



Q.ID 931106-1

**Preserving water resources for the sustainable growth of India complements the noble vision of doubling farmer incomes by 2022. In this context, discuss how the micro irrigation can increase water use efficiency in India. Identify the major challenges involved in its implementation. (15 Marks, 250 Words)**

**STRUCTURE OF ANSWER**

1. Introduction : start with need of micro irrigation for improving water use efficiency (25-40 words)
2. How the micro irrigation can increase water use efficiency in india ? (60-70 words)
3. Major challenges involved in the implementation of micro-irrigation technology (70-80 words, write any 5-6 points)
4. Way forward – mention the alternatives to micro irrigation (conclude with this in 60-70 words)

**Introduction :**

**Need Of Micro Irrigation For Improving Water Use Efficiency-**

Agriculture is the largest consumer of freshwater in India. Presently, irrigation water use accounts for 80% of the available water, i.e. 700 BCM. Moreover, the present level of irrigation efficiency for surface and ground water is 30% and 55%, respectively. It is desired that the efficiency level of surface and ground water irrigation by 2025 should reach 60% and 75%, respectively.

**How the micro irrigation can increase water use efficiency in India ?**

Sprinkler irrigation and drip irrigation are the commonly used micro-irrigation methods.

Punjab, Haryana, Uttar Pradesh, Bihar, Maharashtra, Telangana and other water-deficient states should promptly move towards micro-irrigation systems. These techniques have significantly higher efficiency vis-à-vis flood irrigation techniques.

The total potential for micro-irrigation in the country is around 69 million hectares. Conventional surface irrigation provides 60-70% efficiency, whereas, higher efficiency of up to 70-80% with sprinkler and 90% with drip irrigation systems can be achieved.

Micro-irrigation technology ensures water use efficiency as much as 50- 90%. This can be achieved due to the fact that micro-irrigation helps to reduce conveyance losses, runoff, evaporation losses, seepage and deep percolation losses significantly.

**Per Drop More Crop” fallacy**

**Whether micro-irrigation saves water or not?**

Policies and programmes are clueless whether the “Drop” referred in the “Per Drop More Crop” is the “Drop” diverted (also known as withdrawn) from a water source to farms (or basins) or the drop consumed by the crops i.e. Evapotranspiration (ET). Because a reduction in ET is what constitutes real water savings, if the



“Drop” referred to is assumed to be ET, then “Per Drop More Crop” is fallacious as micro-irrigation does not reduce ET.

One comparison involving the application of water through drip and furrow irrigation on Tomato crops (UC-82) but found no difference in the seasonal ET under similar crop canopies. In fact, the mean ET loss under daily drip irrigation actually exceeded that from furrow irrigation by about 8.9

Hence, the policies and programmes that promote micro-irrigation as a game-changer in India’s water management lack conclusive research to show that micro-irrigation reduces crop consumptive use or ET for any crop

### Major Challenges involved in the implementation of micro-irrigation technology

(70-80 words, write any 5-6 points)

1. There are policy concerns. For example, micro-irrigation schemes have repeatedly changed outfits (or been ‘subsumed’ under multiple schemes) over time – beginning with the Centrally Sponsored Scheme on Use of Plastic in Agriculture (1992) and followed by Accelerated Irrigation Benefit Program (AIBP, 1996); National Horticulture Mission (2005); Centrally Sponsored Scheme on Micro-Irrigation (2006); Rashtriya Krishi Vikas Yojana (2007), National Mission on Micro-Irrigation (NMMI, 2010); National Mission on Sustainable Agriculture (2014) and finally to its present form, Pradhan Manti Krishi Sinchayee Yojana (PMKSY) in 2015.
2. Delays in subsidy disbursement in some states – largely because of approving installation of equipment when the funds for subsidy aren’t yet available, which often causes a shortage of funds, and in turn, delays in subsidy payments and uncertainty for the suppliers of micro-irrigation systems
3. Lack of widespread private financing in micro-irrigation projects (NITI Aayog only began inviting proposals from private sector in 2016)
4. No ‘easy’ financing mechanism for farmers to adopt micro-irrigation, where collateral stays within the farmers’ means.
5. With effective farm-sizes diminishing and farm output/income depreciating, chances of nationwide adoption of micro-irrigation is limited by financial constraints of potential users. Under the PMKSY, there is now a 60:40 cost-sharing agreement between the government and farmers (90:10 in NE states). But is this enough?
6. For poorer farmers (smallholder and/or female-farmers or female-headed households), it is still unviable as government schemes and financial assistance programmes barely (if at all) cover re-procurement of equipment in the event of the sophisticated system becoming obsolete before the stipulated period of next assistance.
7. Lack in support for maintenance (for example, rodent attack on piping, pore-clogging) and operation.
8. ‘Mismatch’ between timing of micro-irrigation supports available to the users, and seasonal cropping patterns.
9. Micro-irrigation schemes are yet not operational year-round (available for only five months on average), which means there are likely risks that farmers may miss peak of the cropping season, be unable to enjoy true benefits and thus, gradually become disinterested.

**Way forward (40-50 words)**



1) Steps for success include

- re-appraisal of farmers' subsidy/credit schemes, especially ones targeted for micro-irrigation;
- capping central subsidies to states doing well while hiking them for those lagging behind;
- encourage private financing;
- increase support staff, both at central and state-level, and
- jack up IT support (a key propelling force for Haryana, AP, Gujarat and Maharashtra to make them national leaders in micro-irrigation), and
- make provisions for year-round operational support.

2) Attempts to subsume micro-irrigation schemes under other agrarian schemes should stop. It is time to realise the need to make micro-irrigation the core of future rural economic growth and developmental paradigms.

3) Water footprints, virtual water trades and formal water markets are other alternatives for saving water. However, these measures are yet to emerge from policy papers.

The virtual water imported from water abundant regions of India such as Indo-Gangetic, Brahmaputra plains, coastal India etc., to water stressed regions of peninsular India will bring real savings in freshwater with hardly any capital costs of the magnitude seen with the implementation of micro-irrigation.

4) Captive solar plants can replace grid electricity or function in tandem during power outages in the short term or at least till such time India's energy crisis is overcome in future. But it possesses drawbacks in being capital intensive and with a scope to exploit more groundwater.

**5) Micro-irrigation is no substitute for these alternatives in terms of freshwater saved.** Hence, governments have to prioritize planned cropping patterns backed by stringent laws and administrative capacity to monitor cultivation of less water intensive crops. Governments in India have to review the current micro-irrigation strategy to avoid chaos in India's water management.

## **REFERENCES**

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