

## **“Micro Irrigation in India: An Advanced Technology for Agricultural Growth”**

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### **Abstract:**

Water is the basic need for agriculture. Even today, most of the farmers adopt the ancient method, due to which there is more wastage of water in agriculture. To prevent wastage of water, farmers need to be made more and more aware that water can be saved for the future. According to the international water management institute, more than 75% of groundwater has been used for agriculture. And the water scarcity will increase and people will face this situation in the future. Agriculture growth is dependent on best use of available water on the earth. Micro irrigation has received attention to contribute to an important role in ground water resources. The aim of Micro irrigation is to increase the area in an efficient manner as per available water resources. Hence water scarcity can be reduced from the agriculture sector by using Micro irrigation technology. The government of India has introduced many schemes for the farmers in the agriculture sector. The aim of this research is to analyze the benefit of the Micro irrigation system, so that Indian agriculture growth could be increased with advanced technology. This is possible only in the favorable conditions of the Micro irrigation system. Another aim of this research is to point out the future coverage of Micro irrigation systems in India. This policy must be promoted in India where there is water scarcity and dark zones are increasing rapidly.

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### **Keywords:**

Micro irrigation, water scarcity, agriculture growth, water resources, PARDHAN MANTRI KRISHI SINCHAI YOJANA (PMKSY).

**Introduction:**

In India, the water scarcity is increasing in the coming decades due to highly increasing growth in population and to feed the population more pressure will increase on agriculture. Agriculture is the main source of food and it depends upon the availability of water. Water is an important need of farmers who grow crops. The water availability depends upon various factors and by using available water properly the efficiency can be increased. Since water is a precious resource for agriculture, there is a need for efficient proper use of water and Micro irrigation type of technology. Micro irrigation technology is promoted in India by the central government, state government and many NGOs. Micro irrigation plays an important role in water management like water use efficiency, water saving, increase income, reduce poverty, enhance the food security, efficiency of fertilizers, increase in crop yield etc. The aim of the Micro irrigation system is to increase the area under Micro irrigation. The Department of Agriculture, Cooperation & Farmers Welfare (DAC&FW) has been playing a leading role for the promotion of improved irrigation methods. DAC&FW launched a centrally sponsored scheme on Micro irrigation in the year 2005-06 which was subsequently converted as National Mission on Micro irrigation in the year 2010-11. During 2014-15, the scheme was converted as On Farm Water Management component of National Mission for Sustainable Agriculture (NMSA) and further subsumed under Per Drop More Crop Component of PMKSY. In the year 2016, a study on Micro irrigation is considered as a part of Pradhan Mantri Krishi Sinchayee Yojana (PMKSY). According to the study the penetration of Micro irrigation in India is less as compared to other countries. Hence, for achieving higher efficiency of Micro irrigation, it is necessary to know the benefit of Micro irrigation. The total area covered under micro irrigation in India, in the year 2020-21 is 8.67 lakh ha. In which, Drip irrigation covered area is 3.16 lakh ha. & sprinkler irrigation covered area is 5.51 lakh ha.

