

Technology Fact Sheet: Drip Irrigation

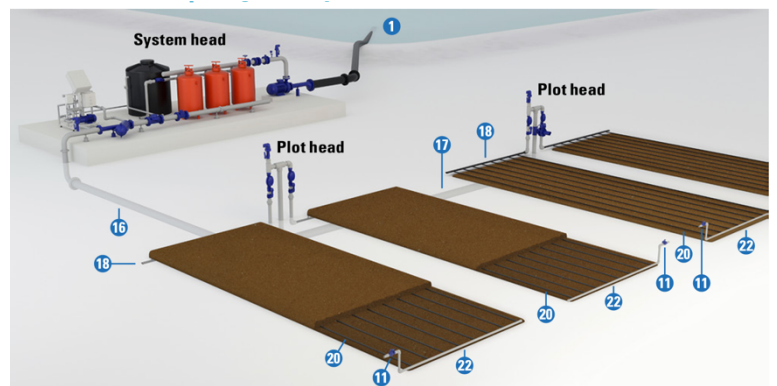
Introduction

In the evolving landscapes of agriculture, the quest for efficiency and sustainability has led to the advancement of innovative irrigation techniques. Drip irrigation redefines the way water is conveyed directly to the roots in a controlled and measured manner. Drip irrigation channels water through a network of tubes and pipes to deliver droplets directly to the soil at the base of each plant. This precision not only conserves water but also optimizes resource utilization, making it an environmentally friendly and economically viable solution for farmers in Mozambique.

Technology characteristics

Drip irrigation involves placing tube emitters on the ground alongside the plants. The emitters slowly drip water into the soil at the root zone. Because moisture levels are kept at an optimal range, plant productivity and quality improve, and it's considered a highly efficient technology. Its main components include the mainline, valve, sub-main, backflow preventer, pressure regulator, filter, tubing adapters, fittings, drip tubing, emitters, and end caps. The system can be set to run automatically or controlled manually.

Potential co-benefits of drip irrigation



- 1 Water source
- 2 Pumping station
- 3 Air valve
- 4 Pressure gauge
- 5 Check valve
- 6 Shock absorber
- 7 Manual valve
- 8 Main filtration unit
- 9 Main filtration automatic drainage valve
- 10 Water meter
- 11 Hydraulic valve
- 12 Secondary filtration unit
- 13 Dosing unit
- 14 Fertilizer tank
- 15 Irrigation controller
- 16 Main line
- 17 Sub main line
- 18 Distribution line
- 19 Kinetic valve (vacuum breaker)
- 20 Dripperline
- 21 Flushing valve
- 22 Flushing manifold
- 23 Fertilizer filter

Figure 1. Structure of a typical drip irrigation system (Drip Irrigation handbook, Netafim, 2015).

Environmental	Drip irrigation, when coupled with solar pumping systems provides distinctive environmental co-benefits. The precise and efficient water delivery of drip systems minimizes water wastage. This approach supports sustainable water management, especially in regions prone to climate change. By optimizing water usage, drip irrigation also contributes to the preservation of soil quality and biodiversity.
Social	Drip irrigation enables smallholder farmers to cultivate crops more efficiently, leading to increased yields and income. The reduced labor and water requirements makes farming more accessible, particularly for women and youth. As communities adopt drip irrigation, local knowledge and skills in precision agriculture and water management practices are enhanced, thus fostering a culture of innovation and sustainability.
Economic	The efficient water distribution of drip systems maximizes the economic returns per drop, contributing to the higher crop yields and improved income for farmers. The upfront investment in drip technology pays off in the long run through increased productivity and reduced operational costs. Moreover, the economic viability of drip irrigation systems attracts private investment, stimulating entrepreneurship and creating employment opportunities in the agricultural value chain.

Through consultations in the local market in Maputo, two different brands have been identified with good quality that are part of the portfolio of agricultural suppliers in Mozambique. These are Netafim and Irritec. The technical specifications are presented below.

Technical Specifications

Technical Characteristics	Netafim (streamline)	Irritec
Nominal Diameter (mm)	18	16
Nominal pressure (bar):	1	1
Thickness (mm)	8	8
Flow per emissor (l/h)	1.1	1.5
Spacing between emissors (m)	0.3-1	0.3
Length of the roll (m)	3000	2800

Applicability and potential to Pangalata Association

The farmers at the Pangalata association are already familiar with using drip irrigation systems, expressing their interest in continuing to work with drip. They refer to sprinkler irrigation as time-consuming and ineffective.

The drip lines of the current system are 80-82 meters long. For the operation, they open 50 meters of drip lines simultaneously (33 lines); the delivery pipe connected to the drip line has a 50 mm diameter. The distance between emissors is 30 cm. The spacing between lines is 1.5 meters, which they chose because potato growing requires a lot of space. As the farmers are already familiar with this technology, the potential to adopt the technology is considered medium-high.



Figure 2. Pangalata fields with existing drip irrigation.

Sources:

- Netafim, 2015. Drip irrigation handbook. Understanding the basics

This project has been proposed by:



And commissioned by:

