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المركز الوطني لتنمية
الغطاء النباتي ومكافحة التصحر
National Center for Vegetation Cover
Development & Combating Desertification



WOCAT

وزارة البيئة والمياه والزراعة
Ministry of Environment Water & Agriculture



Sustainable Land Management Framework

24 Sustainable Land Management Technologies and Approaches — Kingdom of Saudi Arabia

17th Session of the Conference of the Parties to the United Nations
Convention to Combat Desertification (COP17)

Ulaanbaatar, Mongolia | 17–28 August 2026



SA - SLM

The SLM Framework and Its Objective

What is Sustainable Land Management?

The use of land resources — including soil, water, animals and plants — to produce the goods needed to meet changing human needs, while ensuring the long-term productive potential of these resources and safeguarding their environmental functions at the same time.

About the Framework

Saudi Arabia's Sustainable Land Management Framework was developed under an agreement between FAO and WOCAT, in partnership with NCVG and the Ministry of Environment, Water and Agriculture, to strengthen sustainable land management nationwide and create a platform bringing together government, NGOs and local communities.

Objective

Promoting innovative SLM technologies and practices to prevent, reduce and reverse land degradation, strengthen ecosystem resilience and support environmental sustainability — aligned with Saudi Vision 2030 and the Kingdom's environmental and climate initiatives, including the Saudi Green Initiative.

1

Framework Development

Assessing land degradation, identifying good technologies and practices, and developing an evidence-based framework.

2

Capacity Building

Identifying training needs and designing and delivering training courses for partner and stakeholder institutions.

3

Documentation and Knowledge Exchange

Documenting, reviewing and publishing good technologies and approaches on the global SLM database and a national electronic platform.

Water Harvesting and Wadi Rehabilitation

Harvesting surface runoff and floodwater to rehabilitate wadis and green degraded land. (7 technologies)



WOCAT 7806

Technology

Integrated wadi rehabilitation technique: protection and water harvesting in dryland environments — Al-Safarat Park

An integrated wadi-rehabilitation technique combining environmental protection and water harvesting to improve water-resource management in dryland areas. Applied in Al-Safarat Park, Riyadh, to reduce erosion, regulate runoff, and improve rainwater collection —also improving vegetation cover and soil and groundwater recharge in degraded wadis.

<https://wocat.net/en/database/technologies/7806/pdf/>

WOCAT 7813

Technology

Slowing surface runoff through stone terraces and organized afforestation in Wadi Al-Faqi — Shuayb Al-Mahalib Park

A soil- and water-conservation technique building small stone terraces/barriers across runoff channels and micro-slopes to slow floodwater, boost sediment deposition, and improve infiltration and soil moisture —then reinforced with organized native afforestation along channels and stable terraces.

<https://wocat.net/en/database/technologies/7813/pdf/>



WOCAT 7808

Technology

Ecological wadi engineering and smart water-harvesting techniques to restore vegetation cover in hyper-arid areas — Al-Sahwa National Park

Ecological protection and rainwater harvesting in wadis to restore vegetation cover in hyper-arid areas, reducing grazing and vehicle pressure, boosting water retention and soil moisture, and activating natural regeneration. Results show improved vegetation cover, productivity and greening, with less degradation.

<https://wocat.net/en/database/technologies/7808/pdf/>

WOCAT 7815

Technology

Restoring vegetation cover in wadis using rainwater-harvesting techniques — Abu Al-Fuhayhil Open Park, Riyadh

An integrated technique restoring vegetation cover in dry wadis through fencing, native afforestation, and rainwater-harvesting methods (stone barriers, micro-catchments) —boosting soil moisture, ecological stability and biological productivity.

<https://wocat.net/en/database/technologies/7815/pdf/>



WOCAT 7556

Technology

Dry farming using rainwater-harvesting arcs on mountain slopes

Vegetation cover is increased using semi-circular (crescent) rainwater-harvesting arcs built with the 'duck's foot' method, paired with dry farming of native species —improving rainwater-use efficiency and raising success rates to around 80%.

<https://wocat.net/en/database/technologies/7556/pdf/>

WOCAT 7845

Technology

Interactive ecological restoration of dry rocky wadis using rainwater-collection platforms and integrated afforestation — Al-Buhaytah National Park

An institutional technique for sustainable land management aims to restore the dry rocky valleys in Al-Bahita National Park by integrating protection, rainwater harvesting, and afforestation with native plant species, along with the application of environmental monitoring using remote sensing, field verification, and adaptive management, which contributes to restoring vegetation cover, improving ecosystem functions, and increasing resilience to desertification and climate change.

