

# Hydrological Tools for Restoration in Drylands - Twinning Studies in Southern Europe and Africa

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### **Local and Site-Specific Ecohydrological Indicators of Desertification**

- Decrease of soil water storage (medium pores): Proposed concept of Wetness Duration Curve
- Change in water-related biogeochemical products: carbon, salts, nutrients, earth-alkaline vs. alkaline ions
- Change in clay content and sorption capacity
- Loss of soil structure and alteration of soil water retention curve

### **Regional and Basin-Specific Ecohydrological Indicators of Desertification**

- Increase of surface flow, decrease of infiltration, seepage and recharge
- Increase in erosion and sediment transport
- Decrease of groundwater levels
- Decrease of areas with groundwater-dependent ecosystems
- Decrease of lake volume and extent
- Decrease of wetland area

# Hydrology and Desert Restoration

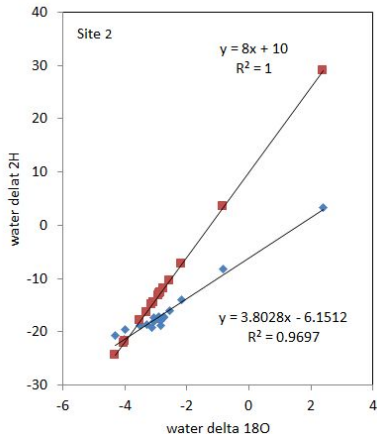
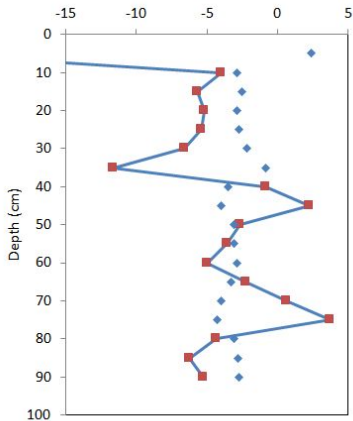


Figure 1: Isotope studies to investigate aridity at site scale in Portugal

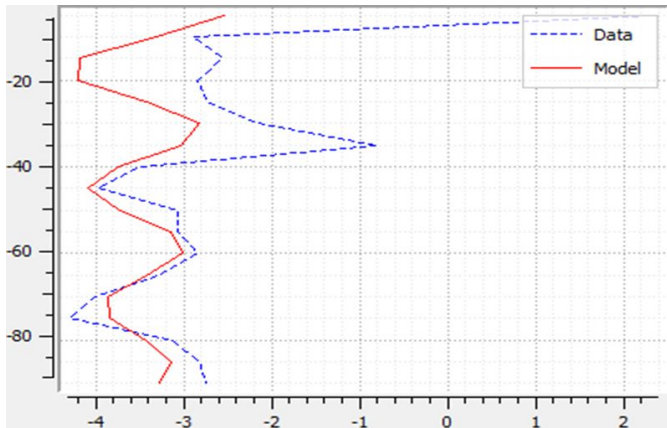


Figure 2: Isotope profiles indicate velocity of water movement



Figure 3: Isotope Profiles on a series of Welwitschia plant sites analyzed

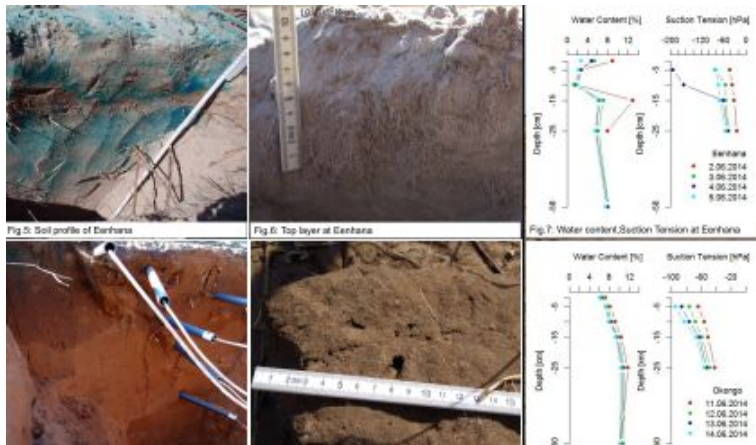
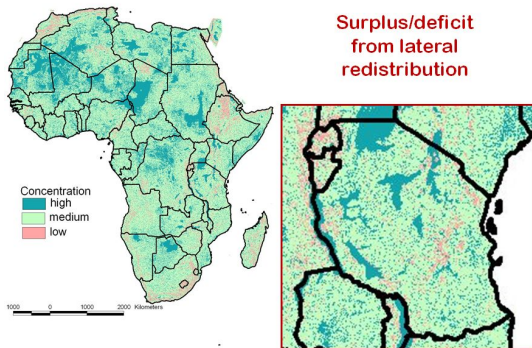


Figure 5: Recharge of Cuvelai region between Namibia and Angola

## Regional Scale Approaches and Spatial Relations





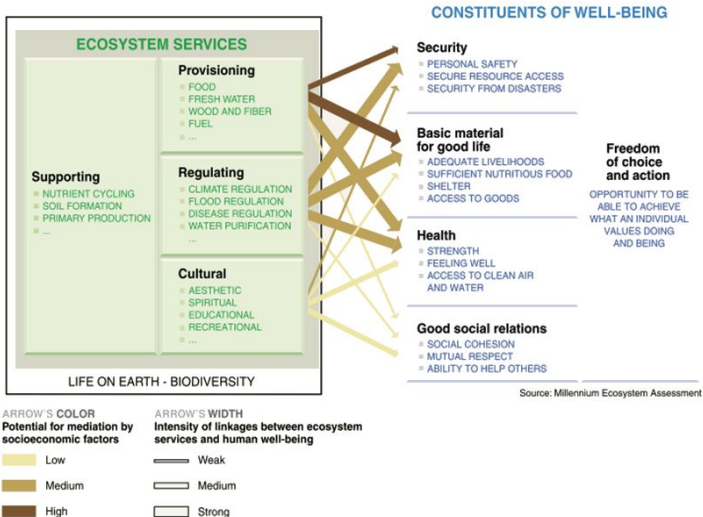


Figure 6: Define natural and measurable services, MEA, 2013

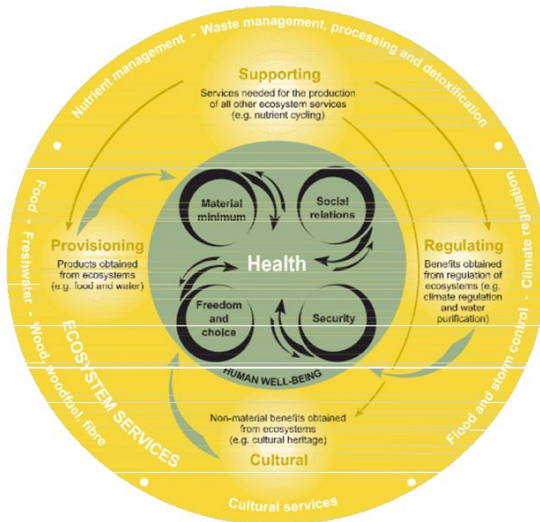


Figure 7: Environmental health as benchmark, MEA, 2013