

Assessing feasibility of Limestone Aquifer for Managed Aquifer Recharge

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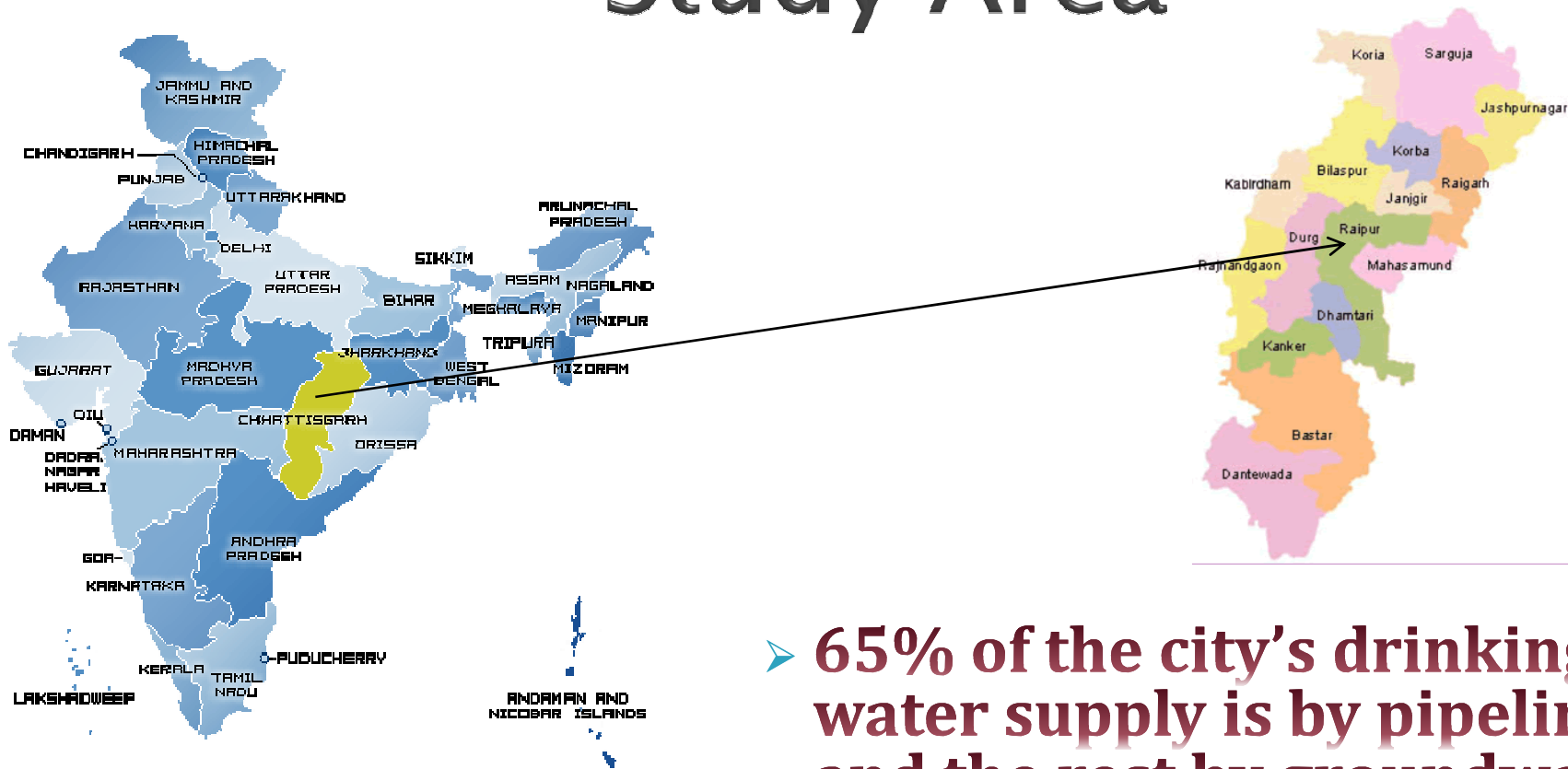
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Managed Aquifer Recharge

- ▶ Managed aquifer recharge (MAR) includes a wide variety of different techniques with which water (e.g. stormwater, surface water or treated waste water) is intentionally introduced into an aquifer to store, treat the water
- ▶ India is now a water stressed country, Groundwater touches every aspect of life, and in India uncertainty over access to and the availability of this basic resource may be reaching crisis levels
- ▶ In India, MAR is an attractive solution to improve water quantity and quality for water stressed

