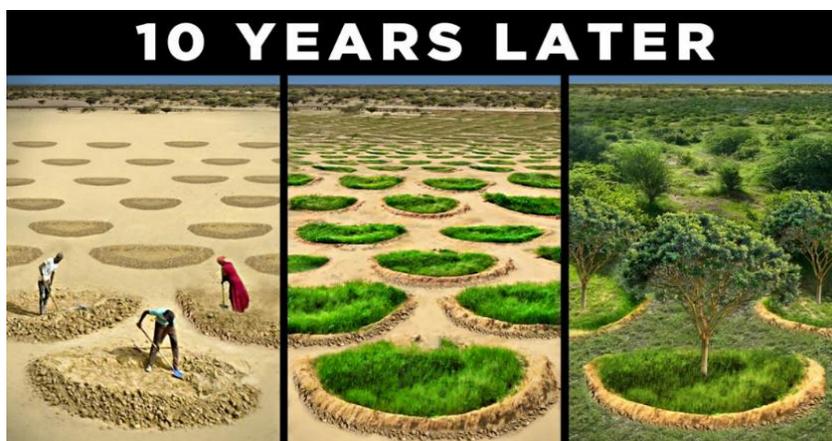


RESCUING THE TRADITIONAL HALF-MOON TECHNOLOGY FOR RAINWATER HARVESTING IN SAHEL REGION

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In the framework of international initiatives aimed at restoring degraded land in Sahel Region, the traditional Half-Moon Technology is being revived for rainwater harvesting, demonstrating its high effectiveness.

The half-moon technique is a traditional Sahel planting method that creates contours to stop rainwater runoff, improving water infiltration and keeping the soil moist for longer. This creates favorable microclimatic conditions allowing seeds and seedlings to flourish.



Half-moon bunds, also known as *demi-lunes*, are simple, semi-circular pits dug into the ground to capture rainwater in arid and degraded landscapes. As the name suggests, each bund is shaped like a half-moon, typically measuring between 2 and 4 meters wide and 25 to 50 centimeters deep. These shallow earthworks are placed with the open side facing upslope, allowing rainwater to collect and slowly infiltrate the soil rather than running off the surface.

Originally developed as a traditional land management practice in the Sahel region of Africa, half-moon bunds are now being adopted more widely as a low-tech, cost-effective tool for combating desertification. The method requires minimal tools, often just shovels, hoes, or ox-drawn plows, and can be implemented by local farmers and community groups without heavy machinery.

Once constructed, the bunds begin to trap not only water but also organic matter, creating a more fertile microenvironment. Over time, these pits support the growth of grasses, shrubs, and even trees, gradually reversing land degradation and restoring biodiversity. Many farmers plant millet, sorghum, or native tree species inside the bunds to maximize food production while restoring the ecosystem.

In the Tahoua region of Niger, a large-scale greening project launched in 2018 has led to the creation of over 250,000 bunds, dug by local farmers with the support of NGOs like Tree Aid and funding from the Great Green Wall Initiative. The results have been transformative. Fields that were once barren now support crops like millet and cowpeas, and vegetation cover has increased by over 40% in some areas. Farmers report more reliable harvests, improved soil moisture, and a reduction in seasonal migration, as young people find work and purpose in land restoration efforts.

The Food and Agriculture Organization FAO has been implementing, since 2022, the Delfino Project in the Sahel region as part of FAO's Action Against Desertification Programme, using the half-moon catchments technique in four countries, Burkina Faso, Niger, Nigeria and Senegal, as part of FAO's Great Green Wall Initiative. The Delfino Project creates large half-moon catchments ready for planting seeds and seedlings, boosting rainwater harvesting by a factor of ten and making soil more permeable for planting than the traditional and



labour-intensive method of digging by hand. This creates favourable microclimatic conditions allowing seeds and seedlings to flourish. In Burkina Faso and Niger, the target number of hectares for immediate restoration has already been met and extended thanks to the Delfino plough. In Nigeria and Senegal, efforts are underway to scale up the restoration of degraded land.

