Food and Agriculture Organization of the United Nations

وزارة البيئة والمياه والزراعة
Ministry of Environment Water & Agriculture

Cross-Wadi Walls in Arid Zones in the Kingdom of Saudi Arabia




Food and Agriculture Organization of the United Nations
–Riyadh, 2025

Cross-Wadi Walls in Arid zones in the Kingdom of Saudi Arabia

Food and Agriculture Organization of the United Nations
–Riyadh, 2025

Required citation:
Éric Lacroix et al. 2025. Cross-Wadi Walls in Arid Zones in the Kingdom of Saudi Arabia. Riyadh, Saudi Arabia, FAO-KSA.

Authors: Sami Albarih, Yahya Alotibi, Nabeel Boudi, William Crtichley, Mona Dabelwait, Njeru Jeremiah Gitonga, AbdelHamied Hamid, Adalhaleem Hassaballa, Steve Kamerino, Éric Joseph Lacroix, Mosaed Majrashi, Rima Mekdaschi.

Contents

Figures

Foreword

Saudi Arabia has recently launched ambitious initiatives and programmes to increase vegetation cover in the country through the rehabilitation, restoration and sustainable management of its natural rangelands, protected areas and natural forests, including the mangrove forests along its coastal areas. The Saudi Green Initiative, a cornerstone of the country's climate and environmental action, has three overarching targets: emissions reduction, afforestation, and land and sea protection. Among its specific targets is the planting of 10 billion trees across the country.

One of the key initiatives contributing to the implementation of the Saudi Green Initiative is the National Greening Program. The programme focuses on utilising the country's wide variety of native plant species for afforestation activities across 13 regions. The programme also aims to build bridges of cooperation between the public, private and non-profit sectors for the preservation of environmental integrity and natural resources in the country.

To achieve the ambitious objectives of the Saudi Green Initiative, national institutions have made substantial investments to enhance the production capacity of existing nurseries and to establish new ones across the Kingdom. These facilities are recognised as essential infrastructure for the restoration and rehabilitation of degraded lands, providing the foundation for successful vegetation recovery. In parallel, and consistent with the goals of the National Greening Program, engagement of all relevant non-state actors—including the private sector, community groups, and nonprofit organisations—is encouraged to promote the large-scale propagation of native trees and shrubs. This collaborative approach aims to ensure a sustainable and continuous supply of high-quality seedlings to support nationwide tree-planting activities and ecosystem rehabilitation efforts.

This technical document, prepared under the FAO–Saudi Sustainable Rural Agricultural Development (SRAD) Programme, contributes directly to these national objectives. It serves as a practical reference for planners, park managers, and field technicians by offering clear, step-by-step guidance on the design, establishment, and management of cross-wadi walls in arid zones. The approach outlined herein is based on field experience and scientific evidence, ensuring that restoration initiatives across the Kingdom of Saudi Arabia achieve both ecological and operational effectiveness.

Dr Nizar Hadad
FAO Saudi Arabia Programme Director

Acknowledgements

The Food and Agriculture Organization of the United Nations expresses its sincere Sami Albarih, Nabeel Boudi, Mona Dabelwait, Mosaed Majrashi, Rima Mekdaschi, William Critchley, Jeremiah Njeru Gitonga, Adalhaleem Hassaballa, Abdel Hamied Hamid, Steve Kamerino, and Éric Joseph Lacroix, the compiler, whose contributions and technical expertise were instrumental in the preparation of this publication.

The Organization also acknowledges the valuable participation of the field teams of the National Center for Vegetation Cover Development and Combating Desertification (NCVC), whose dedication in documenting and implementing the tree plantation pit technique has greatly enhanced the quality and practical relevance of this guide. Appreciation is also given to Mafaz Punjabi for layout and graphic design.