Study Area



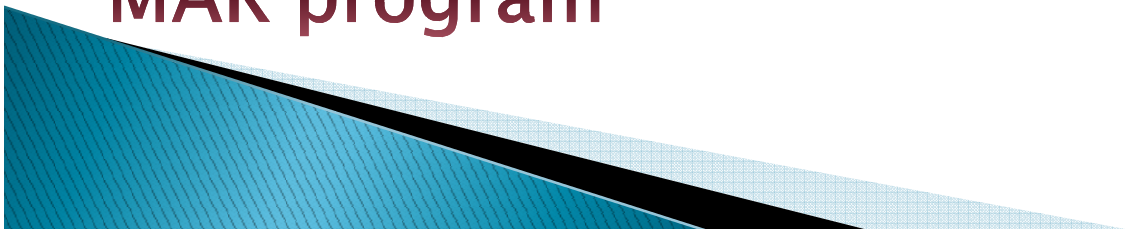
- **65% of the city's drinking water supply is by pipeline and the rest by groundwater.,**
- **excessive withdrawal and depletion of aquifers,**
- **Unmanaged human activities have destroyed natural talabs**
- **Aquifers under stress**

Objective

To develop a conceptual model of the Chandi limestone aquifer which is poorly understood in terms of its hydrogeology and demands detailed research before carrying MAR program in the area

