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Q13

What are the major challenges faced by Indian irrigation system in recent times? State the measures taken by the government for efficient irrigation management.

UPSC Civil Services Mains 2024 · GS III · 15 marks · Crops, Irrigation and Marketing

Major crops - cropping patterns in various parts of the country; different types of irrigation and irrigation systems; storage, transport and marketing of agricultural produce and issues and related constraints; e-technology in the aid of farmers.

Core demand of the question

- Name major recent challenges of the Indian irrigation system
- State government measures for more efficient irrigation management
- Keep groundwater, climate and last-mile water together

Revision summary

Indian irrigation is stressed by falling groundwater, leaky canals, climate swings, fragmented plots and cheap farm power.

Tube-wells now dominate many States; north-western paddy-wheat is a leading depletion case.

PMKSY bundles access, per-drop-more-crop micro-irrigation and watersheds.

Atal Bhujal supports community groundwater budgets in stressed blocks; command-area lining and water-user associations target the canal tail.

Solar pumps help energy but can increase extraction unless paired with a water limit and crop shift.

Introduction

Indian irrigation is still the difference between a **stable grain bowl** and a **rain gamble**. The system is under stress that is **recent as well as old**: aquifers falling, canals leaking, climate swinging, and a power-water nexus that pays farmers to **pump the future dry**. Efficiency is therefore not a sprinkler catalogue. It is **governance of a shared, shrinking litre**.

Body

Challenges in recent times

Groundwater now waters more Indian plots than canals in many States, and the water table in **Punjab, Haryana, western UP, Rajasthan and parts of the peninsula** has been in long decline. **Canal irrigation** still loses a large share to seepage and theft before the tail-enders see a wetting. **Climate makes the monsoon burstier: a flood week, then a dry spell, which wrecks both reservoir scheduling and a rainfed sowing**. **Fragmented holdings** make field channels expensive. **Energy subsidies** for pump-sets turn groundwater into a **free common**. **Waterlogging and salinity** persist in some command areas. **Inter-State river**

disputes delay projects. Urban and industrial demand now **competes** with the field. Maintenance of **minor irrigation** tanks in the south and east has lagged, even though those tanks were climate buffers. The challenge is therefore **too much pumping, too little last-mile, and a climate that no longer matches the old reservoir rule-curve**.

- **Peg:** Tube-well India and canal India are two systems; both are stressed, for different reasons.
- **Peg:** The paddy-wheat MSP couple in the north-west is a groundwater story as much as a food story.

Measures for efficient management

PMKSY (Pradhan Mantri Krishi Sinchayee Yojana) is the umbrella: **Har Khet Ko Pani** for access, **Per Drop More Crop** for micro-irrigation, and watershed work. **Atal Bhujal Yojana** pays for **community groundwater management** in notified water-stressed blocks. **Command Area Development** and lining try to finish the last mile of old dams. **Drip and sprinkler** subsidies, often through State missions, cut flood irrigation on horticulture and sugarcane. **Participatory Irrigation Management** and **Water User Associations** are meant to take the outlet out of a purely departmental hand. **Solar pumps** (including **KUSUM**) cut diesel but can **worsen extraction** unless they are paired with **feeder separation or a water budget**. **River-linking** is a larger, contested structural bet; efficiency first is the cheaper claim. **Crop diversification** out of paddy in depleted blocks is the agricultural measure that irrigation engineering cannot skip.

- **Peg:** **PMKSY** plus Atal Bhujal is the Union's efficiency pair: more crop per drop, and less reckless pumping.
- **Peg:** A solar pump without a water budget is a cleaner way to empty the aquifer.

Crop, power and federal water

Engineering fails if the **crop and the tariff** still reward waste. A **paddy-wheat MSP** couple on a falling water table cannot be cured only by a lined canal. **Feeder separation**, a **water budget**, and **diversification** are irrigation policy by other names. **Inter-State river** machinery (tribunals, the **Inter-State River Water Disputes Act**) still decides whether a dam's water ever becomes a field's water. Efficiency is therefore **agronomy plus electricity plus federal bargaining**, not only a drip-pipe tender.

- **Peg:** Cheap night power for pumps is an irrigation subsidy that can erase a micro-irrigation gain.
- **Peg:** A tribunal award without last-mile canals is a legal litre, not a wet field.

Flow diagram

Falling groundwater -> Irrigation stress
 Canal last-mile loss -> Irrigation stress
 Climate bursts -> Irrigation stress
 PMKSY micro-irrigation -> Efficient management
 Atal Bhujal WUA -> Efficient management
 Efficient management -> Irrigation stress

Conclusion

Recent irrigation stress is falling groundwater, leaky canals, climate swings and cheap power to pump. Government measures - **PMKSY**, micro-irrigation, Atal Bhujal, command-area work - aim at efficiency. They work only if the crop and the tariff stop rewarding waste.

Facts & figures

PMKSY

Pradhan Mantri Krishi Sinchayee Yojana, the Union umbrella for irrigation access and water-use efficiency.

Per Drop More Crop

The micro-irrigation component: drip and sprinkler to raise output per unit of water.

Atal Bhujal Yojana

A groundwater-management scheme focused on community water budgets in notified stressed areas.

WUA / PIM

Water User Associations and participatory irrigation management, meant to run the outlet with farmers, not only the department.

KUSUM

A solar-pump and solar-feeder programme; efficiency depends on not using free sun to over-extract.

Command area

The unfinished last mile below a dam or canal; lining and field channels decide whether the tail-ender is irrigated.

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