Abbreviations

FAO	Food and Agriculture Organization of the United Nations
MoEWA	Ministry of Environment, Water and Agriculture
NCVC	National Centre for Vegetation Cover Development and Combating Desertification
SLM	Sustainable Land Management
SRAD	Sustainable Rural Agricultural Development Programme
USD	United States Dollar

Executive Summary

The cross-wadi wall technology represents a pioneering solution for water and soil management in the Kingdom of Saudi Arabia's arid and hyper-arid environments. Developed by Abdulla Al Eissa, and supported under the FAO–Saudi Sustainable Rural Agricultural Development (SRAD) Programme and the National Center for Vegetation Cover (NCVC), the approach combines simple structural engineering with ecological restoration to address flash flooding, erosion, and land degradation in wadis. The technique consists of building low dry-stone or partially cemented walls—ranging from 0.5 to 2 metres in height—across ephemeral wadis to slow down runoff, trap sediments, and increase groundwater recharge. Over time, these structures transform dry, eroded channels into vegetated green corridors capable of sustaining native species and supporting long-term ecosystem recovery.

Since 2020, one hundred twenty cross-wadi walls have been established, primarily in Thadiq National Park and the North Riyadh UNESCO Global Geopark. Each wall is strategically sited and dimensioned to maximise water retention and sediment accumulation. The captured runoff promotes infiltration, reduces downstream flooding, and provides sufficient moisture for the plantation of native trees such as *Vachellia tortilis*, *Vachellia gerrardii*, and *Ziziphus spina-christi*. These species enhance soil stability, biodiversity, and microclimate regulation, creating favourable habitats for pollinators, birds, and small mammals. The technology integrates seamlessly with Saudi Arabia's Vision 2030 and the Saudi Green Initiative, both of which prioritise afforestation, biodiversity enhancement, and climate adaptation.

Construction involves locally available materials and basic equipment, ensuring cost-efficiency and replicability. Once built, the walls require limited upkeep—mainly inspection and minor repairs after floods—while their ecological benefits continue for decades. Socio-economically, the system creates seasonal employment, promotes apiculture, and encourages community participation in environmental stewardship. Ecologically, it restores degraded rangelands, reduces erosion, enhances groundwater recharge, and contributes to carbon sequestration and land-degradation neutrality.

Field experience underlines key success factors: accurate siting, proper levelling to maintain horizontality, phased construction, and post-flood maintenance. The integration of vegetation and structural measures ensures both hydraulic stability and ecological recovery. With strong community engagement and technical support from FAO and NCVC, cross-wadi walls have become a recognised best practice for sustainable land management in Saudi Arabia's protected areas. They provide a proven, scalable, and climate-resilient model for restoring degraded wadis and achieving the Kingdom's long-term environmental and socio-economic objectives.

1. Description

1.1. General

Cross-wadi walls, also known as progressive micro-terraces, are dry-stone, sometimes cement-reinforced, structures built across wadis to slow down surface ephemeral runoff, trap sediments, and enhance groundwater recharge. The technology aims to harvest and store runoff water to support tree plantation and ecosystem rehabilitation in hyper-arid, to semi-arid environments of the Kingdom of Saudi Arabia. These low, perfectly horizontal walls—typically 0.5 to 2 metres high and 5 to 200 metres long—are constructed from locally available limestone and sealed with soil or occasionally a thin cement layer on the upstream side (invisible) to ensure watertightness. By reducing the velocity of flash floods and promoting sediment deposition upstream, they create favourable micro-conditions for the establishment of native trees such as *Vachellia tortilis, Vachellia gerrardii* and *Ziziphus sp.*, which help stabilise the soil, increase vegetation cover and provide fodder, nectar and shade. The structures are implemented mainly within the National Parks managed by the National Center for Vegetation Cover (NCVC) with technical guidance from the FAO-Saudi Sustainable Rural Agricultural Development (SRAD) Programme. A hundred and twenty cross-wadi walls have been established since 2020 in Thadiq National Park and the North Riyadh UNESCO Global Geopark, where they demonstrate effective water harvesting, reduction of downstream flooding, and visible regreening within a few years.