<https://wocat.net/en/database/technologies/7845/pdf/>



WOCAT 7260

Technology

Cross-wadi water-harvesting structures

Cross-wadi structures are built from local stone to slow the flow of runoff. These water-harvesting walls reduce the severity of storm flow, causing sedimentation and a rise in the water table. Productive trees can then be planted on site.

<https://wocat.net/en/database/technologies/7260/pdf/>

Afforestation and Vegetation Cover Restoration

Planting resilient trees to stabilize soil and rebuild vegetation cover in arid environments. (5 technologies)



WOCAT 7807

Technology

Multi-layered graduated afforestation to enhance vegetation-cover stability in dryland environments — Al-Jumum National Park

Multi-layered afforestation in Al-Jumum National Park is an ecological-engineering approach transforming dryland into sustainable green systems by planting trees, shrubs and plants in layers, with smart irrigation and engineered distribution. It stabilizes soil, cuts dust and heat, conserves water, supports biodiversity, and boosts eco-tourism — though costs, water needs and specialized staff remain challenges.

<https://wocat.net/en/database/technologies/7807/pdf/>

WOCAT 7810

Technology

Salinity-tolerant afforestation and ecological gradation to enhance vegetation-cover stability in desert environments — Al-Asfar Lake Forest

Seedlings of highly salinity-tolerant species are planted directly into the water table beneath marshes, lakes and salt flats around Al-Ahsa Oasis, eastern Saudi Arabia, at a depth of roughly 120-60 cm.

<https://wocat.net/en/database/technologies/7810/pdf/>



WOCAT 7858

Technology

Protected Afforestation and Habitat Development in Hyper-Arid Wadis — Huraymila Park

A land-restoration technique applied in Huraymila National Park, combining site protection, native planting, and planting pits/basins that support seedlings and capture rainwater and runoff — improving habitats, reducing human and grazing pressure, and restoring vegetation cover, regeneration and biodiversity.

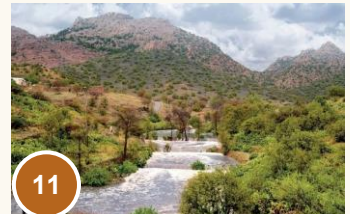
<https://wocat.net/en/database/technologies/7848/pdf/>

Technology

Site-Based Afforestation in Mountainous Environments — Taif National Park

Site-based afforestation with native species in degraded mountainous locations — selecting suitable sites, planting and tending seedlings, and protecting/managing the site to support natural regeneration and habitat restoration. Improves vegetation cover, reduces erosion, and enhances biodiversity in Taif National Park (Hima Sisad).

<https://wocat.net/en/database/technologies/7851/pdf/>



Technology

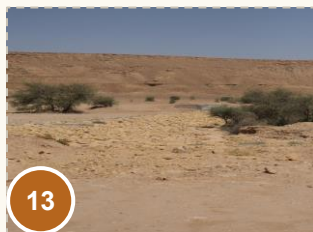
Tree-Planting Pits in Arid Areas

Tree-planting pits are rainwater-harvesting structures that capture surface runoff to feed trees and shrubs. These pits receive additional water until seedlings are well established. Planted species are native, providing shade and honey.

<https://wocat.net/en/database/technologies/7380/pdf/>

Ecosystem & Habitat Restoration, Soil & Water Conservation

Restoring degraded ecosystems and habitats, and conserving soil and water to support natural regeneration
. (4 practices and 3 technologies)



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WOCAT 7806

Approach

Replicable ecosystem restoration based on zoning into ecological units in arid areas — King Salman bin Abdulaziz Royal Reserve

An integrated wadi-rehabilitation technique combining environmental protection and water harvesting to improve water-resource management in dryland areas. Applied in Al-Safarat Park, Riyadh, to reduce erosion, regulate runoff, and improve rainwater collection — also improving vegetation cover and soil and groundwater recharge in degraded wadis.

<https://wocat.net/en/database/approaches/7806/pdf/>

WOCAT 7811

Geoparks Initiative — Thadiq Park

Approach

A project-based, locally rooted rehabilitation approach led by NCVC in Thadiq National Park / North Riyadh Geopark, combining rainwater harvesting, native planting, supplemental irrigation, protection, technical advice and community participation —reclaiming degraded arid land while supporting conservation, education, tourism and local livelihoods.

