Geography · GS - I

In what way micro-watershed development projects help in water conservation in drought-prone and semi-arid regions of India?

EXAM YEAR	PAPER	SUBJECT
2016	GS - I	Geography

MARKS	WORD LIMIT
15	~250 words

Answer Hint

Watershed approach; rainwater harvesting; groundwater recharge; soil-moisture conservation; erosion control; community participation; drought resilience; sustainable livelihoods

Model Answer

Introduction

Micro-watershed development manages land, water and vegetation within a small drainage area as an integrated ecological unit. It is especially valuable in drought-prone and semi-arid regions where rainfall is limited, irregular and concentrated in short periods.

How Micro-Watershed Projects Conserve Water

1. Rainwater Harvesting

Structures such as check dams, farm ponds, percolation tanks and contour trenches capture runoff and reduce the rapid loss of rainwater.

2. Groundwater Recharge

Slowing surface runoff allows more water to infiltrate the soil, helping replenish groundwater and sustain wells where geological conditions permit.

3. Soil-Moisture Conservation

Contour bunding, terracing, mulching and vegetative barriers reduce runoff and help retain moisture in agricultural fields.

4. Reduction in Soil Erosion

Vegetative cover and suitable drainage treatments reduce soil loss and sedimentation in water bodies. This protects the productive topsoil needed for agriculture.

5. Improved Agricultural Productivity

More reliable soil moisture can support crop growth, horticulture and, in suitable locations, supplementary irrigation. Farmers may also diversify cropping patterns and reduce dependence on a single rain-fed crop.

6. Ecosystem Restoration

Afforestation with suitable native species, pasture development and protection of degraded commons improve infiltration and reduce land degradation when implemented appropriately.

7. Community Participation

Watershed committees and village institutions can coordinate construction, maintenance and equitable use of water resources. Community involvement is essential to prevent over-extraction and ensure long-term benefits.

Broader Benefits

Successful projects can improve drinking-water availability, livestock support, rural employment and resilience to drought. However, outcomes depend on local geology, rainfall, maintenance and fair distribution of benefits.

Conclusion

Micro-watershed development strengthens water security by conserving runoff, improving infiltration and protecting soil. Integrated planning and community-led management are essential for durable results in India's drought-prone regions.

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