

# Concept Note: Agualiciosa – Rehydrating the Global Dryland Frontier

**Mission Statement:** Agualiciosa is dedicated to restoring Iberia’s “soil-water sponge” through community stewardship and Nature-Based Solutions (NbS). By leveraging natural processes to address water-related challenges, we ensure our rural landscapes remain a testament to hope and resilience in a changing climate.

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## 1. The Silent Crisis and the Cost of Inaction

The Iberian Peninsula is a global climate hotspot where shifting rainfall patterns of intense, erosive bursts fail to replenish aquifers and instead cause destructive flash floods. As author Douglas Hughes describes, historical channel incision has “unplugged” the landscape, lowering groundwater tables and leaving the countryside a tinderbox. The European Commission’s Joint Research Centre frames this as a WEF Nexus challenge (Water-Energy-Food-Ecosystems), in which the collapse of one element triggers the failure of the others.

**The Price of Silence:** According to the European Environment Agency, more than 75% of Spain and 60% of Portugal face the risk of irreversible desertification, driving biodiversity loss for species like the Iberian lynx, mass rural depopulation, and the transformation of degraded wetlands from carbon sinks into active carbon sources.

**The Cost of Policy Inaction:** Under the EU Nature Restoration Law (Regulation 2024/1991), restoring these systems is now a legally binding mandate covering 20% of EU land by 2030.

## 2. The Solution: Natural Infrastructure in Dryland Streams (NIDS)

Agualiciosa stands in a deep Iberian tradition. In 1889, the Cartagena forestry engineer Ricardo Codornú, the “Apóstol del Árbol,” began the reforestation of Sierra Espuña after the catastrophic floods of the 1880s, pioneering what he called *restauración hidrológico-forestal*: check dams, vegetation studies, and patient soil recovery over decades. We pick up where he left off, with modern tools and the same conviction.

Our work uses Natural Infrastructure in Dryland Streams (NIDS): low-tech, process-based structures of rock, wood, and mud. Research by Laura Norman and colleagues shows these structures mimic natural geomorphic processes to slow drainage and facilitate infiltration, functionally identical to the “hydro-morphological restoration” mandated by the EU Water Framework Directive.

- **Hand-Built Stability:** One-Rock Dams (ORDs), Zuni Bowls, and Media Lunas stabilize channels and dissipate runoff energy, functioning as semipermeable membranes that promote deep groundwater recharge.
- **Autogenic Recovery:** Following Steven Whisenant’s methods, structures initiate “self-repair” processes that require no continuing management subsidies. As the LTPBR Manual puts it, we “let the water do the work.”
- **Teal Carbon Sinks:** As documented in *Science of the Total Environment*, rehydrated valley bottoms sequester 200–1,400 metric tons of organic carbon per hectare.

## 3. Community Strategy: 100% Volunteer Stewardship

The battle against desertification must be “fought with spades and seeds.” By turning residents into empowered guardians, this model reverses the cultural spiral of decline and roots restoration in the people who live with its outcomes.

- **Labor Weekends:** The project is powered entirely by volunteer labor, using short-term events to restore headwater networks at meaningful scale.
- **Accessible Restoration:** Per USDA-NRCS Technical Note 40, while experts handle design and oversight, physical implementation is fully accessible to non-experts working in optimal groups of 4–5 per structure.
- **The Art of Stewardship:** Volunteers are trained in “Site Reading” (*relève*), a method of skilled observation that teaches them to recognize clues in landform and vegetation.
- **Legacy Projects:** Hands-on restoration takes on a life of its own, with community members returning annually to witness the results of their own labor.

#### 4. Targeted Scale and Intensity

To trigger watershed-scale recovery, Agualiciosa adopts evidence-based benchmarks from successful North American dryland restoration:

- **Intensive Watershed Approach:** Following the Turkey Pen Watershed (Arizona), where over 2,000 structures treated 769 hectares (~2.6 structures/ha).
- **Habitat Restoration Density:** The Nature Conservancy's Gunnison Basin work used 385 one-rock dams to restore 20 hectares along 13.7 stream kilometers.
- **Network Saturation:** Target density is 15–20 structures per stream kilometer for initial stabilization, scaling to thousands across the headwater network to reach hydrological tipping points.
- **Phased Strategy:** Per the LTPBR framework, low-tech restoration is iterative; it is “okay to be messy,” and multiple treatments may be necessary to achieve a self-sustaining riverscape.

#### 5. Impact Timeline: Measurable Outcomes

- **Years 1–2 (Stabilization):** Immediate sediment retention and localized soil moisture increases of ~10% (Fandel field measurements).
- **Years 3–5 (Transformation):** A 20% increase in native wetland plant cover and NDVI “greenness” boosts of up to 25% (Silverman et al., satellite imagery).
- **Years 5–7+ (Resilience):** Restoration of perennial flows and at least 4% contribution to alluvial aquifer recharge over baseline.

#### 6. Accountability: The IUCN Global Standard

Agualiciosa aligns with the IUCN Global Standard for Nature-Based Solutions and the REACTION evaluation protocol for the Northern Mediterranean. As outlined by Marijuan and colleagues, we employ outcome-based monitoring for transparent evidence of success. Per researchers Bautista and Vallejo, success is measured by erosion control, increased land productivity, and socio-economic benefits, and Mediterranean case studies show investment costs are typically repaid through ecosystem services within five years.

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*Our work follows the ethics of Aldo Leopold, who believed a thing is “right” when it preserves the integrity, stability, and beauty of the biotic community, honoring even the small things, like the Draba flower, the “postscript to a hope.”*

**Vision Statement:** *“A global future where every headwater watershed is a refugia of biodiversity and every community is an empowered guardian of its land, ensuring rural landscapes everywhere remain a flourishing testament to resilience in a changing climate.”*

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