



Drip Irrigation: A Need for Southern Haryana

(*Sahil Boora¹ and Rohit²)

¹PG Student, Department of Sociology, CCS HAU, Hisar-125004

²Research Scholar, Department of Extension Education, CCS HAU, Hisar-125004

*Corresponding Author's email: sahil.ghirai1@gmail.com

This article is mainly focus on the major aspects of Drip system as we know water for irrigation facility is very limited and there are some areas in the countries where there is lack of drinking water also i.e., Southern zone of Haryana. Drip irrigation can be a method of irrigation for those areas, it will help in saving water resources and for farmers it will decrease their input cost and that will be beneficial for both farmers and society.

Key Words: Irrigation, Water-saving, Drip, Farmers, Agriculture

In India, water use is increasing and its demand for agriculture, industrial purpose, and personal usage is expected to rise more in the future decades. The problem of shortage of water is becoming more and more worse today. Water use efficiency is important for the survival of an increasing population as well as the country's vertical development. Drip irrigation is an effective way to deliver water directly to the rootzone of the soil. The importance of drip irrigation can be understood by the fact that it reduces wastage of water and is considered a possible alternative for crops that require a lot of water. Drip irrigation is a type of micro-irrigation system in which water is supplied slowly in the form of drop by drop to the root zone of the crops. Drip irrigation method was first invented or used in Israel, which is being used today in many countries of the world. In this method, water is used in a cost-effective manner, which minimizes the loss of water due to surface evaporation and land seepage. Drip irrigation is sometimes called trickle irrigation and involves water dripping onto soil at very low rates (2–20 l/h) from a system of small diameter plastic pipes attached to outlets called emitters or drippers. The drip irrigation system is particularly well suited for alkaline and saline soils, with a water consumption efficiency of 80 to 90 per cent. (Verma and Sharma, 2017). In India, the area under drip irrigation has increased dramatically during the previous 15 years. Rajasthan (1.68mh), Maharashtra (1.27mh), Andhra Pradesh (1.16mh), Gujarat(0.83mh), and Haryana(0.57mh) are the states that use micro irrigation the most (Kumari *et al.*, 2022).

In the southern zone of Haryana state, there is a lack of drinking water facilities and also for irrigation. This area comes under the dry zone and due to unavailability of river water the ground water in this area is continuously decreasing and, in an attempt, to conserve vanishing groundwater resources, the state government of Haryana devised the Ground water Management and Regulation Authority in 2008, with diverse advisory and regulatory functions. A notable outcome of this authority is formulation of the Haryana State Groundwater Management and Regulation Bill in 2008 and recently in a step towards water conservation in Haryana, Chief Minister Manohar Lal Kattar launched a state level flagship programme on drip irrigation method for water needs in fields. Under this yojana 1,445 villages have been identified with ground water table below 100 feet depth. Water conservation schemes had been initiated in 1,669 villages in 36 blocks under Atal Bhujal

Yojna. Satbir Singh Kadian, CEO, Haryana Water Resources Authority said, "Saving water in 1 acre of paddy by shifting to drip irrigation leads to one month supply of drinking water facility to a family of 10 individuals for a month. This will not only attain sustainability goals but also provide sufficient drinking water." (Anonymous, 2022).

Why the world needs drip irrigation

By 2050, there will be 10 billion people on our planet, and there will be 20% less arable land per person to grow enough calories. Due to water scarcity we need to increase agricultural productivity and resource efficiency. This is where drip irrigation fits in, allowing farmers to produce more calories per hectare and cubic meter of water. Apart from this, it has the following advantages and uses-



- Reducing the impact of drought and climate change on food production
- Avoid contamination of ground water and rivers due to fertilizer leaching
- Support rural communities, reduce poverty, reduce migration to cities

So, looking at the importance and need of Drip irrigation in the coming days, this article covers the major aspects of the Drip irrigation.

Uses of Drip Irrigation

- Used in farm fields and gardens.
- Widely adopted in areas with severe water scarcity, and especially for crops and trees such as coconut, containerized landscape trees, grapes, bananas, plums, eggplants, citrus, strawberries, sugarcane, cotton, maize and tomatoes.
- Drip irrigation kits are popular for home gardens and include a timer, hose and emitter. 4 mm (0.16 in) diameter hoses are used for irrigating flowers.

Components of Drip Irrigation

- Pump or pressurized water source.
- Water filter(s) or filtration systems.
- Backwash controller (Backflow prevention device).
- Pressure Control Valve (pressure regulator).
- Distribution lines (main larger diameter pipe, maybe secondary smaller, pipe fittings).
- Hand-operated, electronic, or hydraulic control valves and safety valves.
- Smaller diameter polyethylene tube (often called "laterals").
- Poly fittings and accessories (to make connections).
- Emitting devices at plants (emitter or dripper, micro spray head, inline dripper or inline drip tube).

