Tubewell: Shallow Groundwater Tubewell

Tubewell

The Shallow Groundwater Tubewell is a simple and economical technology for exploiting shallow groundwater (< 20 m) in floodplains with sedimentary soils. A PVC pipe (50 or 63 mm) is installed and the water is pumped using a small 5 to 8 hp pump, powered by fuel or solar energy. Drilling, carried out using a manual auger or jetting, allows for flow rates of 0.5 to 5 m³/h, ensuring reliable irrigation for small farms at low cost.

This technology is pre-validated.

9·9 Scaling readiness: idea maturity 9/9; level of use 9/9

Inclusion assessment 4

Climate impact 7

Problem

- **Limited depth and geology**: Tubewells can only be used when water is shallow (< 20 m) and in non-rocky soils.
- **Costs and maintenance**: Pumping requires energy and regular maintenance, increasing costs for smallholders.
- **Access and reliability**: Despite moderate costs, the initial investment and seasonal variability of water can limit irrigation.

Solution

- **Reliable access to water**: Uses shallow groundwater (< 20 m) for irrigation.
- **Affordable installation**: Manual drilling or jetting, simple and inexpensive.
- **Direct pumping**: Reduces infrastructure requirements and optimizes water for crops.
- **Low energy and solar power**: Small pumps (5–8 hp) and solar power compatibility.
- **Easy maintenance**: Simple equipment available locally.

Key points to design your project

Shallow Groundwater Tubewell: Supporting Sustainable Irrigation

Tubewells provide simple and economical access to shallow groundwater (< 20 m) in floodplains, enabling reliable and smallholder-friendly irrigation while enhancing agricultural resilience and sustainable water management.

- **Costs and area:** Each well irrigates 0.5 to 1 ha for USD 200–300, including maintenance.
- **Supply:** Pumps, pipes, and tools should be sourced locally; plan for transport and installation.
- **Training and support**: Train farmers and technicians on site, drilling, installation, and pumping.
- **Communication:** Guides, videos, and demonstrations to promote economical irrigation and solar options.
- **Installation and practices:** Suitable site, correct drilling, casing, and gravel for stability; combine with water-saving irrigation techniques and crop rotation.
- **Partnerships**: Collaborate with authorities, NGOs, and suppliers for extension, technical support, and maintenance.

This approach enables farmers to irrigate sustainably, optimize production, and promote responsible water management.

900 USD	2587 USD	1687 USD	187 %
Cost per hectare	Revenue per hectare	Net income per hectare	ROI per hectare

IP

Open source / open access

International Water Management Institute
Adebayo Oke

Commodities

Rice, Tomato, Leafy vegetables, Onions

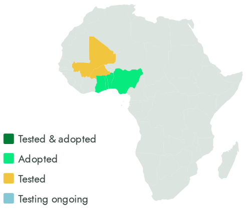
Sustainable Development Goals

2 ZERO HUNGER

Categories

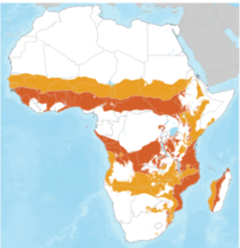
Production, Practices, Water management

Tested/adopted in



Where it can be used

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



Target groups

Farmers