Groundwater Monitoring

Why is Groundwater important?

- India is the largest groundwater user in the world, using 25% of all groundwater extracted every year globally.
- 70% of agriculture and 85% of our drinking water supply depends on groundwater.

The Problem

- Groundwater levels are depleting across the country.
- We don't have data on groundwater levels for most parts of the country.
- Different organizations are collecting data but its not being archived on a single platform
- Lack of good quality, location specific data is a barrier to sustainable management of groundwater.

The Solution

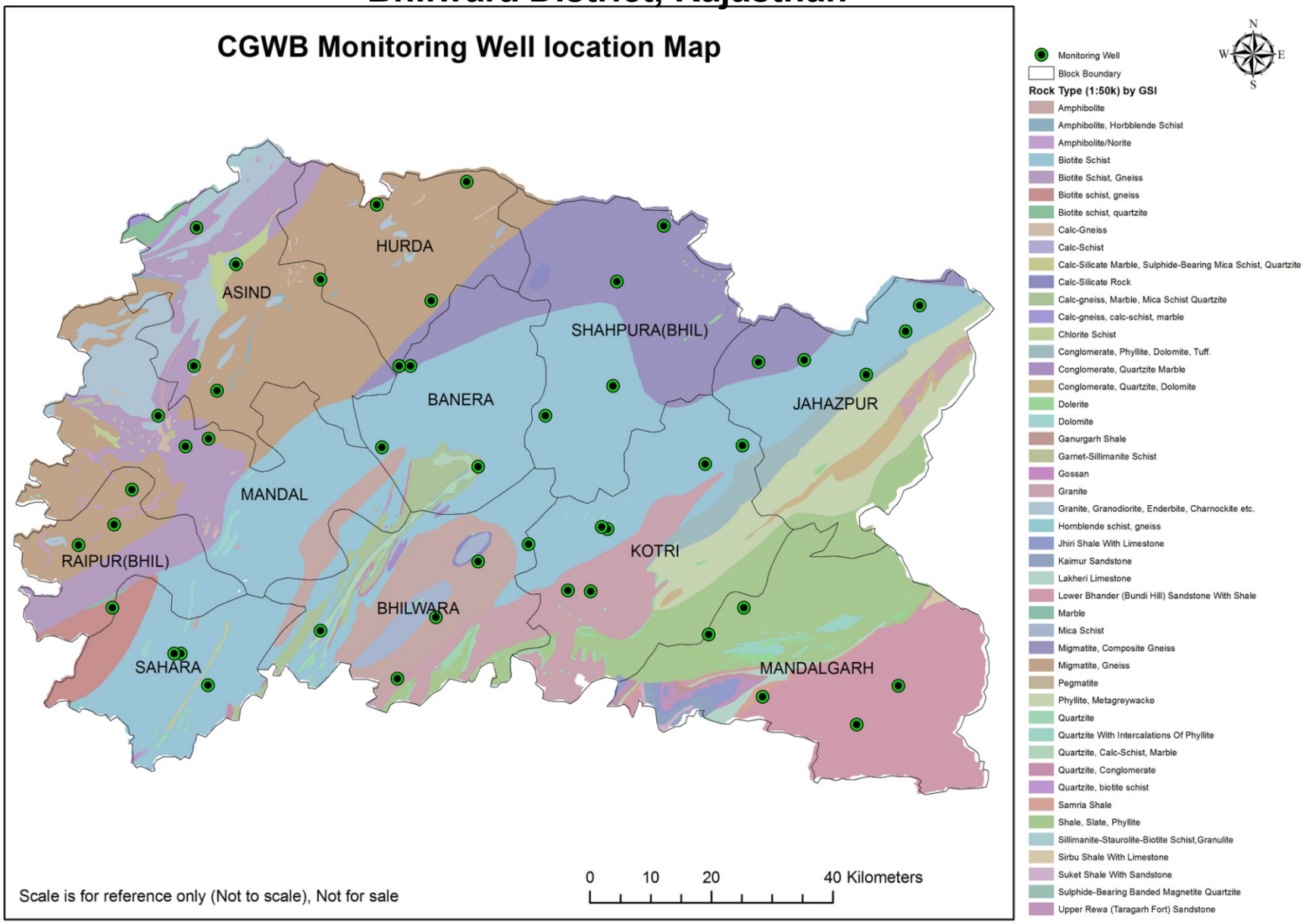
- Monitor groundwater levels by measuring the water level in wells in our area.
- This should be done twice a year - once in the pre-monsoon season and once post-monsoon.

