Water and Agriculture

Water Classrooms Lesson 3-3-2
Part 2

What do we know about agriculture and farmers?

1. Imagine you are a farmer. List 3 activities you do that require water.
2. If you were a farmer growing crops all year- round, name 3 possible sources where your water might come from? Answer in 2-3 words/phrases.
3. Would a farmer in Vidarbha in Maharashtra depend on the same water sources as a farmer in West Bengal? Why or why not? If no, then can you identify 2-3 factors that are responsible for the difference?

What do we know about agriculture and farmers?

4. What water sources would each farmer depend on during the Monsoon season? During the winter season?

5. Who is responsible for managing your farming water? The water reaching your home? If your farming water supply and domestic water supply are managed differently, why is this? Explain your answer in 1-2 sentences.

6. Are there any prosperous farmers in India? If yes, identify 2-3 factors that helped them to become rich? If yes, where in the India can we find most of them? What gender are they likely to be?

Why is it important to grow crops that are suited to the soil and climate of a particular region?

Water requirements for different crops

Seasons	Monsoon 'Kharif'	Winter 'Rabi'	Summer 'Zaid'	Annual (Year- long)
High water requirement	Rice, cotton	Wheat	Vegetables, pulses	Sugarcane, turmeric, fruits
Less water intensive	Ragi, tur	Jowar, bajra, gram		Potato

Some important subsistence (food) crops

Some crops require less water (even some varieties of rice)
Clockwise from top:
Ragi/ Naachni (finger millet)
Jowar (sorghum)
Rice
Moong dal
Toor (arhar/ pigeon pea)

Why do farmers go for more water intensive crops when less water intensive ones are available?

(Clockwise from top) Sugarcane, Cotton, different coloured 'Bell Peppers', Dragon Fruit, Broccoli, Strawberries

The reason is the market!

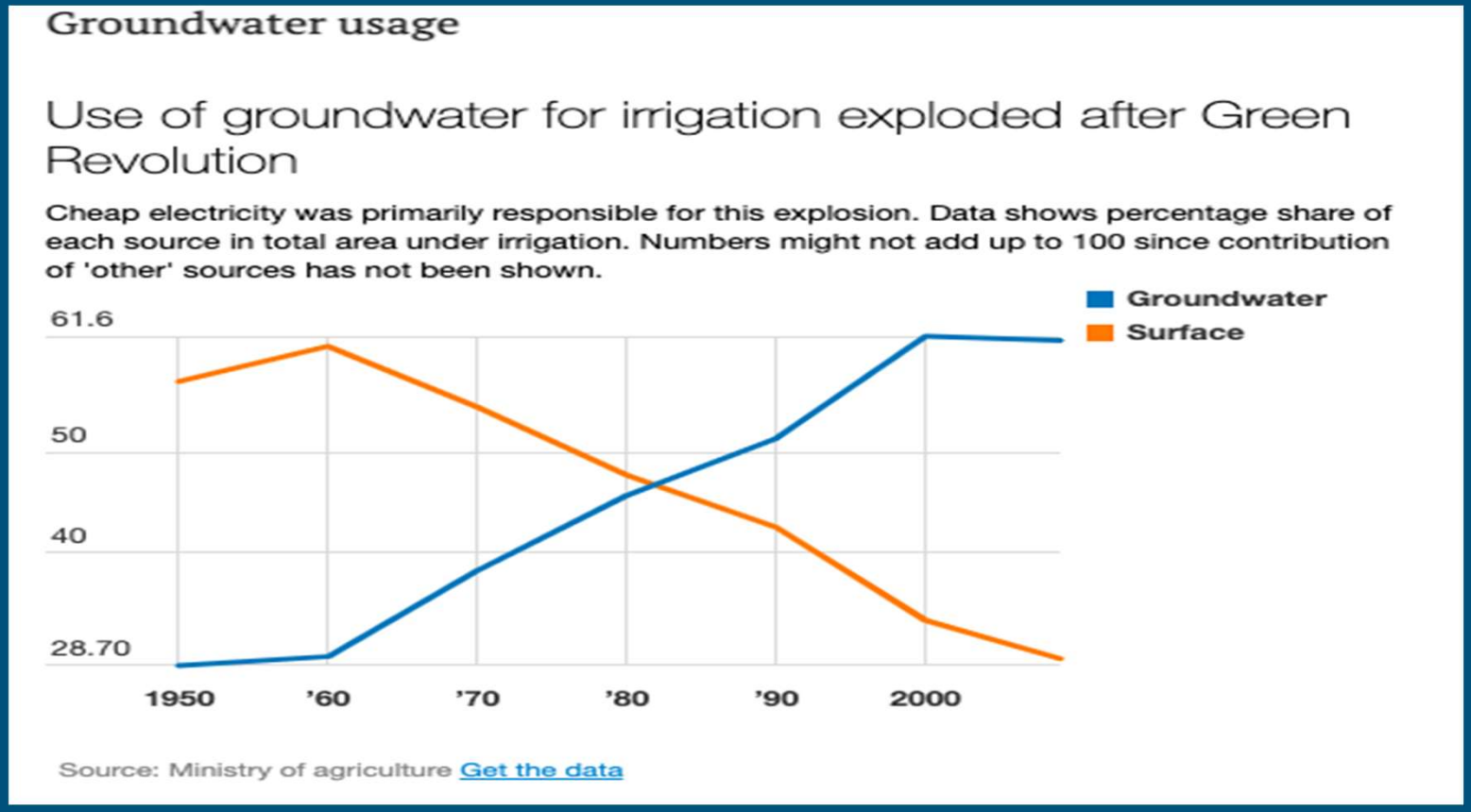
- Not all crop products are equally valued at the market.
- Cash crops like sugarcane and cotton can give more returns than food crops.
- At the same time non- traditional ways of farming increase the cost for farming.
- Farmers choose hybrid varieties of seeds to sustain themselves economically.
- These hybrid crops can guarantee higher yields but they require much more water, fertilizer, and pesticides than traditional seeds.