Figure 1. Cross-wadi wall (50 cm high), Thadiq National Park. (© Éric Lacroix)

1.2. Water and soil

The cross-wadi wall system is specifically designed to harvest and retain surface runoff generated by short, intense rainfall events typical of Saudi Arabia's hyper-arid, to semi-arid regions. These wadis, normally dry for most of the year, experience sudden flash floods that carry valuable water and sediments downstream. By intercepting this flow, the walls slow down the water velocity, promote sediment deposition upstream, and increase infiltration into the underlying soil layers. The accumulated water forms temporary ponds after heavy rains, which gradually percolate into the soil profile, recharging shallow aquifers and maintaining soil moisture for several weeks or months depending on rainfall intensity and sediment depth.

The effectiveness of each structure depends on its siting, spacing, and alignment with the natural flow of the wadi. A sequence of walls spaced at appropriate intervals creates a cascading effect that distributes runoff evenly along the valley floor, reducing peak discharge and erosion while enhancing the total storage capacity of the system. Water stored behind the walls supports the establishment of vegetation and tree plantations, particularly *Vachellia* and *Ziziphus* species, which develop deep roots capable of accessing the recharged groundwater (5 to 50 meters deep).

Although the system relies entirely on natural rainfall, maintenance of the hydraulic efficiency of the walls is crucial. After major floods, accumulated debris or sediment may need to be removed to restore the wall's capacity. In certain cases, shallow pits or basins are dug just upstream of the wall to facilitate infiltration and tree planting. Over time, as vegetation cover increases, evapotranspiration and infiltration rates stabilise, and the wadi gradually transitions into a self-sustaining green corridor that retains moisture long after the rainy season.

Figure 2. Cross-wad wall with tower and wings with a < 1 meter wall in Thadiq National Park (© Éric Lacroix)

1.3. Developer

The technical design was developed by park manager Abdulla Al Eissa, while FAO provided guidance on site selection, spacing, scheduling, fertilisation, and planting under the project *Strengthening MoEWA's Capacity to Implement its Sustainable Rural Agricultural Development (SRAD) Programme* (UTF/SAU/051/SAU, 2019–2025). Funding is shared between the NCVC and local contributors, including donors and volunteers.

Figure 3. Cross-wadi wall (50 cm high), in Thadiq National Park (© Éric Lacroix)

1.4. Location

The technology was implemented in Thadiq National Park, Riyadh Province (Region), the Kingdom of Saudi Arabia — a protected landscape of about 148 km² managed by the National Centre for Vegetation Cover Development and Combating Desertification (NCVC). The representative site selected for documentation lies at 25.1689°N and 45.94174°E. The area was chosen for its accessibility, hydrological potential, and suitability for vegetation recovery. Activities were carried out jointly by NCVC field teams, FAO technical experts, and local volunteers.

Figure 4. Cross-wadi wall, (50 cm high), with a cave for tourists to rest in the shade, in Thadiq National Park (© Éric Lacroix)

1.5. Natural Environment

Thadiq National Park lies within the central plateau of the Kingdom of Saudi Arabia and has an arid to hyper-arid climate. Average annual rainfall is around 70 mm, occurring mainly from November to April in short, intense storms that generate surface runoff — the key source of water captured by the cross-wadi walls. Summers are extremely hot, with daytime temperatures exceeding 45 °C, while winters are mild, averaging about 20 °C. The climate is classified as a hot desert, with high evaporation (over 3 metres annually) and low humidity (average 10 %).

The landscape consists of gently undulating plateaux intersected by wadis and small wadis (*sheyhib*). Elevation ranges from 100 m to 1,000 m a.s.l., and most plantation sites lie on flat terrain with slopes below 2 %. Soils are shallow (0–20 cm), coarse-textured and sandy, offering good infiltration but limited water retention. Organic-matter content is generally below 1 %, reflecting low biological activity typical of desert ecosystems. The groundwater table lies at depths between 5 m and 50 m. Flooding occasionally occurs after heavy rain but contributes valuable sediment and moisture to the pits.

