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# Per Drop More Crop Expands Micro-Irrigation Coverage, Strengthening Water Efficiency, Farm Productivity and Climate-Resilient Agriculture

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## Recent Developments:

The Government has highlighted the expanding role of the **Per Drop More Crop (PDMC)** scheme in improving farm-level **water-use efficiency, agricultural productivity and resource-efficient agriculture**.

As of **July 2026**, more than **115 lakh hectares** have been brought under micro-irrigation through PDMC, representing approximately **8.11% of India's net sown area**.

During **2025–26**, Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu, Gujarat and Rajasthan recorded the highest area coverage, while approximately **12.30 lakh farmers** benefited during the year, including nearly **20% women beneficiaries**.

Digital implementation and **Direct Benefit Transfer (DBT)-based financial assistance** have improved transparency and facilitated farmer access to micro-irrigation systems.

During **2025–26**, **₹8,957.72 crore** was released or sanctioned under the **Pradhan Mantri Rashtriya Krishi Vikas Yojana (PM-RKVY)**, including **₹3,226.36 crore specifically for PDMC**.

The growing coverage is significant because agriculture uses more than **80% of India's available water resources**, while only around **50% of the net sown area** has access to irrigation facilities.

## About Per Drop More Crop:

### *Objectives and Nature of the Scheme:*

**Per Drop More Crop (PDMC)** promotes efficient and precise use of irrigation water through **micro-irrigation systems**, particularly drip and sprinkler irrigation.

The scheme seeks to deliver water close to the crop root zone or crop canopy with minimum conveyance and application losses, thereby improving **water-use efficiency and crop productivity**.

PDMC is a **Centrally Sponsored Scheme** and is currently implemented under the **Pradhan Mantri Rashtriya Krishi Vikas Yojana (PM-RKVY)**.

Its broader objectives include **reducing water wastage, lowering cultivation costs, improving farm productivity, increasing farmers' incomes and promoting sustainable agricultural practices**.

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### ***Evolution of the Scheme:***

The initiative began in **January 2006** as the **Centrally Sponsored Scheme on Micro Irrigation**.

It was upgraded into the **National Mission on Micro Irrigation (NMMI)** during **2010–11**.

During **2014–15**, micro-irrigation became part of the **National Mission for Sustainable Agriculture (NMSA)** under the **On-Farm Water Management (OFWM)** component.

From **2015–16 to 2021–22**, it was implemented as **Per Drop More Crop** under the **Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)**.

Since **2022–23**, PDMC has been implemented under **PM-RKVY**, reflecting the rationalisation and convergence of centrally sponsored agricultural schemes.

### **Financial Assistance and Coverage:**

#### ***Farmer Support:***

PDMC provides financial assistance for installing micro-irrigation systems on up to **5 hectares per beneficiary**.

**Small and marginal farmers receive 55% financial assistance**, while other farmers receive **45% assistance** based on the approved unit cost.

Financial assistance is increasingly delivered through **Direct Benefit Transfer mechanisms**, which can improve transparency and reduce intermediaries in subsidy delivery.

The scheme is particularly relevant for smallholders because the high initial cost of drip and sprinkler infrastructure remains an important barrier to technology adoption.

#### ***Expansion of Micro-Irrigation:***

PDMC has brought more than **115 lakh hectares** under micro-irrigation since its inception, indicating substantial expansion in farm-level water-saving technologies.

The coverage includes both **drip irrigation and sprinkler irrigation**, enabling technology adoption across different crops, soil conditions and agro-climatic regions.

Despite this progress, the proportion of India's total agricultural land under micro-irrigation remains limited, indicating significant scope for further expansion.

Wider adoption is particularly important in **water-stressed, groundwater-depleted and drought-prone regions**, where conventional flood irrigation can impose substantial pressure on scarce water resources.

### **Micro-Irrigation Systems under PDMC:**

#### ***Drip Irrigation:***

**Drip irrigation** supplies water slowly and directly to the plant root zone through emitters attached to a network of pipes and lateral tubes.