Water sources

Water storage structures used in irrigation in non-monsoon months. (Clockwise from top) Check dam, canal, borewell, dugwell

Traditional flood irrigation- using furrows

Has groundwater use for irrigation changed?

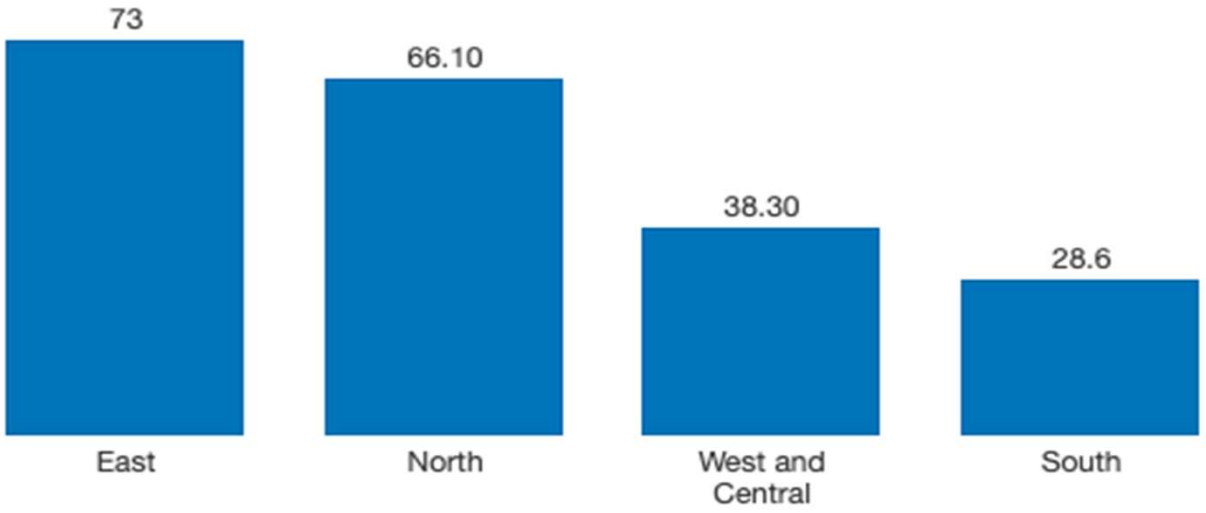


Regional water-table

South, West and Central India have significantly lower water table than other regions