Vegetation is sparse and dominated by xerophytic shrubs and scattered trees such as *Vachellia tortilis*, *Ziziphus spina-christi*, and *Haloxylon salicornicum*. Habitat diversity is limited by aridity but has improved significantly in rehabilitated areas, where the increased vegetation cover supports pollinators, birds, and small mammals with foxes, wolves, hyenas, honey badger, feral donkeys, stray dogs, wild cats, hedgehogs and rehabilitated gazelles.

Figure 5. Cross-wadi wall, (50 cm high), in Thadiq National Park with tower and wings (© Éric Lacroix)

1.6. WOCAT Classification of the Technology

Cross-wadi walls are classified under Sustainable Land Management (SLM) as a combined water- and soil-harvesting, flood-control, and vegetation-restoration technology. The system integrates structural and vegetative measures to reduce land degradation, conserve water and soil, and enhance biodiversity in arid and hyper-arid environments.

The structural component consists of building low dry-stone walls across wadis to intercept runoff, trap sediments, and facilitate groundwater recharge. These structures act as small check dams, stabilising the wadi bed and improving local hydrology. The vegetative component involves the establishment of native trees and shrubs—mainly *Vachellia tortilis*, *Vachellia gerrardii*, and *Ziziphus sp*.—on the upstream side of the walls, where moisture and nutrient accumulation create favourable conditions for growth. Together, these measures enhance infiltration, reduce erosion, and promote natural regeneration along wadi systems.

The technology also provides socio-economic benefits through improved vegetationupstre

productivity, apiculture, and ecotourism within protected areas. It directly supports climate-change adaptation by reducing flood damage, mitigating drought impacts, and restoring degraded ecosystems. Cross-wadi walls contribute to the Vision 2030 goals of increasing vegetation cover and achieving land-degradation neutrality in the Kingdom of Saudi Arabia.

2. Establishment, Maintenance and Costs

The establishment of cross-wadi walls involves several coordinated steps carried out during the dry season, when wadis are accessible for construction. The process requires careful planning, surveying, and design to ensure proper alignment and spacing between structures. Activities include site selection, marking, excavation, stone collection, wall construction, and post-construction inspection. Each wall is designed according to the wadi's width, slope, and hydrological behaviour to achieve maximum water-harvesting efficiency while maintaining structural stability.

Construction materials consist mainly of locally available limestone and gravel. Large foundation stones are placed first, followed by smaller stones and compacted soil to fill gaps. In some cases, a thin layer of cement is applied on the upstream face to increase water retention and prevent seepage. After completion, the site is checked for level accuracy and compactness before the first rainy season. Tree planting is then carried out upstream (and some downstream) of the structure once sediments and moisture have accumulated.

Maintenance involves periodic inspection, particularly after heavy rains or flash floods, to detect damage, remove debris, and ensure that water flow remains evenly distributed. Accumulated sediments are left in place as they improve soil fertility and water-holding capacity, but major obstructions near the crest or flanks are cleared to maintain water passage. Repairs may include reinforcing eroded sections, replacing displaced stones, or resealing cracks.

Costs are calculated per wall or per hectare of treated wadi. They include labour for construction and maintenance, use of excavators and transport vehicles, and, where applicable, costs of seedlings and community participation. Although establishment expenses are relatively high due to the need for stonework and machinery, long-term maintenance costs remain low, as the structures are durable and largely self-sustaining. The overall cost-effectiveness of the system is justified by its multiple benefits—reduced flooding, increased groundwater recharge, improved vegetation cover, and enhanced ecological and economic resilience.

2.1. Technical Drawings and Layout

Figure 6. Design of a *cross-wadi wall*: a wall and two towers (© FAO/Éric Lacroix).