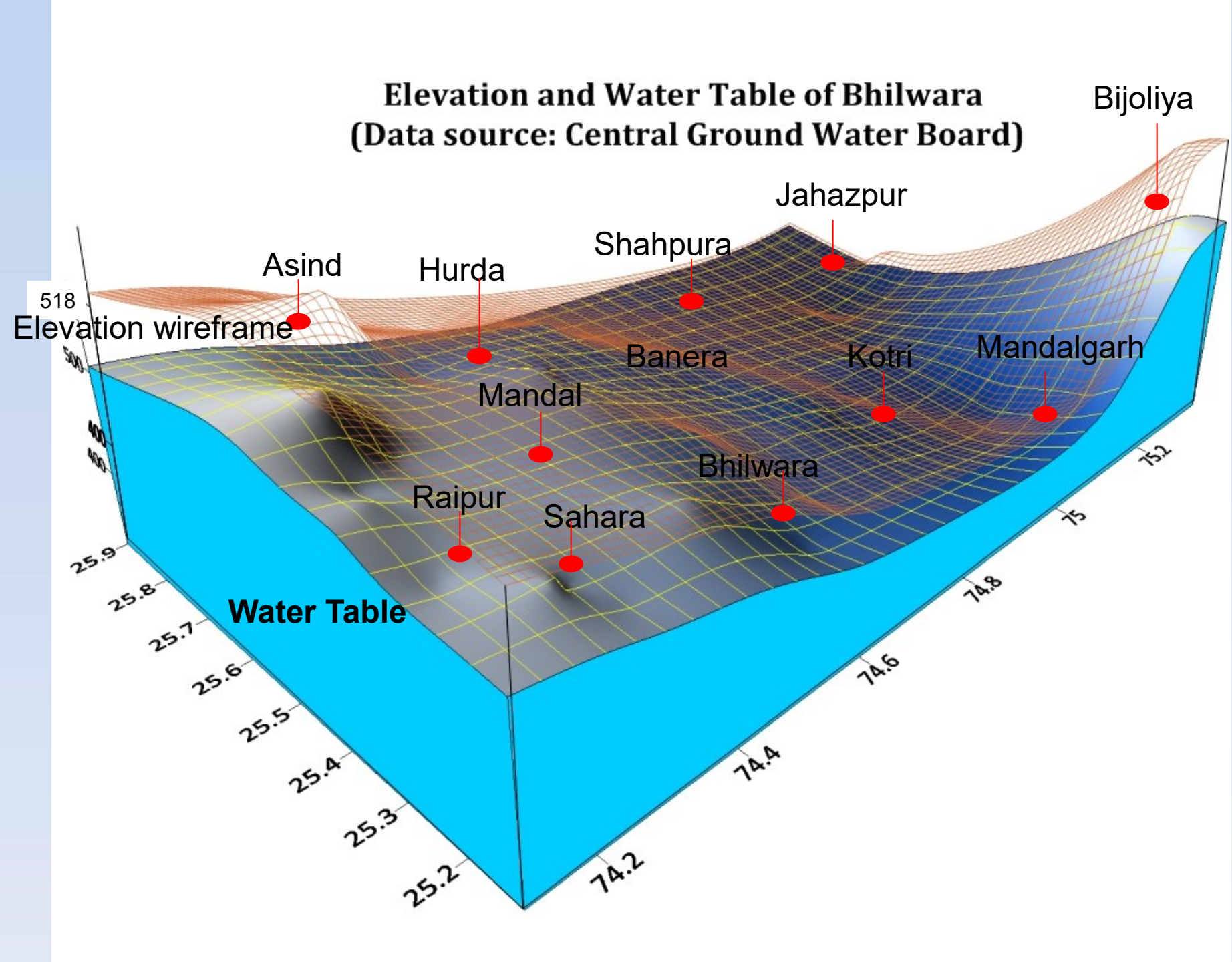
The Outcomes

- Improved understanding of groundwater in our area will help us manage it better.
- Monitoring changes in water level temporally and spatially will help us assess availability and identify recharge discharge zonation of aquifers.
- It will also inform our understanding of impacts of Climate Change – Rainfall, Runoff, Evapotranspiration
- The crowd sourced data will complement CGWB data
- The shared data will be useful for all to create maps, analysis (at different scale)
- A map of groundwater levels in different parts of the country will capture local variations and informs policy and practice.