Integrated results from hydrogeology and hydrogeophysical data interpretation

To propose suitable sites for implementation of MAR program



Model development

Database treatment
and documentation

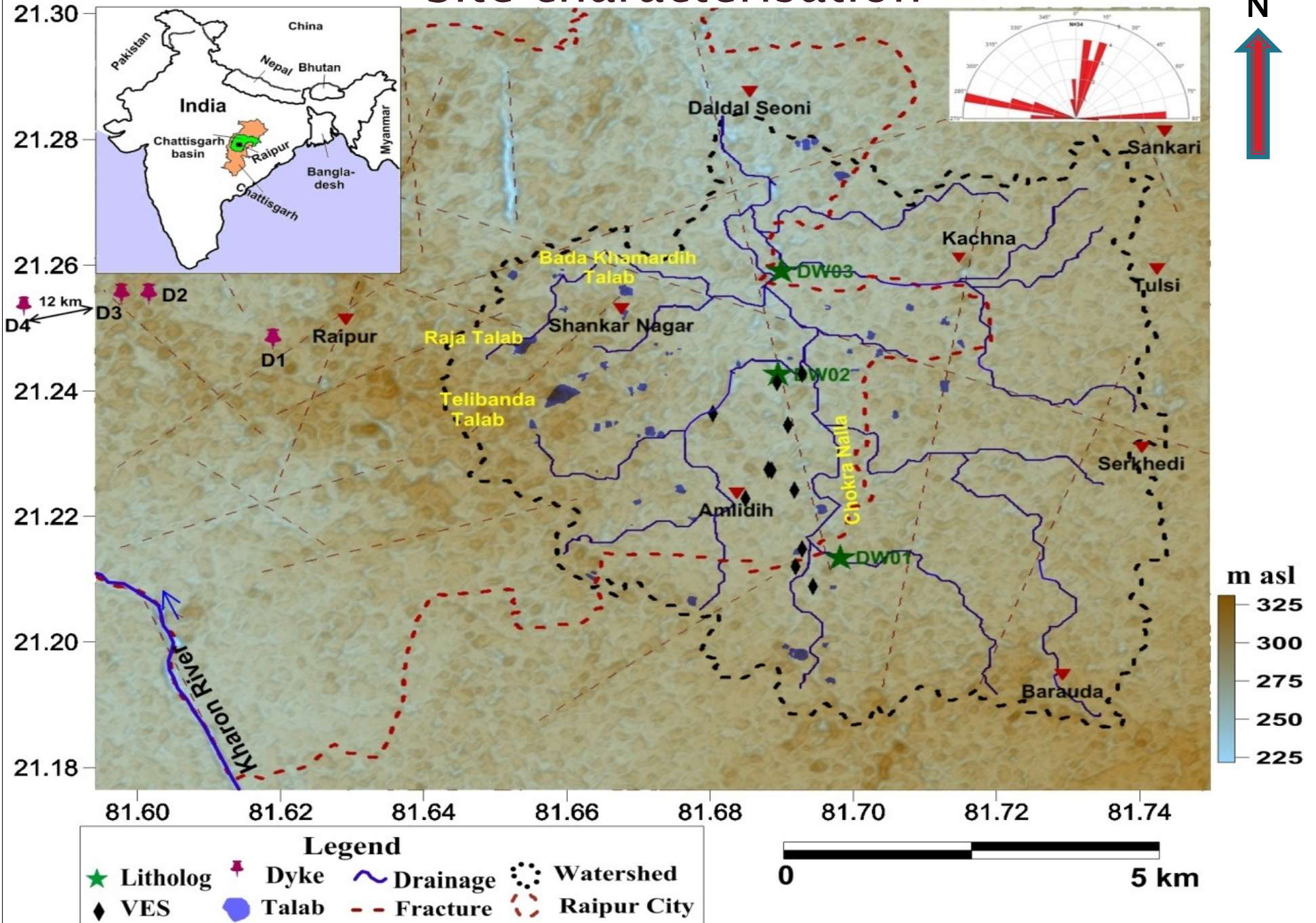
RS/GIS supported
mapping

Geophysics and