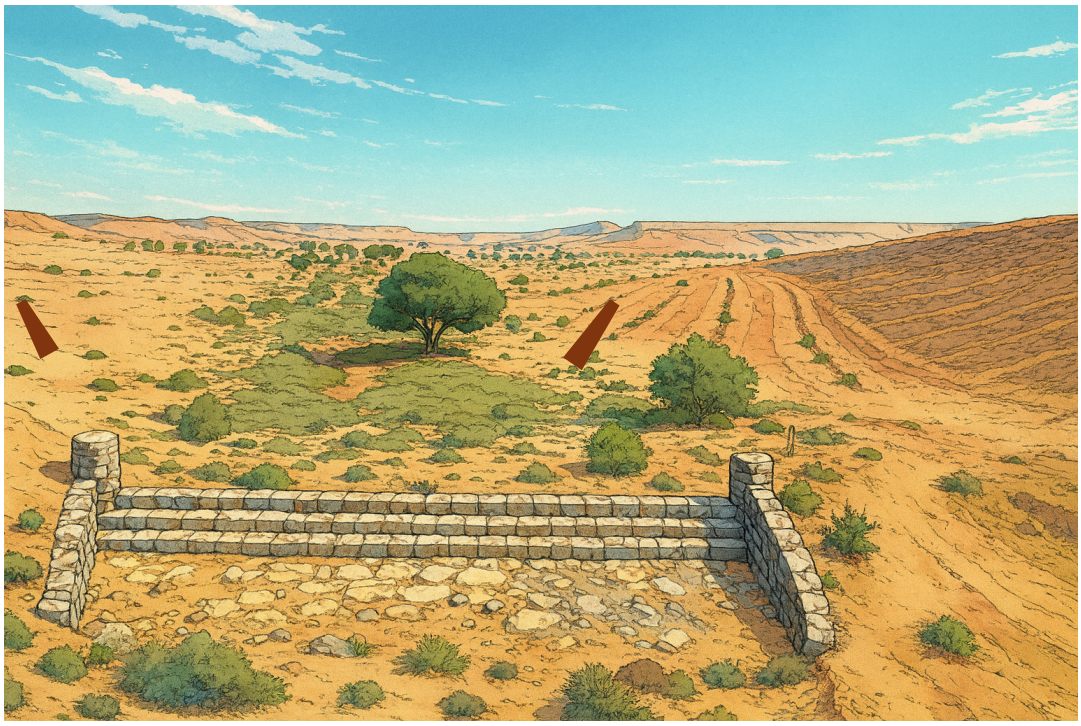

Figure 7. Design of a *cross-wadi wall*: after, you add the two wing-walls (brown) (© FAO/Éric Lacroix).