The Current Scenario

Bhilwara District, Rajasthan



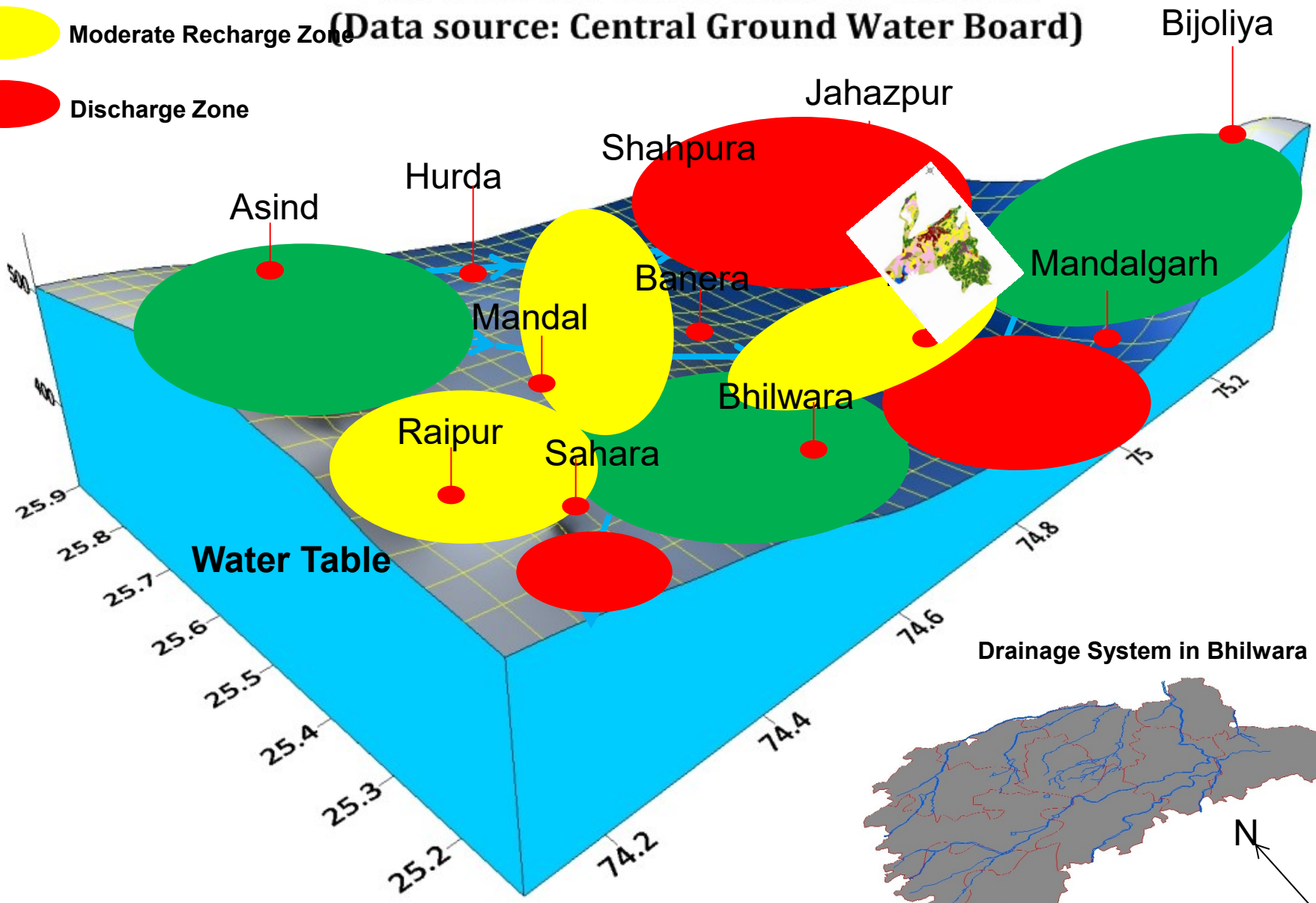

Elevation and Water Table of Bhilwara
(Data source: Central Ground Water Board)
Bijoliya
Jahazpur
Shahpura
Asind
Hurda
518
Elevation wireframe
Banera
Kotri
Mandalgarh
Mandal
Bhilwara
Raipur
Sahara
Water Table
25.9
25.8
25.7
25.6
25.5
25.4
25.3
25.2
74.2
74.4
74.6
74.8
75
75.2

Good Recharge Zone

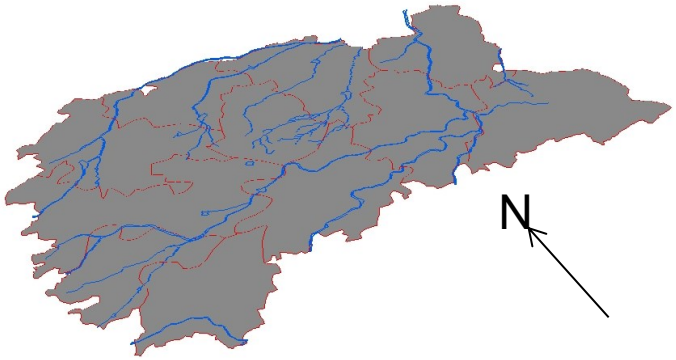
Moderate Recharge Zone

Discharge Zone

Elevation and Water Table of Bhilwara
(Data source: Central Ground Water Board)