other methods

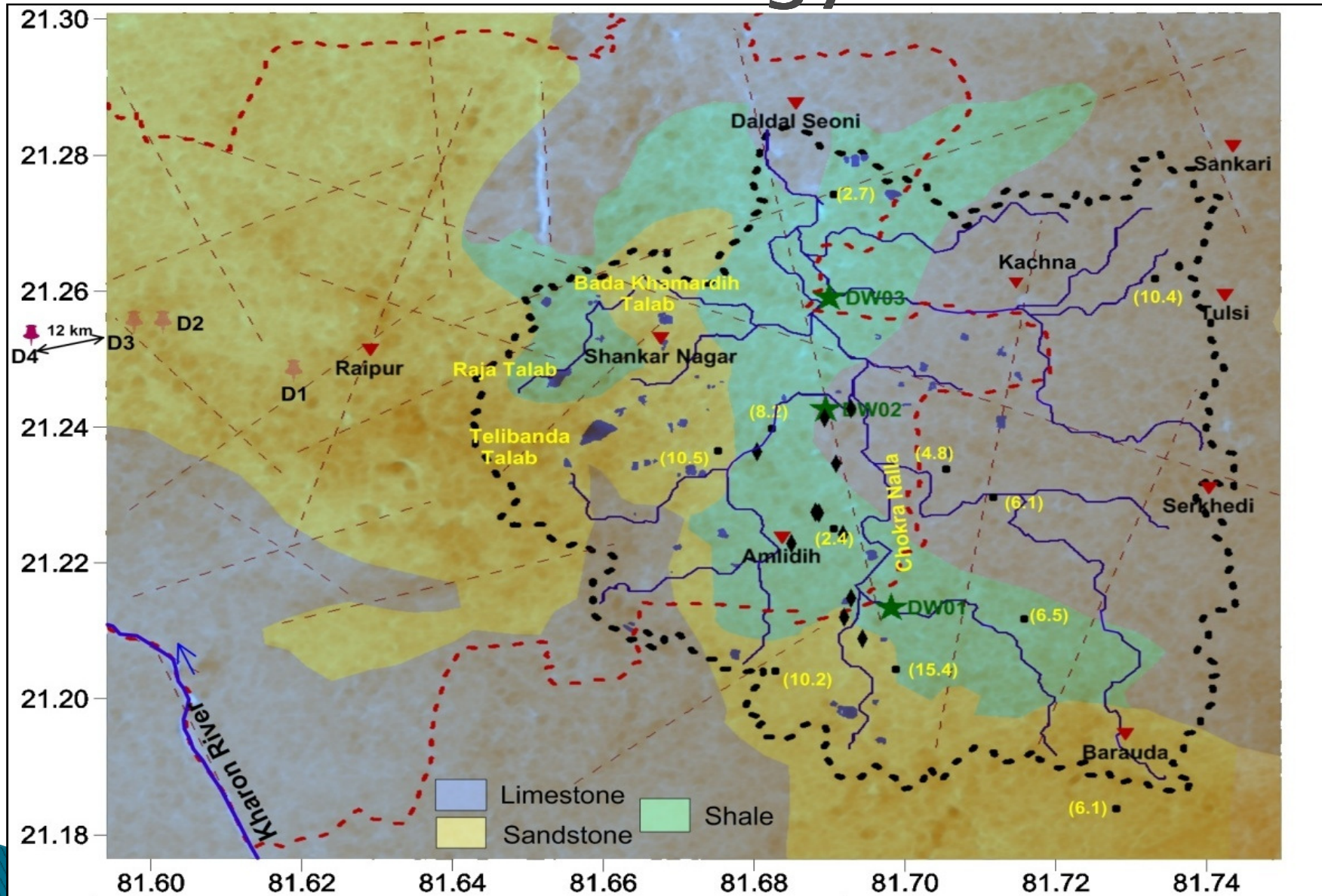
Verification and
evaluation of data

Preparing 3D aquifer
picture

Site characterisation



Geology

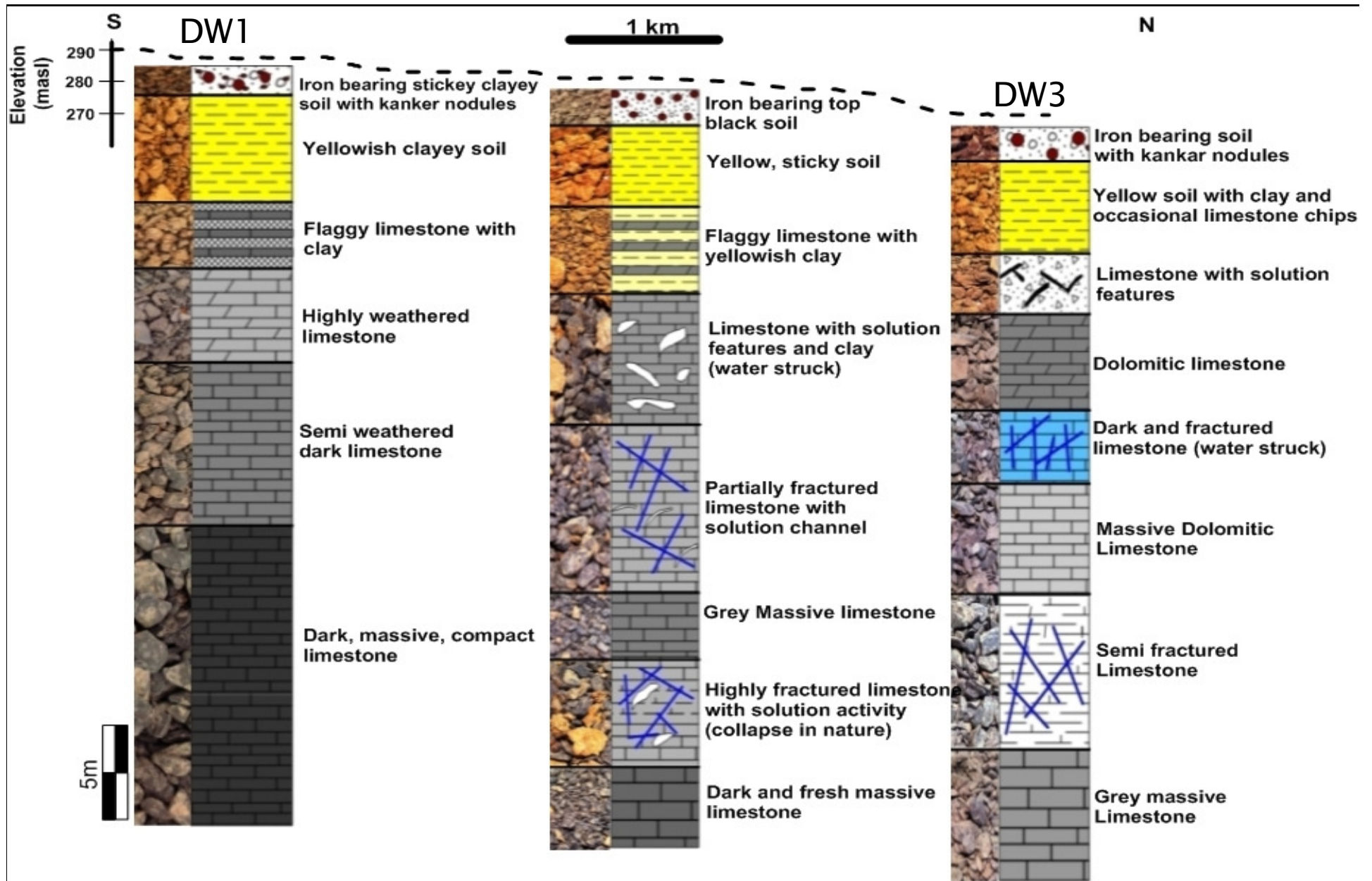


Legend

★ Litholog	★ Dyke	~ Drainage	⋯ Watershed
◆ VES	● Talab	- - Fracture	● Well (6)