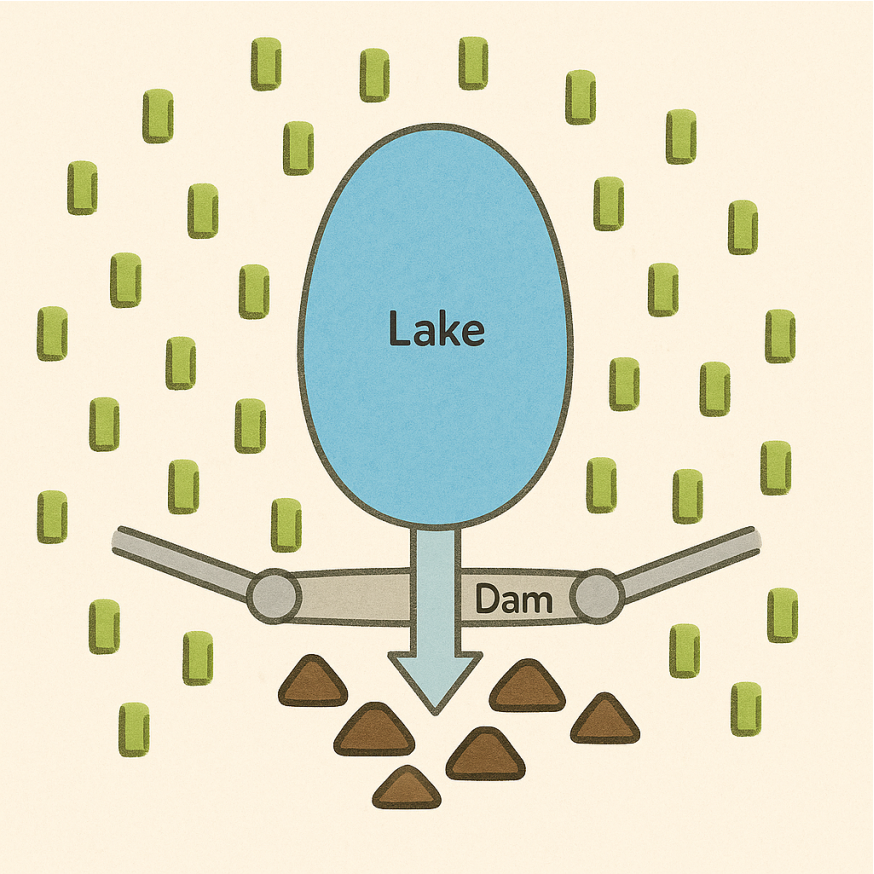

Figure 8. Design of a *cross-wadi wall* with plantation pits (green rectangles) (© FAO/Éric Lacroix).

2.2. Establishment Activities and Costs

The establishment of cross-wadi walls follows a sequence of coordinated operations designed to ensure structural stability and efficient water harvesting. Activities are scheduled mainly during the dry season to allow mechanical access and stone handling, while tree planting and initial watering are carried out during the following rainy season.

The main steps include site identification and staking, excavation and foundation preparation, wall construction using local stones, compaction and finishing, and finally plantation and watering of *Vachellia* (Acacia) seedlings.

Average establishment cost per structure is summarised below:

- Site identification, staking, and layout survey: 1 day for technician and 2 labourers at 50 USD/day → 150 USD.
- Excavation and foundation preparation: Excavator (2 hours × 93 USD/hour) + 2 truck hours (93 USD/hour) + 3 labourers (50 USD/day) → ≈ 522 USD.
- Stone placement and wall construction: Masonry work (10 m^3 × 90 USD/m^3) → 900 USD; includes loading, shaping, and dry-stone fitting.
- Wing extension and spillway shaping: 3 worker days (50 USD/day) + stone transport (2 truck hours × 93 USD/hour) → 336 USD.
- Finishing and compaction: Manual earth sealing and top-layer dressing (2 workers × 1 day × 50 USD) → 100 USD.

- Planting of trees and shrubs: 120 seedlings × 4 USD → 480 USD, including 3 worker days for planting (150 USD).
- Initial watering and maintenance: Water truck (5 000 L × 18 rounds × 47 USD) → 846 USD; 2 worker days per round for coordination (1 800 USD total over 3 years).

These figures indicate a typical establishment cost of about 4,984 USD per structure and plantation with watering, depending on wall length (5–200 m), stone availability, soil depth, and access conditions. Most of the expenses are shared between local donors (for machinery and transport) and land users (for labour and planting).

Regular monitoring is recommended after each heavy rain to verify wall horizontality and sediment deposition before starting the next planting season.

2.3. Maintenance Activities and Costs

Maintenance activities are essential to ensure the long-term functionality of cross-wadi walls and the survival of planted trees. The first inspections are carried out immediately after the first rainfall and again following each major runoff event to detect early signs of erosion, sediment blockage, or wall displacement. Subsequent maintenance focuses on repairing any damaged sections, consolidating weak points, and ensuring proper water flow through the spillway.

The maintenance phase also includes regular watering of planted *Vachellia* (Acacia) seedlings during the first three years, replacement of dead plants, and light weeding around the plantation area to prevent competition for moisture. Sediment accumulated upstream of the wall is monitored annually and redistributed when excessive buildup reduces the retention capacity.

