

Drip Irrigation: Drip Irrigation System

Drip Irrigation

Drip irrigation delivers water slowly and directly to plant roots using drippers placed according to plant spacing. This precise, continuous watering keeps roots moist, minimizes water loss, and can achieve up to 95% water use efficiency, making it the most efficient irrigation method.



International Water Management Institute
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Commodities

Vegetable crop, Bananas & plantains,
Pepper, Tomato

Sustainable Development Goals



Categories

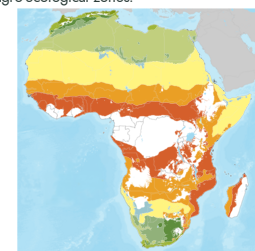
Production, Practices, Water management

Tested/adopted in



Where it can be used

This technology can be used in the colored agro-ecological zones.



Target groups

Farmers, Advisory and Extension Services

! This technology is **not yet validated**.



Scaling readiness: idea maturity 5/9; level of use unknown

Inclusion assessment



Climate impact



Problem

- Traditional irrigation wastes large amounts of water through runoff and deep infiltration.
- Open channels and broad-surface watering cause water loss during distribution.
- Surface watering exposes soil to high evaporation, increasing water demand.
- Aggressive water application in traditional methods leads to soil erosion.
- Emitters and drip hoses often clog due to debris, minerals, or algae.
- Leaks and damages in the irrigation system cause water waste.
- Overwatering or underwatering can harm crop growth and yield.

Solution

- Applies water slowly and directly to root zones, reducing water use by 30-70%.
- Uses closed tubing and precise drippers to minimize conveyance losses.
- Limits soil surface wetting, decreasing evaporation losses.
- Delivers water gently, preventing soil erosion and maintaining soil health.
- Incorporates filtration and regular maintenance to avoid emitter clogging.
- Implements leak detection and prompt repair systems to prevent waste.
- Employs smart irrigation controllers to optimize water supply and avoid over/underwatering.
- Supports fertigation for precise nutrient delivery, improving crop health and efficiency.

Key points to design your project

- Define project goals aligned with national priorities (water conservation, food security, climate resilience).
- Engage local farmers and communities for ownership and sustained use.
- Secure funding via government schemes, grants, and cooperative models.
- Assess technical capacity and provide training on design, installation, and maintenance.
- Conduct site analysis: soil, crop water needs, water source quality, topography.
- Design system layout matching crop spacing and water requirements.
- Select appropriate components: pipes, emitters, valves, filters, pressure regulators.
- Follow best installation practices: setting up water source, piping, emitter placement, testing.
- Implement monitoring for water use, crop performance, and maintenance.
- Evaluate project impact regularly and adapt based on data and feedback.

50 – 300 USD

Drip kit covering an area of approximately 100-500 m²

8,000 - 10,000

USD/Ha

Cost range of commercial drip irrigation systems.

500 - 700
USD/Ha

Estimated energy cost for commercial drip irrigation systems.

1,000 - 5,000 L

Volume range of PVC storage tanks.

0.2 - 0.3
Bar

Pressure generated by storage tanks at 1-2m height.



Open source / open access



Drip Irrigation

<https://taat.africa/swc>

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