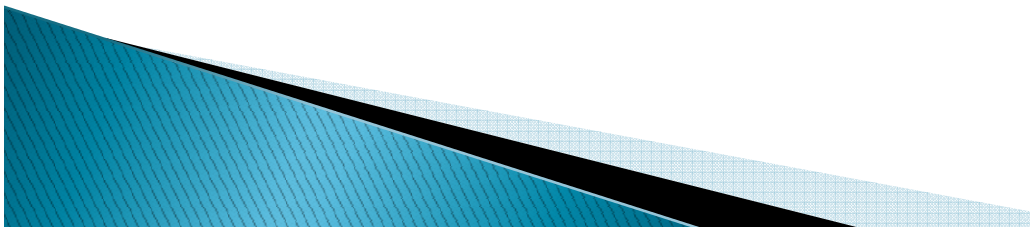
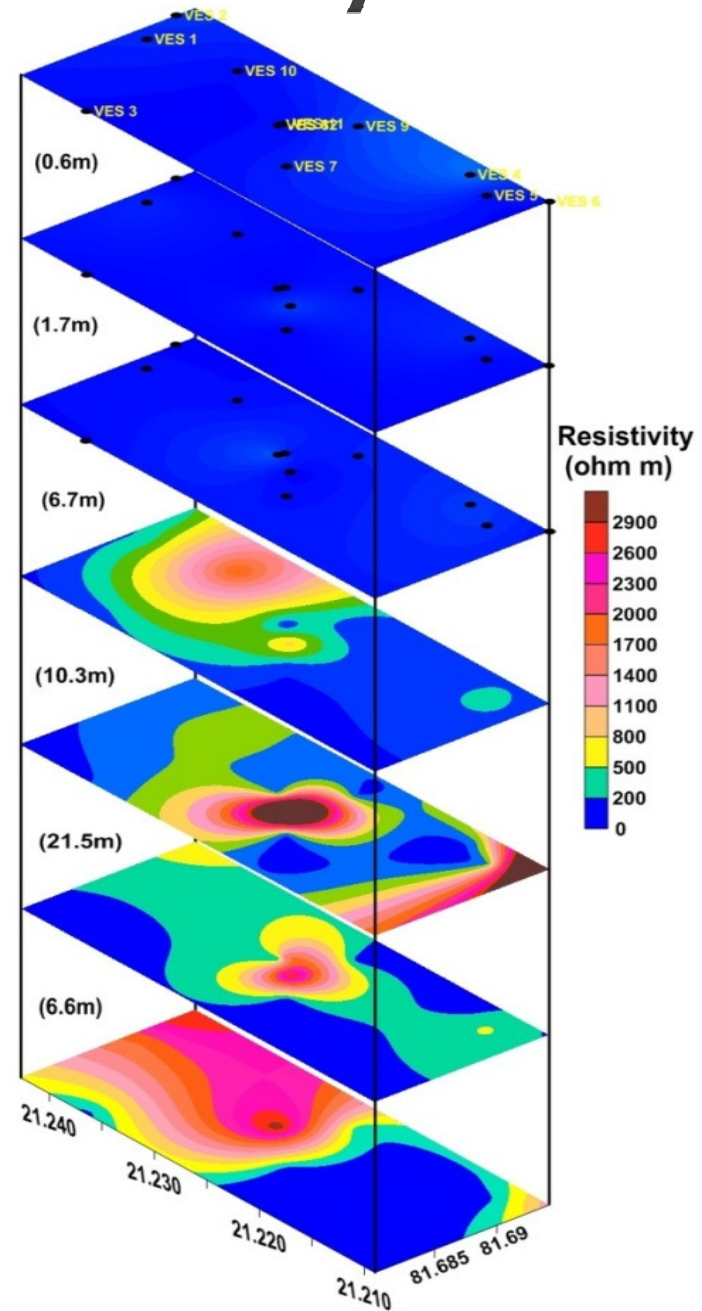
Lithologs