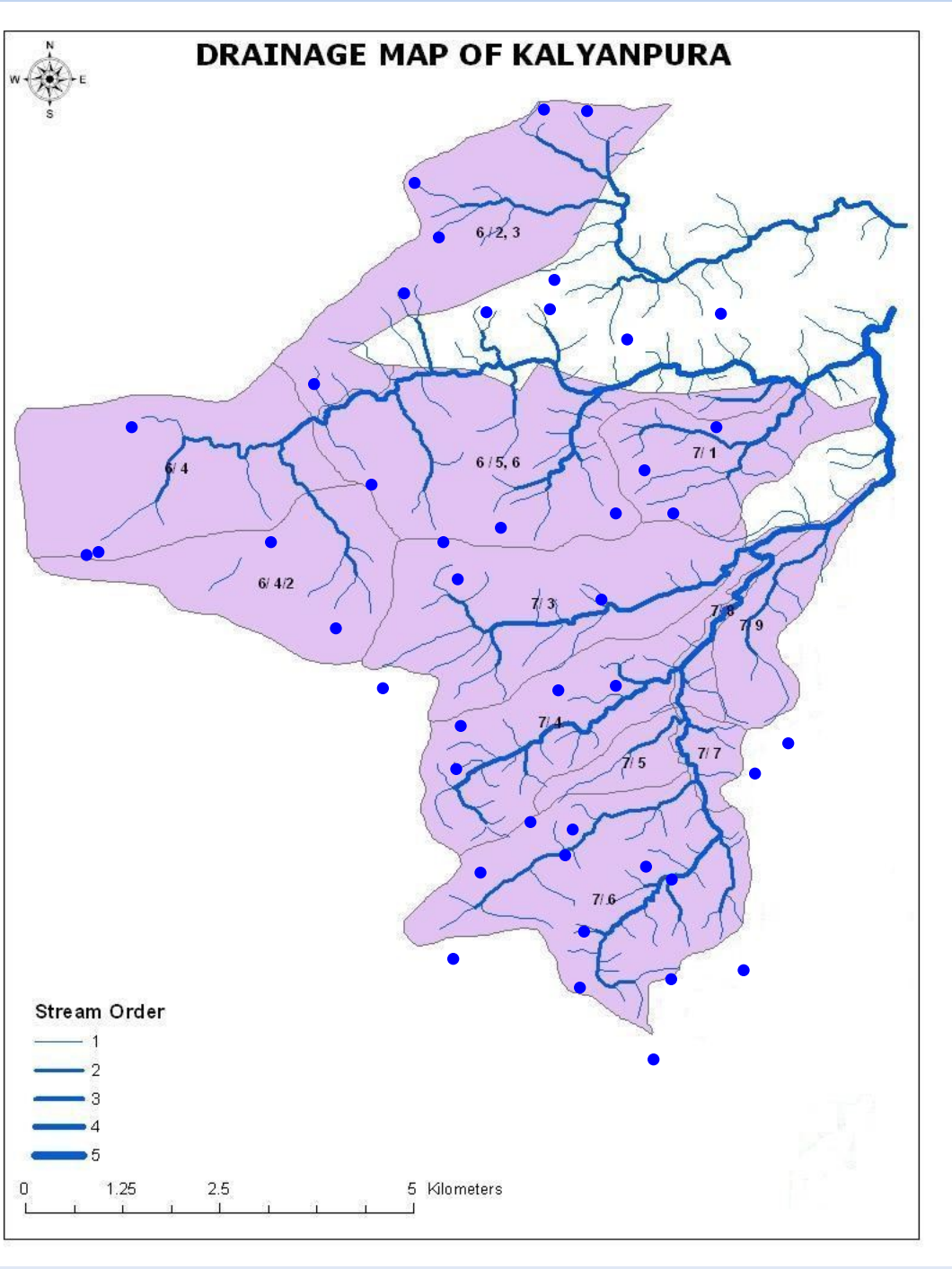


Drainage System in Bhilwara

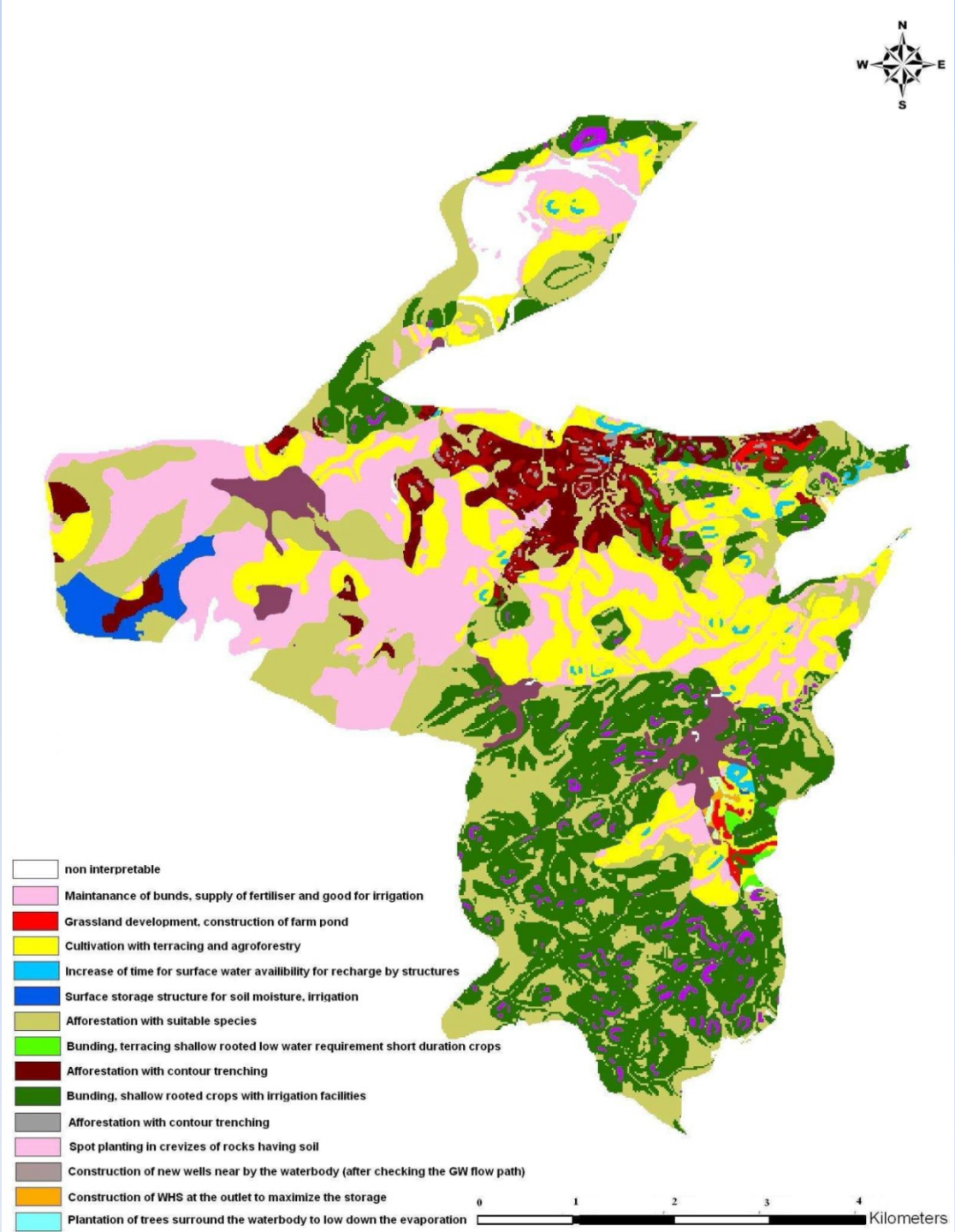


Ground Water flow path

Bhilwara District, Rajasthan



Bhilwara District, Rajasthan



Findings

- Well data is available with Central Ground Water Board (CGWB) (with lat/long) from 2007-2017
- Wells are too sparse (Average =222 sqkm/well) and data is not consistent for all the wells (80% wells are consistent)
- Wells are not on the basis of rock types – hence not representing the true aquifer level picture.
- Sample size is very small and represents regional picture. Not good to integrate in local level inference as reflection of this data will not help.

How can we address this gap?

- Collate decentralised data from NGOs, CBOs
- Common methodology/standards for data collection can ensure data quality
- Pooling together of data will help develop a more detailed picture across the country