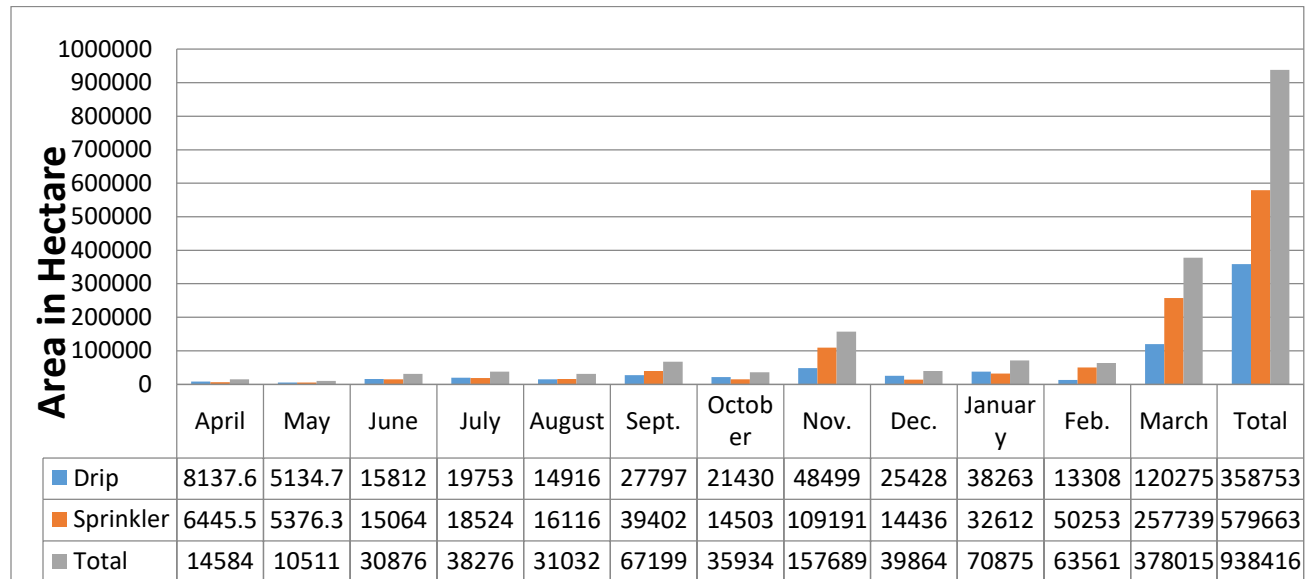
**Types of Micro Irrigation:****Drip Irrigation:**

Drip irrigation system started in the year 1860, in Germany. This technique is known as a highly water saving technique for irrigation. This system allows controlling the use of water and fertilizer through using valves, pipes, tubing etc. Drip irrigation supplies water directly to the root of crops. This technique was firstly experimented in the desert area of NEGAR and AREVA in Israel during the early 1960's. After this, this technique was tested in different countries like Australia, Mexico, New Zealand and South Africa. The results were outstanding. This system uses drip emitters that deliver water at very low rates. By using drip irrigation 45% water has been saved and 25% fertilizers also saved.

**Sprinkler irrigation:**

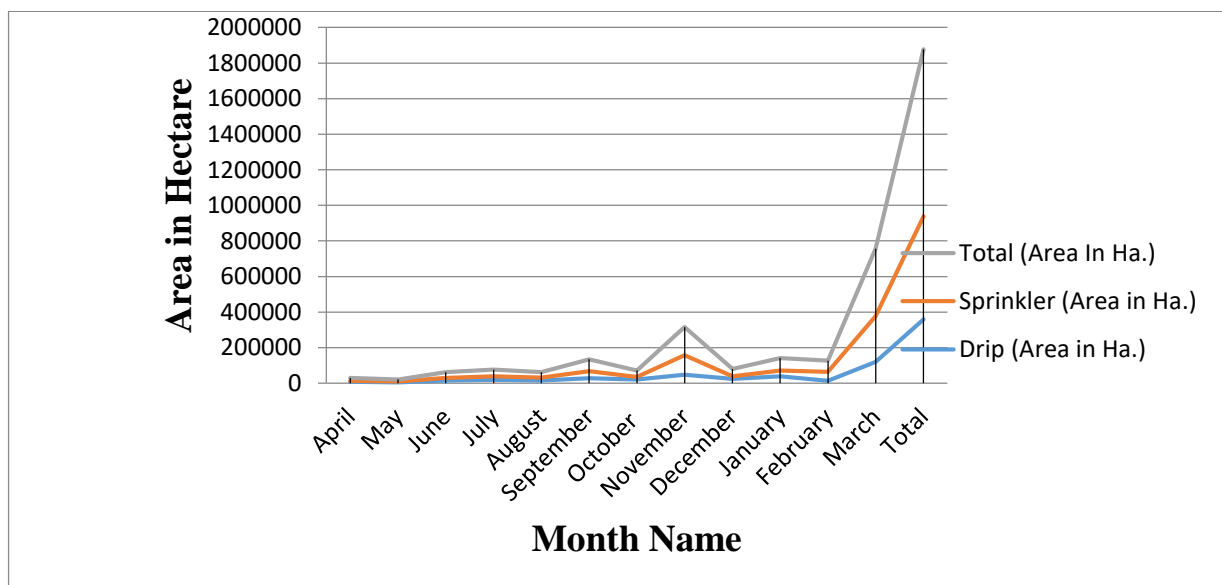
The sprinkler irrigation developed in many countries. In India, sprinkler irrigation is used by many states like Rajasthan, Haryana, Maharashtra and many more states. By this technique, water is carried by using pipes with the pressure of water and 50% water saved more crops and the yield percentage of crops also increased.