The system reduces evaporation, runoff and unnecessary water application while enabling relatively precise irrigation.

**On-line drip systems** use separately installed emitters and are suitable for crops with irregular plant spacing, particularly orchards and several horticultural crops.

**In-line drip systems** have emitters incorporated into pipes at fixed intervals and are suitable for crops with regular plant spacing.

Drip irrigation can also facilitate **fertigation**, in which soluble fertilisers are delivered along with irrigation water directly to the root zone.

### ***Sprinkler Irrigation:***

**Sprinkler irrigation** distributes water under pressure through pipes and nozzles, producing an effect similar to rainfall.

It is suitable for several cereals, pulses, spices, seeds and field crops, especially where uniform surface irrigation is difficult.

**Portable sprinklers** have movable pipe networks and can be shifted according to crop requirements and field conditions.

**Micro sprinklers** are suitable for leafy vegetables, nurseries and seedlings and can also help regulate the micro-climate around crops.

**Mini sprinklers** are useful for closely spaced crops such as groundnut, potato, onion, ginger and short-stature fodder crops, while also offering frost-protection benefits in suitable conditions.

**Semi-permanent sprinklers** use permanently installed underground pipelines with movable sprinkler assemblies for targeted irrigation.

**Large-volume sprinklers or rain-guns** can irrigate extensive areas within a relatively short period and are used for large-scale field irrigation.

### **Focus Areas of PDMC:**

#### ***Precision Water and Nutrient Management:***

PDMC promotes **precision water management** by supplying irrigation water in quantities and locations appropriate to crop requirements.

The scheme promotes **fertigation**, which can improve nutrient-use efficiency and reduce the loss of fertilisers from excessive or poorly targeted application.

Micro-irrigation can also reduce the energy required for pumping where lower volumes of irrigation water are needed.

Integration with **tube wells, river-lift irrigation and solar-powered irrigation systems** enables convergence between water-management and clean-energy initiatives.

#### ***Water Conservation and Local Flexibility:***

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PDMC guidelines provide flexibility for States and Union Territories to undertake **micro-level water-storage and conservation activities**.

These activities include structures such as **diggis, farm ponds, storage tanks and water-harvesting systems** under the **Other Interventions component**.

Earlier expenditure ceilings limited the share of allocations that could be used for such activities, but revised guidelines provide greater flexibility according to local agricultural and water-management requirements.

This approach is important because **micro-irrigation improves the efficiency of water use but cannot substitute for adequate water availability and local water-storage infrastructure**.

### **PM-RKVY and the Institutional Framework:**

#### ***Umbrella Scheme for Sustainable Agriculture:***

The Union Cabinet approved the rationalisation of centrally sponsored agricultural schemes in **October 2024**, creating two umbrella schemes: **PM-RKVY** and **Krishonnati Yojana**.

PM-RKVY is designed to promote **sustainable agriculture, climate resilience, value-chain development and State-level flexibility**.

It includes components relating to **soil health management, rainfed area development, agroforestry, agricultural mechanisation, Per Drop More Crop, crop diversification and agricultural start-up support**.

States can reallocate funds among components according to State-specific agricultural priorities, improving convergence and reducing rigid scheme-wise fragmentation.

#### ***Implementation Architecture:***

PDMC follows the institutional framework of PM-RKVY and operates through coordinated mechanisms at the national, State and district levels.

National-level institutions provide **strategic direction, planning support and overall monitoring**, while State governments prepare and implement agriculture-specific plans.

State-level committees approve implementation plans and facilitate coordination among concerned departments.

District-level mechanisms supervise field implementation and coordinate beneficiary identification, technology deployment and monitoring.

Effective implementation requires convergence among **agriculture, horticulture, water resources, rural development, energy and digital-governance institutions**.

### **Impact of Micro-Irrigation:**

#### ***Water, Energy and Input Savings:***

Evaluations have found that micro-irrigation can substantially improve **water-use efficiency** by reducing losses associated with conventional irrigation methods.