Typical maintenance costs per structure are estimated as follows:

- Annual inspection and minor repair after first rain: 2 technicians × 1 day × 50 USD/day → 100 USD.
- Maintenance after flood events (two per year on average): 3 workers × 2 days × 50 USD/day → 300 USD.
- Replacement planting (20 seedlings × 4 USD) → 80 USD, including 1 worker day (50 USD).
- Watering of seedlings during dry months: Water truck (5 000 L × 6 trips/year × 47 USD) → 282 USD/year over three years (846 USD total).
- Stone refilling and sealing with earth where gaps appear: 2 workers × 2 days × 50 USD/day → 200 USD.

The average annual maintenance cost is therefore around 1,526 USD per structure, decreasing after the third year once vegetation becomes established. Routine monitoring and timely interventions help extend the lifespan of the walls, promote tree survival, and maintain the water infiltration and sediment-trapping functions of the system.

3. Impacts

The implementation of cross-wadi walls in the Kingdom of Saudi Arabia's national parks has generated significant socio-economic, ecological, and climatic benefits within a relatively short period. The structures slow down surface runoff, trap sediments, recharge groundwater, and allow vegetation to recover naturally along wadi channels. Together with tree planting, they help stabilise soils, restore biodiversity, and foster community engagement in land restoration.

3.1. Socio-economic and Cultural Impacts

The rehabilitation of degraded wadis through cross-wadi walls has visibly improved the surrounding landscape and provided new livelihood opportunities. The construction and maintenance phases create seasonal employment for local workers, while tree planting and watering activities are often supported by community volunteers. The presence of *Vachellia* (Acacia) and *Ziziphus* species encourages beekeeping, which generates supplementary income and strengthens local awareness of ecosystem restoration. The improved scenery, with greener wadis and increased shade, attracts families and visitors, enhancing the park's recreational and educational value and promoting ecotourism.

3.2. Ecological Impacts

Cross-wadi walls have proven highly effective in reducing soil erosion, retaining sediments, and improving water infiltration. The accumulated soil upstream of the structures provides a fertile substrate for the growth of native vegetation, leading to greater tree and shrub density. The resulting increase in vegetation cover enhances soil moisture, reduces evaporation, and supports the regeneration of wildlife habitats. Foxes, birds, and pollinators are commonly observed returning to restored wadis. The system also mitigates drought and flood impacts by regulating runoff and extending soil water availability beyond the rainy season.

3.3. Off-site Impacts

The benefits of cross-wadi walls extend beyond the immediate construction sites. By reducing downstream flooding and sediment transport, they help maintain cleaner drainage channels and protect agricultural and residential areas located further downstream. Enhanced groundwater recharge supports nearby wells and contributes to more stable water availability for local communities.

3.4. Cost-Benefit and Climate Response

Although initial construction requires substantial investment in stonework, machinery, and water transport, the long-term benefits are overwhelmingly positive. Once established, the structures are durable, require minimal maintenance, and continue to accumulate soil and water for many years. The resulting vegetation growth and improved soil fertility create lasting ecological and economic value.

From an economic standpoint, the system provides jobs, supports apiculture, and enhances the park's attractiveness for ecotourism. From an environmental perspective, it contributes to erosion control, carbon sequestration, and biodiversity restoration. The improved vegetation cover reduces dust, stabilises the local microclimate, and increases resilience to temperature extremes, irregular rainfall, and flash floods.

Cross-wadi walls therefore represent a cost-effective and climate-resilient technology that integrates ecological restoration, sustainable livelihoods, and national objectives under Saudi Arabia's Vision 2030 for land degradation neutrality and climate adaptation.

4. Adoption and Lessons Learnt

The cross-wadi wall technology has progressed from a pilot initiative to a standard practice for restoring degraded wadis in Saudi Arabia's protected areas. Its visible ecological impact and the rapid regreening observed after the first rainy seasons have encouraged replication across multiple national parks managed by the NCVC. The approach is now integrated into the FAO-supported SRAD Programme as a key measure for sustainable land and water management in arid regions.

4.1. Adoption and Replication

Adoption has expanded steadily among NCVC-managed parks and nearby communities, supported by technical guidance from FAO and national institutions. Several landowners and local groups have begun constructing small-scale cross-wadi structures using available stones and voluntary labour. Although initial construction costs and machinery access remain challenges, the long-term ecological and social benefits have justified continued investment. Replication is ongoing across the Riyadh, and other regions, where new walls are established every year under local restoration programmes.

