

## Micro Irrigation in Marathwada Region: An Overview

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### Abstract

The concept of irrigation is as old as the human civilization; however there has been enhanced efficiency in the irrigation patterns over a period. In India, agriculture sector the largest user of water, is constantly facing an acute shortage of surface, as well as underground water. Drip irrigation was introduced in India during early seventies and significant development has taken place in the research on drip irrigation from eighties till date. The technology of drip irrigation is becoming increasingly popular in regions of water scarcity where the available water is non sufficient to irrigate the command area by surface irrigation. The present investigation was carried out to find micro irrigation adoption among the farmers. It was found that total irrigated area was decreased but irrigated area under micro irrigation was increased from 3.46 percent to 5.36 percent in Maharashtra state during 2013-14 to 2015-16. In case of Marathwada region creating rate of drip irrigation in marathwada was decreased.. The drip irrigation is useful for cultivation of land in this region through out the availability of water.

**KEYWORDS :** Micro irrigation, Drip irrigation, Adoption, Marathwada

### Introduction:

The concept of irrigation is as old as the human civilization; however there has been enhanced efficiency in the irrigation patterns over a period. In India, agriculture sector the largest user of water, is constantly facing an acute shortage of surface, as well as underground water. The availability of water in appropriate quality and quantity is under severe stress with the increasing demand of water from various sectors. The overall development of the agriculture sector is always help to increase the GDP. Therefore, it is needful to judicious use of the available water resources in India. While major and medium irrigation projects have contributed to the development of water resources. But, these water resources are inefficient for conventional methods of irrigation and lead to wastage of water.

Micro Irrigation is a newly introduced system in the country and little work has been done on application and evaluation of micro irrigation for some major crops like sugar cane, banana, fruits and vegetables, cotton and cotton-based cropping system in the country. Although there are various ways of irrigating crops, like drip and sprinkler irrigation systems considered as the best in bringing about water and fertilizer use efficiency along with improved crop productivity. Maharashtra is one of the pioneers State in using Micro Irrigation System since 1986-87. Centrally sponsored Micro Irrigation Scheme is being implementing from 2005-06 in our State. National Mission on Micro Irrigation Scheme (NMMI) has been launched from 2010-11 for both Horticultural & Non Horticultural crops.

Drip irrigation more popular in all over the country, due to its efficiency one can use optimum or little quantity of irrigation water for crop production. Several results of research established that about 40 to 60 per cent of available water could be saved by adopting drip irrigation. In India 33 per cent (83 million ha) area in under

irrigation out of total cropped area (237 million ha). In Maharashtra out of 21.1 million hectares cultivated area only 15.4 per cent area (3.3 million ha) is under irrigation). The present paper objective is to study the coverage of the micro irrigation. For the purpose of this study, secondary data is collected from different sources. The secondary data is used for workout the potential of micro irrigation in Marathwada. The secondary data from the authentic sources collected about the coverage of micro irrigation.

### Survey of Literature:

According to the INCID (1994) reports, 80 crops can be cultivated under drip and sprinkler irrigation method. While Drip Irrigation Method is highly suitable for wide spaced horticulture and other crops, closely grown crops are found to be highly suitable for sprinkler irrigation method. It is also indicate that up to 40% to 80% of water can be saved and water use efficiency (WUE) can be enhanced up to 100% in a properly designed and managed Micro Irrigation system compared to 30-40% under conventional practice.

K.S. Bhaskar, M.R.K. Rao, P.N. Mendhe, M.R. Suryavanshi (2005), has been completed his study on 'Micro Irrigation Management in Cotton'. It has been summarized that: Micro irrigation has given very high (> 90 %) irrigation efficiency with significant improvement in yield and quality of cotton, vegetables and horticultural crops. Majority of the area (55.40 %) covered under micro irrigation is in horticultural crops, while 7 % it is under field crops. Yield improvement due to micro irrigation has been reported up to 35-50%, in cotton 5-10%, in castor 15-42%, in groundnut 20-66% and in potato 20-26%. Irrigation through drip system was found superior to flood, alternate furrow irrigation, irrigation in each furrow and sprinkler irrigation with higher water saving and quality produce. The area under micro-irrigation is increasing over the years in the country, mainly due to its utility in water saving and better water use efficiency.

A. Narayanamoorthy (2008) has been completed a study on, 'Drip irrigation and rainfed crop cultivation. This study shows that cultivating cotton under drip method of irrigation provides a number of different benefits to farmers over Flood Irrigation Method. While reducing the cost of irrigation to the tune of about 50 per cent, drip method of irrigation also helps reducing the cost on weeding, interculture as well as preparatory works. Water saving due to the adoption of drip method of irrigation in cotton cultivation is estimated to be about 45 per cent over Flood Irrigation Method. Reduced withdrawal of water under Drip Irrigation Method also helps to reduce the consumption of electricity of the tune of about 140 Kwh/acre over the conventional irrigation method. The productivity difference between drip irrigated cotton (18.25qtl/acre) and flood irrigated cotton (8.50 qtl/acre) comes to about 9.75 qtl/acre, which is about 114 per cent higher than the same harvested using flood method of irrigation.