The **Economic Survey 2020–21** reported water savings of **20%–48%**, energy savings of **10%–17%**, labour-cost reductions of **30%–40%** and fertiliser savings of **11%–19%** in relevant micro-irrigation applications.

Micro-irrigation can therefore create a **water-energy-input nexus**, where efficient water use also reduces pumping requirements, labour needs and fertiliser wastage.

NITI Aayog-supported research has similarly identified micro-irrigation as an important instrument for addressing water scarcity, labour shortages and improving agricultural productivity.

### ***Productivity and Farmers' Income:***

Micro-irrigation has been associated with improved crop productivity because water and nutrients can be supplied more precisely according to crop requirements.

Available assessments have reported **20%–38% increases in crop yields** in suitable applications, although outcomes vary according to crop type, soil conditions, technology quality and farm-management practices.

NITI Aayog-linked assessments have also reported improvements in water-use efficiency and farmers' incomes among beneficiaries.

Higher productivity combined with savings in water, fertiliser, energy and labour can improve the **profitability and resilience of farming systems**.

### **Challenges and Limitations:**

#### ***Barriers to Wider Adoption:***

The initial capital cost of micro-irrigation systems remains a major barrier, particularly for small and marginal farmers despite subsidy support.

Farmers may face difficulties relating to **credit access, maintenance, replacement of damaged components and availability of technical support**.

Small and fragmented landholdings can increase installation complexity and reduce economies of scale.

Inadequate awareness regarding crop-specific irrigation scheduling may prevent farmers from achieving the full benefits of precision irrigation.

Poor-quality equipment or inadequate post-installation support can reduce system durability and discourage future adoption.

#### ***Water-Saving Paradox and Groundwater Governance:***

Improved irrigation efficiency does not automatically guarantee proportional reductions in total water extraction because farmers may expand irrigated areas or shift towards more water-intensive crops.

Therefore, micro-irrigation should be complemented by **groundwater regulation, crop diversification, appropriate electricity pricing, water budgeting and local water governance**.

Convergence with programmes promoting alternatives to water-intensive crops is particularly important in regions experiencing persistent groundwater depletion.

The long-term objective should therefore move from merely “**using less water per hectare**” to **improving overall water productivity and sustainability at the basin and aquifer level**.

### Significance for India:

#### *Climate-Resilient and Sustainable Agriculture:*

Increasing climate variability is expected to intensify droughts, irregular rainfall and water stress, making efficient irrigation increasingly important.

PDMC can strengthen **climate resilience** by enabling farmers to use limited water supplies more efficiently.

Micro-irrigation also supports horticulture, crop diversification and cultivation on marginal land where conventional irrigation may be inefficient.

#### *Food and Water Security:*

Agriculture must simultaneously increase productivity while reducing pressure on increasingly scarce freshwater resources.

PDMC contributes to this objective by promoting **higher agricultural output per unit of water**, which is central to long-term water and food security.

Its integration with water harvesting, solar irrigation, fertigation and digital subsidy delivery makes it a multidimensional instrument for agricultural transformation.

### Conclusion:

**Per Drop More Crop** represents an important transition from conventional water-intensive irrigation towards **precision, efficient and climate-resilient agriculture**.

With more than **115 lakh hectares** covered under micro-irrigation by July 2026, the scheme has achieved substantial scale and demonstrated its relevance for water conservation and farm productivity.

However, future success will depend not merely on expanding subsidised equipment but on ensuring **quality infrastructure, farmer training, maintenance support, groundwater governance and crop diversification**.

A comprehensive approach linking **micro-irrigation with watershed management, water budgeting and climate-smart agriculture** can make PDMC a more effective instrument for achieving sustainable agricultural growth and long-term water security.

### Value Addition for UPSC:

#### *Possible Mains Question:*

**“Micro-irrigation can improve agricultural productivity and water-use efficiency, but technological efficiency alone cannot ensure sustainable water management.” Discuss with reference to the Per Drop More Crop scheme.**