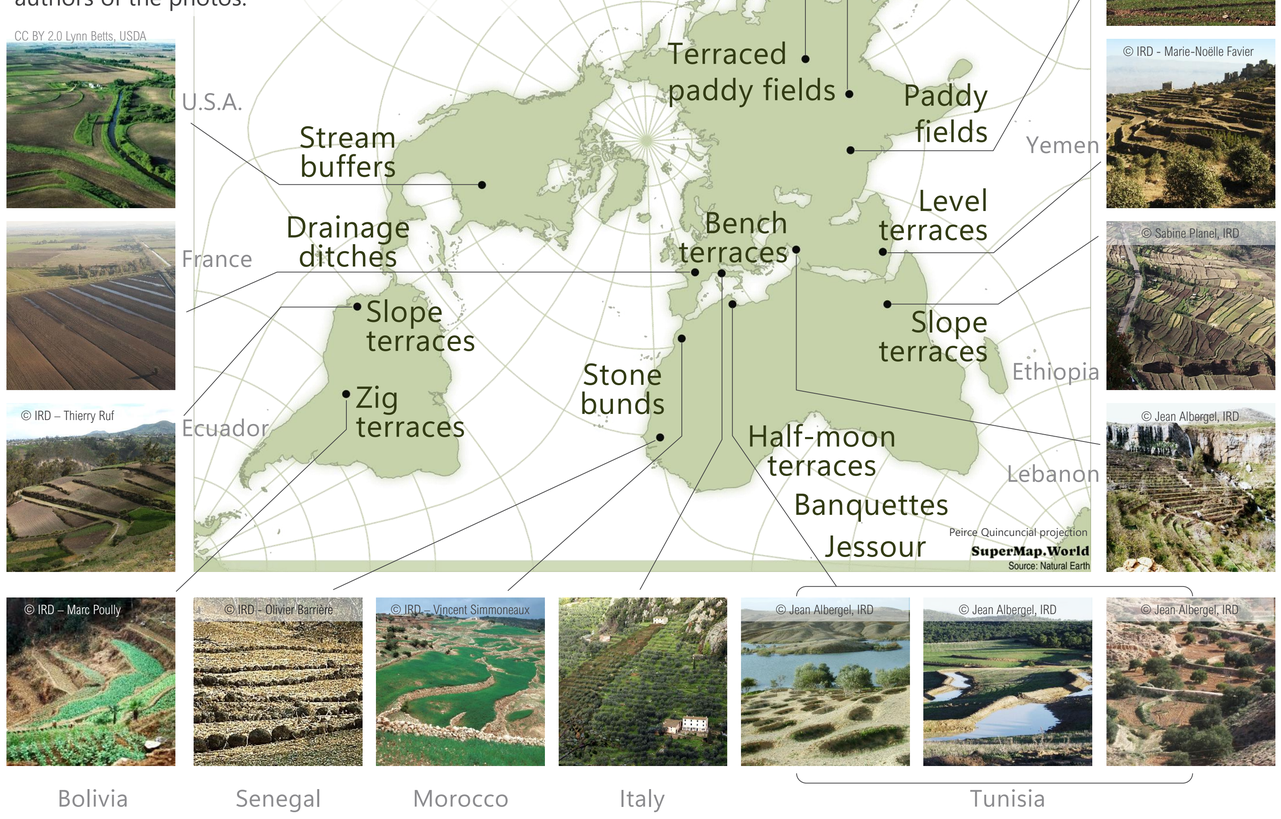


	Infiltration soil retention	Storing water harvesting	Routing water drainage
LINEAR STRUCTURES	○○○	Trenches and infiltration pits, tied ridges, retention ditches	Furrow and ditch networks, grassed waterways, vegetative filters
	Contour lines, keylines, earth bunds, taluses (e.g. living hedges, radical terraces, earth-banked terraces), ridge bunds (e.g. V-shaped, eyebrows, tabia), Vallerani system, vegetative strips		*Terra-preta* raised beds
AREAL STRUCTURES	Sediment ponds, ponds for groundwater recharge (e.g. sunken streambed structure), runoff basins (e.g. *meskat*, *negarims*, half-moons), embankments, and farm or community ponds (e.g. *johad*, *khadin*)		○○○
	Cross-slope structures and barriers: bench terraces, stone lines and bunds, check dams, silt fences	Stone trench bunds, subsurface stone reservoirs, micro-water storage	Drainage uphill channels (e.g. *acequias*)

Structures vary widely in shapes, systems, and nomenclature, reflecting local contexts.

Maintenance practices are still poorly described, despite their relevance to face **climate change consequences**: soil erosion and flooding risks, droughts and water harvesting needs.

Examples of the heterogeneity of shapes, materials and naming of the onsite runoff management structures worldwide. Terrace naming is based on literature [**2**,**3**], unless otherwise specified by the authors of the photos.



Ditching section cleaning (e.g. vegetation and sediment management)

Shaping shape and earthwork renovation

Building reparation, rebuilding, and veget. manag. (+materials)

We propose to cross three fundamental **construction ACTIONS** based on the ethnological concept of "technical fact" [**4**] with ecohydrological functions, and geometries.

The result is the definition of a **framework** for harmonising the description of maintenance practices.

Future works should explore the integration of structures' **maintenance** into the farming system and landscape management of soil and water.

https://doi.org/10.5281/zenodo.13760214

[**1**] Molénat *et al.* (2023) Diversification from field to landscape to adapt Mediterranean rainfed agriculture to water scarcity in climate change context, *Curr. Opin. Environ. Sustain.*, 65:101336
[**2**] Chen, Wei, & Chen (2017) Effects of Terracing Practices on Water Erosion Control in China: A Meta-Analysis, *Earth-Science Reviews* 173:109–21
[**3**] Dorren, & Rey (2004) A Review of the Effect of Terracing on Erosion. In *Briefing Papers*, 97–108. Cinque Terre (Italy): Soil Conservation and Protection for Europe (SCAPE) project
[**4**] Gras *et al.* (1989) *Le Fait technique en agronomie: activité agricole, concepts et méthodes d'étude*, Ed. L'Harmattan, Paris

Paper ID 109848

D.R. received support from ANR (grant n. ANR-22-CPJ1-0050-01), IRD and the University of Montpellier Experimental Public Institution Excellence Program (UM EPE) as a contribution to the Junior Professorship in **Landscape Agronomy**.

Berlin, 17–19 September – Agroecosystems in Transformation: Visions, Technologies and Actors
Session 1 Visions – 1.4 Resilient agriculture: assessing climate impacts and adaptation practices in rural landscapes