According to the Programme Evaluation Organisation (PEO) Report 2014, the popularity of Micro Irrigation has been improved remarkably in the states like Rajasthan and Haryana, because of their water scarcity with undulating topography and sandy soils. Rajasthan has recorded the highest area covered under the sprinkler irrigation system and so also Haryana, which has covered a significant proportion of land under this system in Andhra Pradesh is the highest, covering 38 per cent area, followed by Maharashtra (28 percent), Gujarat (13 per cent) and Karnataka (12 per cent) if compared to cumulative of area covered under drip in all sample States.

**Irrigation status in Maharashtra:**

The total live storage as on 15th October 2015 in the major, medium and minor irrigation (State sector) reservoirs taken together was 18,072 million cubic meters, which was nearly 44.4 percent of the storage capacity as per the project design. Live storage of water, irrigation potential and actual irrigated area are given in below Table. The table indicate that the total irrigated area was decreased from 32.46 lakh (ha) to 24.47 lakh (ha) in percentage from 67.60 to 49.80 during 2013-14 to 2015-16 in Maharashtra state.

**Table No 01-Irrigation potential and actual irrigated area in Maharashtra**

<b>Year</b>	<b>Irrigation potential created (as on 30th June) (lakh ha)</b>	<b>Actual irrigated area (1st July to 30th June) (lakh ha)</b>	<b>Percentage of actual irrigated area to irrigation potential created</b>
2013-14	48.03	32.46	67.60
2014-15	48.66	31.37	64.50
2015-16	49.10	24.47	49.80

**Source:** Economic Survey of Maharashtra 2016-17

**Status of Micro Irrigation in Maharashtra:**

Drip irrigation is a type of micro-irrigation. Its potential is to the save water and nutrients by allowing water to drip slowly to the roots of plants, either from above the soil surface or buried below the surface. Drip irrigation systems distribute water through a network of valves, pipes, tubing, and emitters. It is Depending on how well designed, installed, maintained, and operated it is, a drip irrigation system can be more efficient than other types of irrigation systems, such as surface irrigation or sprinkler irrigation.

Simcha Blass was an eminent Israeli engineer and inventor of Drip System. He was the key person in the water development, introducer and developer of new drip irrigation systems in Israel. During early 1930s, a farmer drew his attention to a big tree, growing in his backyard "without water".

Maharashtra government has been providing subsidy since 1986-87 onwards through State schemes Maharashtra State alone accounts for nearly 50% of the India's total drip irrigated area followed by Karnataka, Tamil Nadu and Andhra Pradesh. In Maharashtra due to state govt. schemes and extension facility, outreach of drip Irrigation is highest in India. The other reasons of improving Drip Outreach are, Area under irrigation from both surface and groundwater is quite low and hence, many farmers have adopted drip irrigation to avoid water scarcity largely in divisions like Nashik, Pune, etc Owing to continuous depletion of groundwater, farmers are not able to cultivate wide spaced and more lucrative crops like grapes, banana pomegranate, orange, mango, etc. by using only surface irrigation methods in many regions. The total area covered under Micro Irrigation in Maharashtra is 13.87 lakh ha. out of that 9.99 lakh comes under Drip and 3.88 lakh ha. under sprinkler irrigation system up to March 2013.

**Table No- 02**  
**Year wise Newly Created Drip & Sprinkler Irrigation Area in Maharashtra**

Year	Irrigated area under Micro irrigation Area (ha)		
	Drip irrigation	Sprinkler irrigation	Total Area
2013-14	81800	30296	112096 (3.45)
2014-15	170719	43098	213817 (6.82)
2015-16	102041	33898	135939 (5.56)

**Source:** Economic Survey of Maharashtra 2016-17

Above table indicate that the newly created total micro irrigation area increased from 112096 (ha) (3.45 percent) to 135939 (ha) (5.56 percent) out of them Drip irrigation area increased from 81800 (ha) to 102041 (ha) and sprinkler irrigation area increased from 30296 (ha) to 33898 (ha) during 2013-14 to 2015-16 in Maharashtra state. In short total irrigated area was decreased but irrigated area under micro irrigation was increased in Maharashtra state.

#### **Status of Irrigation in Marathwada:**

The total area covered under Micro Irrigation in Marathwada region under Micro Irrigation is 31173.24 ha. up to March 2013 (NMMI beneficiary list 2012-13). Drip and Sprinkler system of irrigation have many advantages over traditional flow system of irrigation. Since last 3-4 years demand for Micro irrigation is increasing every year. Now every year on an average 2.50 lakh hectare area is coming under Micro Irrigation (Report of the Joint Inspection Team - 2013).