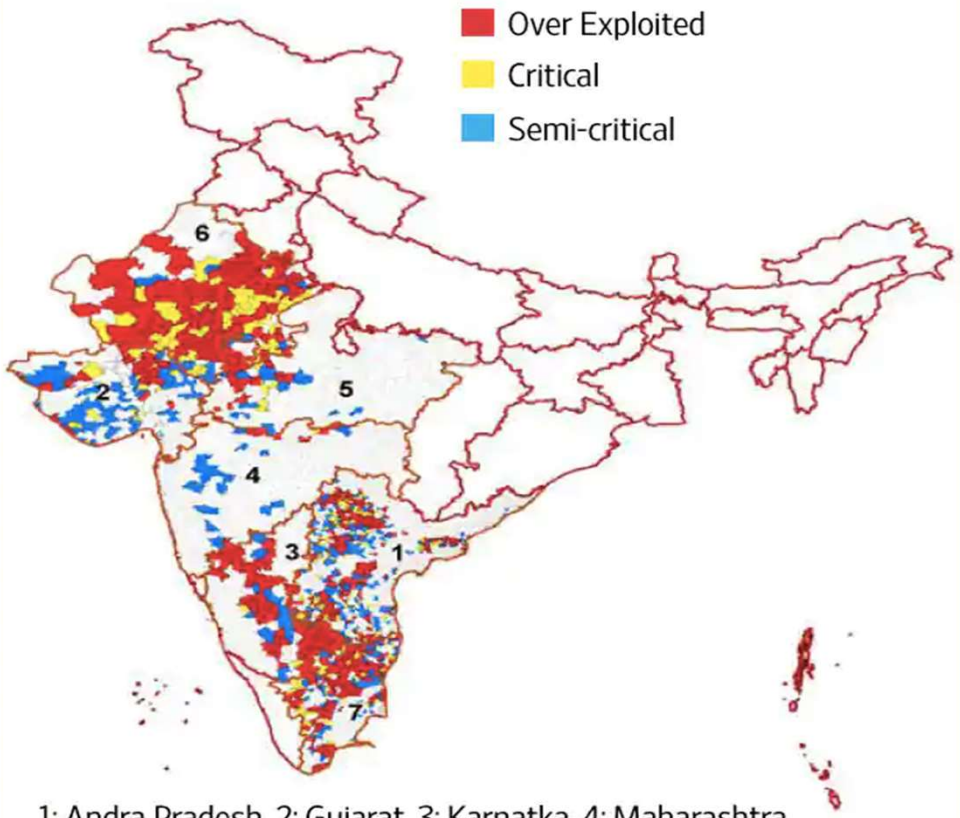
South has a frightening 30% of its groundwater table lower than 60 metres below the ground. Data shows percentage share of groundwater wells according to depth below ground.

Below 10 metre | 10-20 metre | 20-40 metre | 40-60 metre | 60 metre and above



Source: Ministry of water resources Get the data

GROUND WATER STRESSED BLOCKS OF INDIA



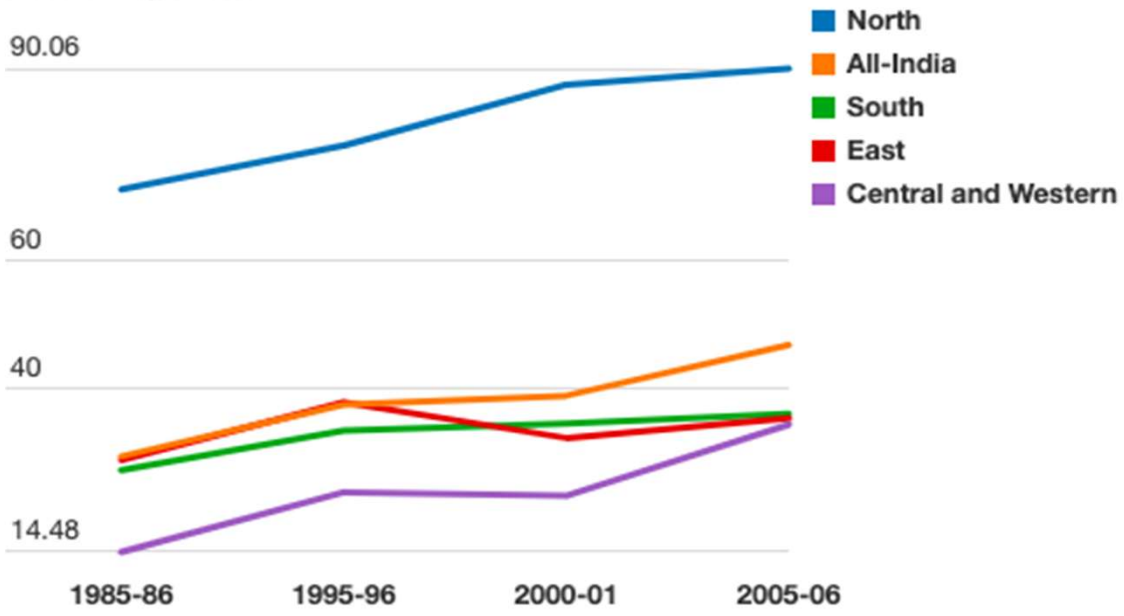
1: Andra Pradesh, 2: Gujarat, 3: Karnatka, 4: Maharashtra,
5: Madhya Pradesh, 6: Rajasthan and 7: Tamil Nadu