Advantages of Drip System

1. **Water Effectivity:** Drip Irrigation is the most efficient method of watering today.
 - Places a precise amount of water where you need it
 - Prevents overwatering
 - Results in less weeding
 - Conserves water
 - Saves money
2. **Time-Saving:** Installing a drip system will not only save you water, but time.
 - Eliminate hours of hand-watering
 - Can be fully automated with a timer

- Reduces or eliminates weeding
- 3. **Money-Saving:** Drip systems inherently water directly to the roots of the plants.
 - Drip irrigation uses 30 to 50% less water
 - In one to two seasons, you can make back the cost of purchasing the system
 - Your utility (water) bill will be lower with less water loss to evaporation
 - Drip irrigation components will last many years with proper planning
- 4. **Versatility:** Drip irrigation systems can be used just about anywhere.
 - Gardens, vineyards, greenhouses and row crops
 - Existing or new landscapes
 - Hillsides or flat terrain
 - Long-lasting and adaptable
 - Fertilizer can be fed to the plants while the system is running with a fertilizer injector
- 5. **Plant Health:** Drip irrigation puts water at the base of the plants rather on the leaves
 - Helps prevent mildew on leaves
 - Minimizes diseases that can grow and spread on wet leaves
 - Reduces evaporation of water droplets in the air

The disadvantages of drip irrigation are:

- Equipment cannot be properly maintained if the water is not filtered properly.
- Initial cost may exceed system overhead.
- Sunlight can affect the tubes used for drip irrigation, shortening their lifespan.
- Drip irrigation may be unsatisfactory if herbicides or top-dressing fertilizers require sprinkler irrigation for activation.
- Drip tape after harvest, incurs additional cleaning costs. Users need to plan for drip tape winding, disposal, recycling or reuse.
- These systems require careful study of all relevant factors such as land topography, soil, water, crop and agro-climatic conditions, and suitability of the drip irrigation system and its components.
- Subsurface drip in light soils may be unable to moisten the soil surface for germination. The installation depth requires careful consideration.
- Drip irrigation system cannot be used to control night frost damage (as in the case of sprinkler irrigation system)

Precautions to avoid system damage

- By being aware of drip irrigation limitations you can preserve your system for many years. Do not use power tools, such as edgers and lawnmowers, around your drip tubing.
- Continuously covering the tubing with mulch also prolongs its lifespan. Sunlight shortens its lifespan by about five years. However, covered tubing can last up to 20 years.

How effective is drip irrigation?

Drip irrigation is known to be the most efficient irrigation methods with 95-100% water use efficiency. This is compared to sprinklers, or flood and furrow systems, with water use efficiencies of 80–85% or 60–70%. Efficiency is related to the effectiveness of the system on crop performance and ultimately the yield and profitability of the farmer.

Governmental Measures to Micro-Irrigation

Haryana government had introduced Water Tank Scheme for micro-irrigation and the subsidy amount to be given by the Haryana state govt. to individual / group of farmers are

Individual Farmers

- Construction of Water Tank - 70% Subsidy
- Solar Pump - 75% Subsidy
- Mini Sprinkler / Drill - 85% Subsidy

Group of Farmers

- Construction of Water Tank - 85% Subsidy
- Solar Pump - 75% Subsidy
- Mini Sprinkler / Drill - 85% Subsidy

Subsidy on Completion of Work

The Haryana govt will provide 20% subsidy on completion of water tank excavation, 40% on completion of water tank construction and 40% on the installation of micro irrigation system in the beneficiary area (Sneha, 2022).

Conclusion

Drip Irrigation System is a proven technology suitable for use with high-value crops. Several crops which can be irrigated using drip irrigation systems include sugarcane, groundnuts or peanuts, coconuts, cotton, coffee, grapes, potatoes, and all fruit crops, spaced vegetable crops, and flowers. By this process, we can save ample amount of water, which can be used time of drought. This process does play important role in the society by saving the ample amount of water and through this farmer of southern Haryana can decrease their input cost by not using groundwater through generator.

References

1. Anonymous (2022). Haryana CM launches state-level drip irrigation programme. <https://indianexpress.com/article/cities/panchkula/haryana-cm-launches-state-level-drip-irrigation-programme-7997380/>
2. <http://hortharyana.gov.in/en/plan-scheme-on-national-mission-on-micro-irrigation-sharing-basis-part-ii-for-the-year-2018-19>
3. Kumari, V., Chander, S. and Sharma, S. (2022). Knowledge and Adoption of Drip Irrigation in Citrus Crops among Farmers of Western Haryana. *Indian Journal of Extension Education*, **58**(1): 151-156.
4. Mishra, A., Jain, S.M. and Kundu, K. (2018). Impacts of Drip irrigation in India. *International Journal of Advance Research, Ideas and Innovations in Technology*, **4**(4): 606-608.
5. Sneha (2022). Haryana Water Tank Subsidy Scheme 2022 for Farmers using Micro Irrigation. <https://www.yogyojana.co.in/2021/11/water-tank-subsidy-scheme-haryana.html>
6. Verma, H. and Sharma, S. (2017). Factors associated with adoption of drip irrigation system by the farmers in Bikaner district of Rajasthan, *Asian Journal of Agricultural Extension Economics and Sociology*, **18**(1): 1-8.