- Primary data from a partner can be combined with secondary data on the IO for analysis and partners can request any public dataset to be added to IO

What to do:

- Use the android app available here for easy data collection. The data is uploaded to India Observatory site for producing the 'State of Groundwater in India' Map.
- For instructions on how to use the android app and to know more about this initiative kindly check the GWMT tool web page
- To access the data collected so far, kindly download the app and register yourself at - https://wmt.indiaobservatory.org.in/.
- Share your finding on social media, use the #mapourgroundwater and tag IndiaObservatory.IO on Facebook and Ioforcommons on Twitter

Protocols

1. At least one well per village.
2. If possible choose upto 3 wells far apart from each other in the same village.
3. Distance between two wells – as far as possible within a village
4. We should be able to measure these wells twice a year in the next few years.
5. If a well is dry, please note the total depth of the well so that we know up to what depth below ground there is no water.
6. Take the GPS measurement at the ground level and note the depth to water level also from this same point.
7. Measure water level in meters.
8. If there is a motor connected to the well, please ensure a minimum of 24 hrs gap between the motor being run and the depth being measured.

Protocols Contd….

- If you are equipped and experienced in measuring bore well depths then you are welcome to record depth of bore wells also. Otherwise, you can stick to open wells.
- If you already have a set of wells you are monitoring please feel free to use the same set. If you have data from past seasons/years, we can also import this into the database if you wish to share it.
- If you have different protocols from these, please share with us so that we can adopt best practices and strengthen the initiative.

Please do not violate any lockdown rules or endanger your safety or that of others in the process of recording an observation.

Thank you