Source: IWMI

Regional inequities in irrigation

Regional disparities in irrigation in India

Data shows percentage share of net irrigation to net area used for sowing crops. North enjoys disproportionate advantage over other regions. East is the only region to have shown decline in share of irrigated area.

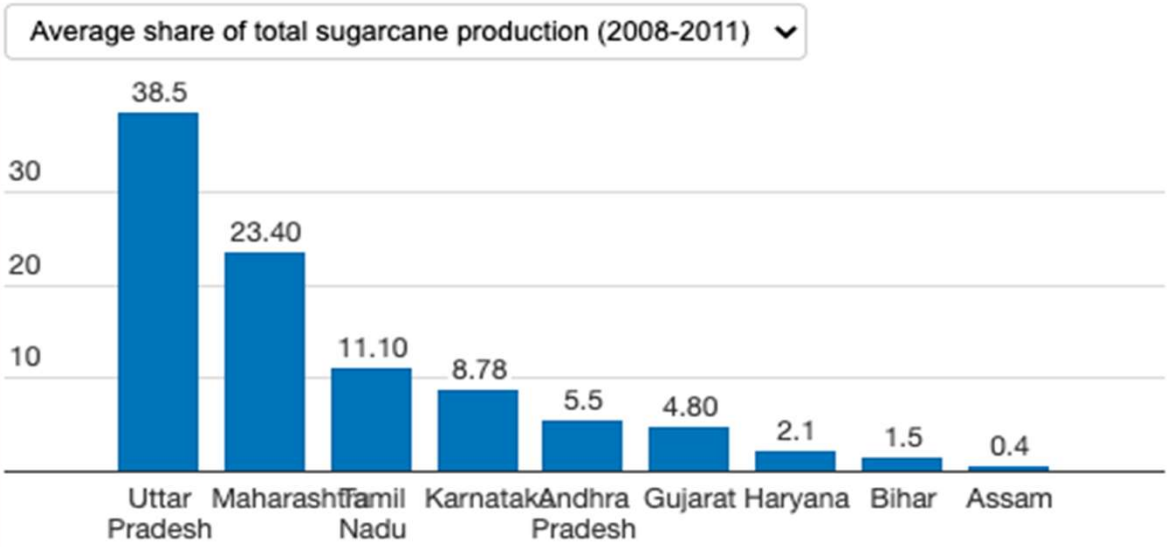


Source: Ministry of water resources Get the data

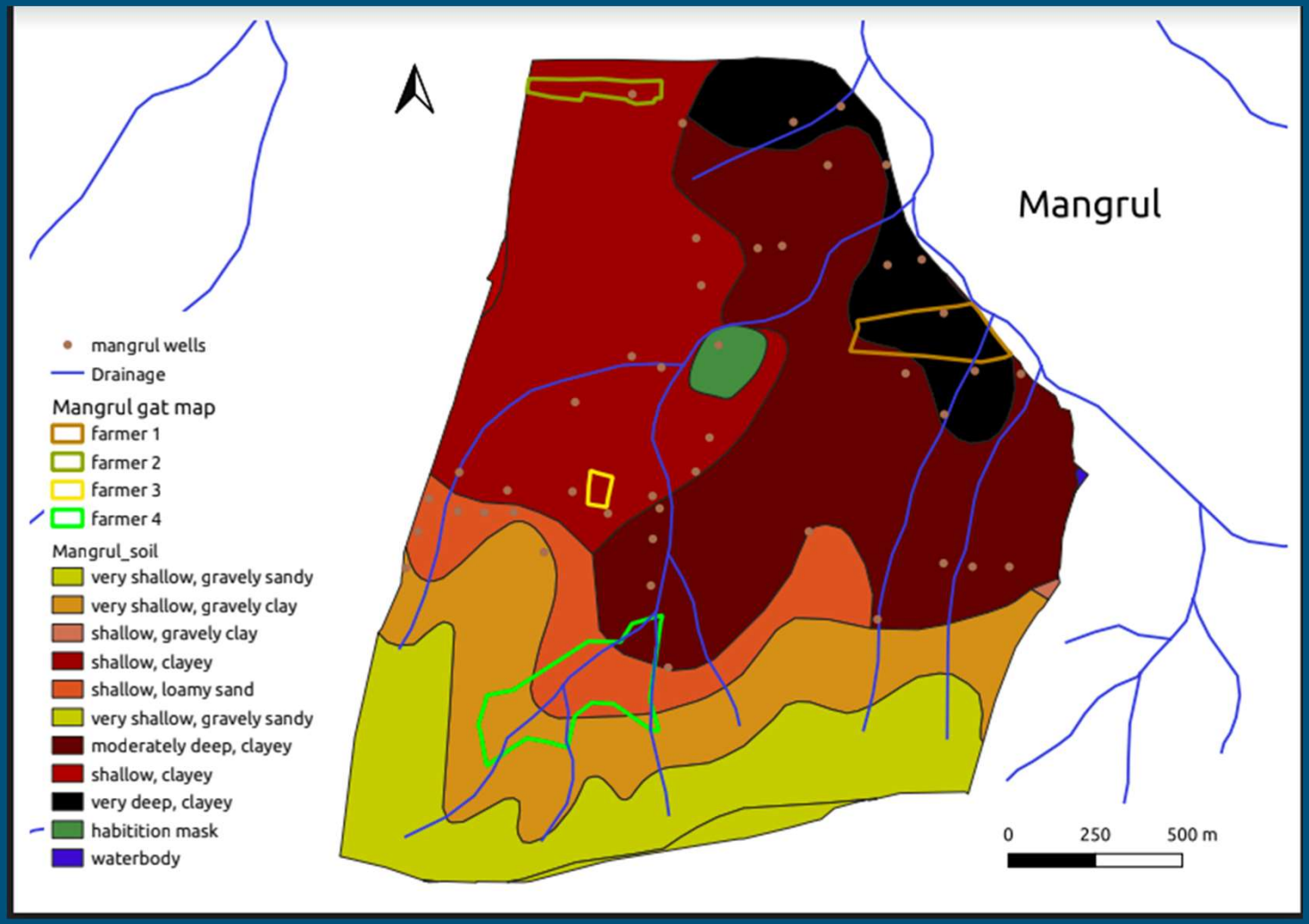
Sugarcane plantation

Sugarcane plantation growing in areas not naturally suited to the crop

Share of water-stressed Maharashtra in total sugarcane production has gone up by nearly 9 percentage points, while water-abundant states like Bihar and Assam have lagged behind



Source: Ministry of agriculture Get the data


Mangrul
mangrul wells
Drainage
Mangrul gat map
farmer 1
farmer 2
farmer 3
farmer 4
Mangrul_soil
very shallow, gravely sandy
very shallow, gravely clay
shallow, gravely clay
shallow, clayey
shallow, loamy sand
very shallow, gravely sandy
moderately deep, clayey
shallow, clayey
very deep, clayey
habitition mask
waterbody
0
250
500 m

Farmer 4: Story of Daji

Daji's farm is large but the soil quality is poor. Daji can afford labourers, hence he handles the management in farming. The remaining work is done by the labourers. Despite having water and huge land he does not take any crop in rabi or summer season. This is because his farm is near a forest area and deer come and destroy the crops- mainly edible crops.

They do not destroy cotton as it is not edible. Daji gets a good yield of cotton. And hence it is fine even if he does not take any other crop in rabi and summer seasons. Other than agriculture he has a small business too.

Based on your understanding of what you have learned about:
-which crops are appropriate to grow in soils that have low or high water- holding capacity, and
-where the amount of groundwater available is low or high,
please *assess* the environmental and economic appropriateness of your farmer's choice of crops from the case study given to you. *Please provide valid reasons for your answers based on what you have learned.*

1. What is the water- holding capacity of your farmer's soil? Is it high, medium, or low?
2. To what extent is your farmer dependent on groundwater for their crop choices?
3. Based on what you have learned so far, to what extent is your farmer's choice of crops environmentally and economically appropriate? *Explain your reasoning.*
4. Suggest some alternative crops for each cropping season (rabi, kharif and zaid) that you think could be more environmentally and economically sustainable for your farmer. *Explain your reasoning.*

But are choice of crops the only thing that will save water and make farming more sustainable?

Non traditional practices of irrigation include sprinklers (left) and drip irrigation (right)