# Intensive agriculture led to unsustainable groundwater use



**(MAINS GS 3 : Agriculture: Major 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)**

**Context:**

- India is the second-largest producer of wheat in the world, with over 30 million hectares in the country dedicated to producing this crop.
- But with severe groundwater depletion, the cropping intensity or the amount of land planted in the winter season may decrease by up to 20% by 2025.
- Some of the important winter crops are wheat, barley, mustard and peas.

**The key findings:**

- The international team studied India's three main irrigation types on winter cropped areas: dug wells, tube wells, canals, and also analysed the groundwater data from the Central Ground Water Board.
- They found that 13% of the villages in which farmers plant a winter crop are located in critically water-depleted regions.
- The team writes that these villages may lose 68% of their cropped area in future if access to all groundwater irrigation is lost.
- The results suggest that these losses will largely occur in northwest and central India.

**Alternative sources:**

- A recent study  looked at canals to understand if they can be promoted as an alternative irrigation source and as an adaptation strategy to falling groundwater tables.

- But the results showed that “switching to canal irrigation has limited adaptation potential at the national scale.
- Even if all regions that are currently using depleted groundwater for irrigation will switch to using canal irrigation, cropping intensity may decline by 7% nationally.

**Unsuited soils:**

- Experts from the International Maize and Wheat Improvement Center, New Delhi, explains more about the problems wheat farmers face in our country.
- According to them, there are several first-generation (productivity) and second-generation (sustainability) problems.
- In the green revolution era, policy-supported environment led to a large increase in rice cultivation in northwestern India mainly in Punjab and Haryana which are ecologically less suitable for rice cultivation due to predominantly light soils.
- This policy-supported intensive agriculture led to unsustainable groundwater use for irrigation and in turn groundwater scarcity.
- There was also post-harvest residue burning to make way for the timely sowing of wheat.

**Poor infrastructure:**

- There are enough groundwater resources supported with higher monsoon rainfall in eastern Indian states like Bihar.
- But due to lack of enough irrigation infrastructure, farmers are not able to make use of natural resources there.
- Thus, the country needs better policies in eastern India to expand irrigation and increase agricultural productivity. This will also release some pressure from northwestern Indian states.

**Conclusion:**

For less groundwater depletion and sustainable agriculture, India needs to adopt water-saving technologies like a sprinkler, drip irrigation along with less water intensive crops especially in areas of limited groundwater resources.