<https://wocat.net/en/database/approaches/7811/pdf/>



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WOCAT 7808

Approach

Smart adaptive ecological restoration approach for dryland ecosystems — Qassim National Park

A participatory, institutional approach to adaptive ecosystem restoration in dryland areas, based on site-assessment planning, stakeholder coordination, guided implementation of SLM techniques, and linking monitoring to decision-making —improving interventions and the sustainability and scalability of outcomes.

<https://wocat.net/en/database/approaches/7808/pdf/>

WOCAT 7823

Interactive ecological restoration approach for dry wadi management — Al-Buhaytah National Park

An integrated ecological restoration approach rehabilitating degraded ecosystems in Al-Buhaytah National Park through protection, native afforestation, improved site management, and remote-sensing monitoring with field verification —enhancing biodiversity, soil stability, ecosystem services and land sustainability.

<https://wocat.net/en/database/approaches/7823/pdf/>



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WOCAT 7814

Technology

Large-scale assisted natural regeneration and soil and water conservation in drylands — Thadiq Park

A large-scale dryland restoration technique supporting natural regeneration and protecting degraded sites —slowing runoff and capturing soil and sediment via check dams, wadi walls and water-harvesting pits, then reinforcing vegetation with native species through nursery production, enrichment planting and supplemental irrigation.

<https://wocat.net/en/database/technologies/7814/pdf/>

WOCAT 7811

Technology

Rehabilitation of gravel plains through passive protection and assisted natural regeneration — Abu Samra National Park

A technique for rehabilitating degraded gravel plains in Abu Samra National Park through passive protection and assisted natural regeneration, with selective native afforestation and rainwater/runoff management —restoring vegetation cover, soil stability and biodiversity.

<https://wocat.net/en/database/technologies/7811/pdf/>



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WOCAT 7419

Technology

Irrigating desert plants by reusing plastic liquid-fertilizer containers

Liquid-fertilizer containers are recycled as water reservoirs for irrigation, collected from agricultural partners and reused at planting sites. Community members fit a wick beneath each container and place it beside a tree for continuous irrigation, refilled periodically. Implemented under the Wadi Al-Ghuwail rehabilitation project by civil society.

<https://wocat.net/ar/database/technologies/7419/pdf/>

Participatory Community Restoration

Engaging local communities and park authorities in planning and implementing restoration work. (3 approaches)

WOCAT 7812

Approach



Community-participation restoration approach under the NCVC protection project — Abu Samra National Park

A participatory ecological restoration approach based on protection and natural regeneration in Abu Samra National Park, combining low-cost interventions (fencing, protection, limited afforestation, water harvesting) with community involvement in protection and management —strengthening vegetation cover and restoring ecosystem functions in dryland areas.

<https://wocat.net/en/database/approaches/7812/pdf/>

WOCAT 7807

Approach

Afforestation approach targeting 2,500 hectares reclaimed in support of the Saudi Green Initiative

The General Irrigation Corporation's afforestation approach represents an integrated institutional framework for land reclamation and increasing vegetation cover in arid environments, through planning, coordination, resource mobilization, and the application of technologies appropriate to site conditions, while utilizing non-conventional water and renewable energy, building capacities and partnerships, and following up on implementation and expanding the application of successful practices until 2030. <https://wocat.net/en/database/approaches/7807/pdf/>



WOCAT 7824

Approach

Habitat restoration approach based on park management and community participation — Huraymila National Park

An institutional, participatory approach to habitat restoration in Huraymila National Park, combining protected-area management, evidence-based planning, community engagement, native afforestation, and ongoing protection and monitoring —restoring ecosystem functions and strengthening land sustainability in dryland areas.

<https://wocat.net/en/database/approaches/7824/pdf/>

Sand Dune Stabilization

Protecting land, infrastructure and communities from shifting sand dunes. (2 Technologies)

WOCAT 7629

Technology

Sand-fixation technique using dry palm fronds on sand dunes — near Al-Asfar Lake

Around Al-Asfar Lake in Al-Ahsa, dry palm fronds were bundled and fixed in squares or rows to break wind force and trap moving sand. The method is a natural, low-cost, effective means of dune fixation, protecting the lake and surroundings, farms, roads and the local environment.

<https://wocat.net/en/database/technologies/7629/pdf/>



WOCAT 7809

Technology

Rainwater catchment pits — semi-circular (crescent) — for planting Markh shrubs among sand dunes

A rainwater-harvesting technique using semi-circular, crescent-shaped pits dug between sand dunes to direct and collect surface runoff, supporting the planting of Markh shrubs (*Leptadenia pyrotechnica*) and sand stabilization.

<https://wocat.net/ar/database/technologies/7809/pdf/>