**Figure 1: Micro Irrigation Coverage Area 2020-21 ( In Ha.)**



(Source: PMKSY, Ministry of Agriculture and Farmers Welfare, Govt. of India)

**Figure 2: Micro Irrigation Coverage Area 2020-21 ( In Ha.)**



(Source: PMKSY, Ministry of Agriculture and Farmers Welfare, Govt. of India)

Figure 1 & 2 shows the area coverage under Micro irrigation during the year 2020-21. The area covered under Drip irrigation increased from the month of April to June. And it slightly decreased in the month of August. The area of Drip was highly increased in the month of November. It further decreased in the month of February and again highly increased in the month of March. Similarly, the area under Sprinkler increased in the month of June from the month of April. It highly increased in the month of September and decreased in the month of December. In the month of February, the area is increased and rapidly increases in the month of March. The total area under Micro irrigation was increased in the month of June starting from the month of April. The area increased continuously in the month of September and it decreased in the month of December. The total area is slightly increased in the month of February and highly increased in the month of March.

### **Objectives of Research Study:**

This paper specifically aims to increase the area under Micro irrigation and to enhance water use efficiency in India. It will help to promote Micro irrigation in the area where water scarcity is more. This paper aims to promote Micro irrigation for Agriculture and horticulture crops with modern knowledge. It is a short attempt to develop Micro irrigation in water consuming crops like sugarcane, cotton etc and give more focus to the maximum coverage of Micro irrigation technology. One may estimate the water saving due to Micro irrigation, with the help of this research. One may examine the electricity saving due to Micro irrigation. Other benefits of Micro irrigation technology have been discussed in this research attempt.

### **Results:**

Micro irrigation has been widely noticed in India in the last 15 years and the major findings based on the given graph study:-

1. Adoption of Micro irrigation in India is very slow as compared to total irrigated area, due to lack of physical, social and policy environment etc.
2. The rate of adoption of Micro irrigation is still very low even after promotional efforts made by governments and NGOs.
3. Only few States have expanded the irrigated area under Micro irrigation due to higher cost and complexity of technology, cropping pattern etc.
4. Delay in subsidy disbursement for the farmers.
5. Water use efficiency is higher as compared to non Micro irrigation methods.
6. Reduced consumption of electricity by using Micro irrigation technology.
7. Reduction in cost of cultivation and increased productivity of crops.
8. Micro irrigation technology has reduced the cost of fertilizers, man power also

9. A major problem in the adoption of Micro irrigation is it's high installation costs which discourage the farmers of small and medium categories from adopting this technology.
10. Awareness or knowledge does not guarantee unless the technology is made easier to the farmers through the institutional system.
11. Access to groundwater. As expected the ownership of wells increases the adoption of Micro irrigation. As the depth of wells increases, the adoption of Micro irrigation technology also increases.
12. Absence of easy financing mechanisms for farmers.
13. Delay in release of guidelines / government orders, uncertainty and sporadic changes in scheme guidelines.

### **Conclusion & Suggestions:**

As the Government is making regular efforts on promoting Micro irrigation technology through various schemes. So that farmers may adopt this technology in the maximum irrigated area. However, there is a need to promote this scheme through awareness campaigns, media, internet, training, workshops etc. Government should provide subsidies to the heavy installation cost of the Micro irrigation system in an easier manner. The supply of fertilizers, equipment should be provided by the Agencies. It is necessary to provide the quality of emitters of different agencies. After installation of the Micro irrigation system, the technical support should be supplied by the agencies for operating the system. Farmers have a lack of knowledge regarding operation and its maintenance. So it is necessary to provide operational knowledge to the farmer. By providing training facilities, the adoption of Micro irrigation systems can be increased. Hence, the government should promote this water saving technology to the farmers of India by encouraging them on agronomic packages. A special package may be introduced for long facilities for the farmers who are willing to adopt this technology. Arrangement should be made to distribute the subsidy within the limited period of one or two months and there should be provision for at least 3 years free service to the farmers by the agencies.

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