**Table No 03 - Status of Drip Irrigation in Maharashtra**

(Area ha)

Districts	2013-14	2014-15	2015-16
Aurangabad	205.87	194.71	42.14
Beed	64.65	47.64	16.00
Hingoli	12.24	12.93	7.41
Jalna	139.19	43.12	8.64
Latur	75.62	43.07	11.58
Nanded	26.25	28.32	16.36
Osmanabad	82.79	58.11	13.49
Parbhani	122.91	68.82	24.38
<b>Total (Marathwada)</b>	<b>729.52</b>	<b>496.72</b>	<b>140.00</b>

**Source:** <http://mahaethibak.gov.in/ethibak/index.php>

Above table indicate that the newly created total drip irrigation area decreased from 729.52 (ha) to 140 (ha) during 2013-14 to 2015-16 in Marathwada region. In short newly created total drip irrigation area was decreased in Marathwada region.

### **Advantages of Drip Irrigation:**

Following are the some advantages of the drip irrigation.

#### **1. Easy Installation:**

Installation of Drip irrigation is very easy. It does not require excavating and rarely disrupts the integrity of a landscape bed during installation. Tubing is weaved throughout the area requiring watering. Therefore, drip irrigation systems can be moved and are not permanent like conventional irrigation systems (involving spray-heads, pop-up heads, etc.).

#### **2. Conservation of Water:**

When we cultivating the land with drip irrigation, water is delivered directly to the ground's surface rather than being sprayed up and out over an area. This direct application of water is saving the yields of water. In that cause water use efficiency is increasing.

#### **3. Savings in Water and Energy Bill**

Drip irrigation is saving the water. So, more efficient watering in the landscape saves money. As a Kauai commercial property owner, you're looking to reduce monthly expenses and drip irrigation can decrease that water and energy bill.

#### **4. No Drift**

Drip irrigation can deliver 1 to 4 gallons of water per hour to a landscape bed, and there is no drift, which is what happens when wind carries water dispersed from an irrigation system to areas that do not need water. Drift wastes water.

5. Maximum crop yield.

6. High efficiency in the use of fertilizers.

7. Low labour and relatively low operation cost.

8. Improves seed germination.

### **Disadvantages of Drip Irrigation :**

In fact that drip irrigation has so many potential benefits, they're a certain limitation also, there are as follow:

#### **1. Regular Maintenance:**

There are some maintenance considerations you should know about before having a system installed. Primarily, these systems require more regular maintenance than conventional irrigation systems.

#### **2. Regular System Flush-outs**

The drip irrigation system will require system flush-outs on at least a monthly basis, and more depending on the type of water that's flowing through the tubing. Non-potable water contains more particles and can more easily clog filters and drip emitters. And no matter what type of water you're using to water your property, the nozzles on drip emitters must be cleaned out sometimes weekly.

#### **3. Best For Beds:**

There are limited uses or drip irrigation. For instance, drip irrigation is not a solution for a lawn area, which will require conventional irrigation to disperse water throughout an open area. So, chances are that drip irrigation is an option for some areas of your Kauai landscape, but not all portions of the property.

#### **4. Diligent Oversight**

A landscape maintenance crew must keep a careful eye on plant health to ensure that the drip system is working properly. Plants suffer when a drip system is not working effectively or needs to be cleaned. The thing is, you might not notice there is a problem right away because the decline is gradual. That's why it's critical to have

professionals maintaining your property so they can identify and manage any issues with your drip irrigation system before plants take a hit

5. Sensitivity to clogging
6. Moisture distribution problem
7. Salinity hazards
8. High cost compared to furrow.

**Conclusion:**

This paper pointed that, the total irrigated area was decreased but irrigated area under micro irrigation was increased from 3.46 percent to 5.36 percent in Maharashtra state during 2013-14 to 2015-16. In case of Marathwada region creating rate of drip irrigation in marathwada was decreased. When we see the availability of water in Marathwada region the micro irrigation in particular drip irrigation is useful for cultivation of land.

**Bibliography:**

1. INCID (1994), Drip Irrigation in India, Indian National Committee on Irrigation and Drainage, New Delhi.
2. K.S. Bhaskar, M.R.K. Rao, P.N. Mendhe, M.R. Suryavanshi (2005), Micro Irrigation Management In Cotton, Central Institute for Cotton Research Nagpur, CICR Technical Bulletin No: 31, available at [www.cicr.org.in](http://www.cicr.org.in)
3. A. Narayanamoorthy, (2008), Drip Irrigation and Rainfed Crop Cultivation, Indian journal of Agricultural Economics, Vol.63, No. 3 July -Sept.2008.
4. Programme Evaluation Organisation Report – 2014 on Evaluation Study on Integrated Scheme of Micro Irrigation, conducted by, Planning Commission, Government of India, New Delhi.
5. Economic Survey of Maharashtra 2016-17
6. <http://mahaethibak.gov.in/ethibak/index.php>
7. <http://www.krishi.maharashtra.gov.in>
8. <http://agricoop.nic.in/agriculturecontingency/maharashtra>