4.2. Strengths

Land users and park managers regard the technology as one of the most effective and durable interventions for controlling erosion, improving water retention, and restoring natural vegetation. The structures create fertile terraces and green corridors that support wildlife, increase biodiversity, and enhance the visual and recreational value of the landscape. Technically, the design is simple, adaptable to various wadi shapes, and easily replicable with mechanical or manual construction methods. The system also promotes community participation through labour-based implementation and tree planting activities.

4.3. Weaknesses and Risks

The main limitations concern the high cost of stonework, machinery, and water transport, particularly in remote desert sites. The work requires skilled operators and regular inspection during the first rainy seasons to prevent breaches. Overwatering, poor alignment, or insufficient foundation depth can reduce wall stability. Access to fuel and spare parts for machinery may also delay implementation. However, these risks are manageable through proper design, supervision, and local capacity building.

4.4. Key Lessons

Field experience confirms that successful implementation depends on accurate site selection, careful levelling to ensure wall horizontality, and phased maintenance after floods. Integrating biological components—such as *Vachellia* (Acacia) planting and apiculture—enhances ecological recovery and provides added value to local communities. Continuous monitoring, adaptive management, and the involvement of volunteers and local institutions strengthen long-term sustainability.

Cross-wadi walls are now recognised as a cost-effective and replicable solution for reducing land degradation, restoring vegetation cover, and improving water management in Saudi Arabia's arid and hyper-arid zones. They stand as a flagship example of how structural and vegetative measures can combine to achieve national goals for desertification control and climate resilience under Vision 2030.

5. References and Acknowledgements

All reference links verified on 21 September 2025.

Key References

1. FAO (2024). *State of Land Degradation, Desertification and Sand Encroachment in* the Kingdom of *Saudi Arabia.* FAO internal report, Project UTF/SAU/051/SAU, Riyadh.
2. FAO (2022). *Forest Sector Review of the Kingdom of Saudi Arabia.* FAO internal report, Project UTF/SAU/051/SAU, Riyadh.
3. FAO (2022). *National Park Sector Review of the Kingdom of Saudi Arabia.* FAO internal report, Project UTF/SAU/051/SAU, Riyadh.
4. FAO (2022). *Rangeland Sector Review of the Kingdom of Saudi Arabia.* FAO internal report, Project UTF/SAU/051/SAU, Riyadh.

Additional Sources

National Centre for Vegetation Cover Development and Combating Desertification (NCVC): https://ncvc.gov.sa

Royal Botanic Gardens, Kew: https://powo.science.kew.org

WOCAT Global Database

Full description available online, soon.

https://wocat.net/en/database/list/?country=sa&type=technology

Video

https://player.vimeo.com/video/1026386802

Authors and Contributors

Compilation and review supported by FAO Saudi Arabia under the Sustainable Rural Agricultural Development (SRAD) Programme (UTF/SAU/051/SAU).

Resource persons:

- Abdullah Al Eissa – Designer of the Tree Planting Pit Technique
- Nabeel Boudi – SLM and National Park Specialist
- Mona Dawelbait – SLM Specialist,
- Njeru Jeremiah Gitonga – NRM Specialist,
- Adalhaleem Hassaballa — SLM Specialist,
- Steve Kamerino — SLM and National Park Specialist
- Mosaed Majrashi – SLM Specialist
- Éric Lacroix – SLM and National Park Specialist, compiler of this document
- AbdelHamied Hamid – Reviewer
- Rima Mekdaschi – Reviewer
- William Crtichley – Reviewer
- Yahya Alotibi — Translation reviewer

Acknowledgements

Documentation facilitated by FAO Saudi Arabia in collaboration with the NCVC. Special thanks to Abdullah Al Eissa, the field teams, local volunteers, and communities involved in the restoration of Thadiq National Park.


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