The half-moon method is also used in conjunction with other traditional solutions as the Zaï technique adopted in Burkina Faso. The Zaï method, suitable for the arid Sahel region, uses methods similar to those of the half-moons, but alternatively involves digging smaller pits in non-permeable soil to intercept water and gather compost material. These pits are slightly smaller than the half-moons and are therefore less labour-intensive and can be used in smaller growing plots. They are roughly 15-50cm across; 5-15 cm deep; and positioned about 80 cm apart. [This traditional technique was reintroduced in the 1980s by farmer and agronomist Yacouba Sawadogo](#), who pioneered the method of filling the holes with manure to bolster soil productivity.

[The ICRIAT Institute presents on its website the main solutions offered by the Half Moon Technology.](#) The Demi-lune (Half-moon) technology is a simple and effective rainwater harvesting method used in dry regions to improve crop growth and restore degraded land. It involves digging semi-circular pits (like a half-moon shape) that catch and hold rainwater. The open side of the pit faces uphill, so when it rains, water runs into the pit and is trapped there. Farmers place stones around the curve to keep the shape strong and prevent it from washing away. About 35 kg of compost or organic fertilizer is added inside to enrich the soil. The water and nutrients collected in the pit help crops grow well even in harsh, dry conditions. This technique reduces soil erosion, improves soil fertility, and boosts crop yields, making unproductive land useful again.

The Half Moon technology offers the following solutions:

- **Improved water harvesting and retention.** By capturing and storing rainwater in semi-circular pits, the technology maximizes water availability for crops even in dry spells. This helps mitigate the effects of water scarcity and irregular rainfall.
- **Soil restoration and erosion control.** The pits slow down water runoff and trap sediments, preventing further soil erosion. Over time, the technique restores soil structure and fertility, rehabilitating degraded lands.
- **Enhanced agricultural productivity.** By concentrating water and nutrients around plant roots, the half-moons create favourable conditions for crops to thrive. This leads to higher yields and more resilient farming systems.
- **Low-cost alternative to irrigation.** Half-moons provide a simple, affordable method of rainwater harvesting that does not require expensive infrastructure. They are accessible to smallholder farmers and can be implemented using local materials and labor.
- **Enrichment of soil nutrients.** Adding organic fertilizers or compost to the pits boosts soil fertility naturally. As a result, farmers reduce their reliance on chemical fertilizers, improving soil health and reducing costs.
- **Support for biodiversity.** By restoring vegetation cover, half-moons create habitats that attract insects, wildlife, and beneficial microorganisms. This promotes greater biodiversity and ecosystem resilience.
- **Strengthened livelihoods and food security.** The technology improves the reliability of agricultural production, providing farmers with more consistent food and income sources. This strengthens local livelihoods and reduces vulnerability to climate shocks.



- *Sustainable farming practices.* The method encourages the use of natural materials and traditional knowledge, promoting sustainable and environmentally friendly agricultural practices.

To know more

[Half Moon Technology in ICRISAT website](#)

[The Half Moon Miracle in the Sahel in Youtube.com](#)

[Half Moon Technology in ecotechnews.world](#)

[Half Moon Technology in FAO article about Delfino Project](#)

[Bringing degraded African land back to life. FAO Article](#)

[FAO Article about the Great Green Wall Initiative](#)

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[Africa Food Forest Project in FAO Agroecology database website](#)

[Half Moon in africanfarming.net](#)

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[Half Moon in global.chinadaily.com.cn](#)

[Half Moon Planting in permaculture.co.uk](#)

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[Half Moon Farming in grandemurailleverte.org](#)

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[Half Moon in UNEP Great green wall Article](#)

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[Great Green Wall at COP30 to restore Sahel landscapes in FAO website](#)

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