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# **CROSSING FUNCTIONS & ACTIONS OF RUNOFF** MANAGEMENT STRUCTURES EASES THE DESCRIPTION OF THEIR MAINTENANCE LANDSCAPE 2024

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

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routing

infiltration

### 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 Examples of the heterogeneity of shapes, materials rural landscape management and naming of the onsite runoff management storing is critical to the resilience of structures worldwide. Terrace naming is based on literature [2,3], unless otherwise specified by the farming systems. authors of the photos. Each structure provides a different mix of the three ecohydrological Stream buffers **FUNCTIONS** Drainage ditches France •Slope terraces • Zig © IRD – Thierry Ruf terraces Ecuador Routing Infiltration water drainage soil retention Storing water harvesting

**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.



Timor-Leste

Pakistar

Tunisia

Tiered rice

paddies



Italy

Morocco

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

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)

Terra-preta raised beds

channels

Shaping shape and earthwork renovation

Bolivia

section

Ditching

cleaning (e.g.

and sediment

management)

vegetation

Senegal

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.



STRUCTURES

Cross-slope structures and barriers: bench terraces, stone lines and bunds, check dams, silt fences

Stone trench bunds, Drainage uphill subsurface stone reservoirs, micro-(e.g. *acequias*) water storage

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[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 Paper ID 109848 [4] Gras et al. (1989) Le Fait technique en agronomie: activité agricole, concepts et méthodes d'étude, Ed. L'Harmattan, Paris



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