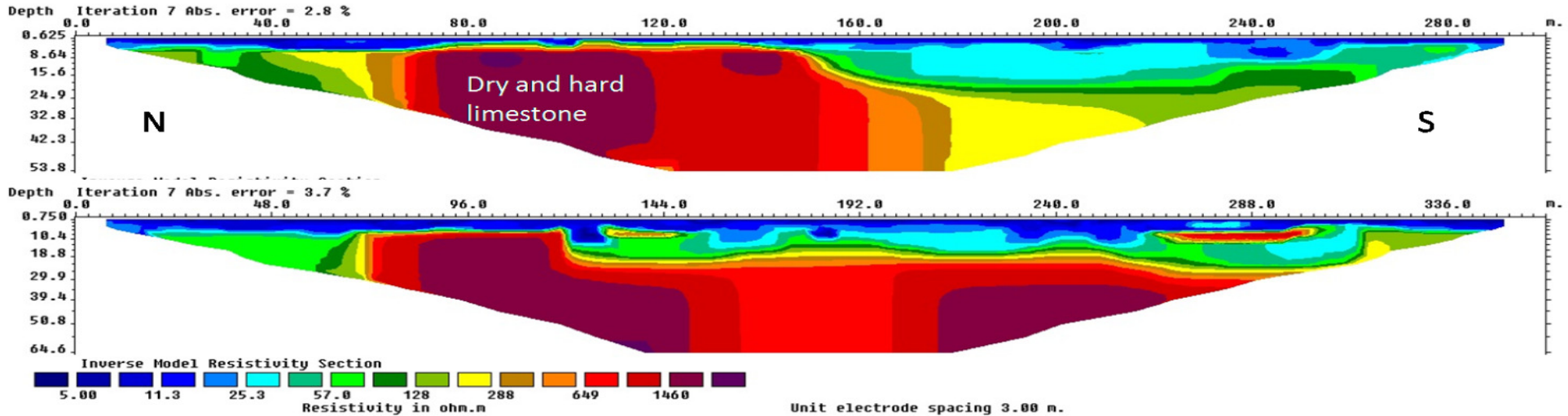
Geophysical Study

Vertical Electrical Sounding

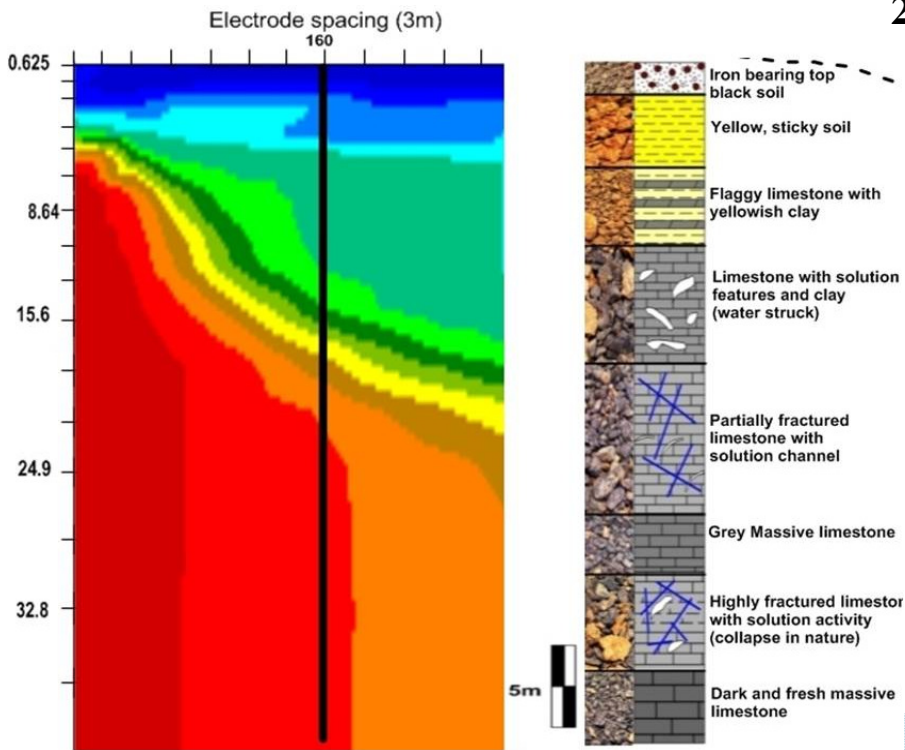
Layer wise section of resistivity layers generated from Vertical electrical soundings carried out at 12 locations.



Verification and evaluation of data

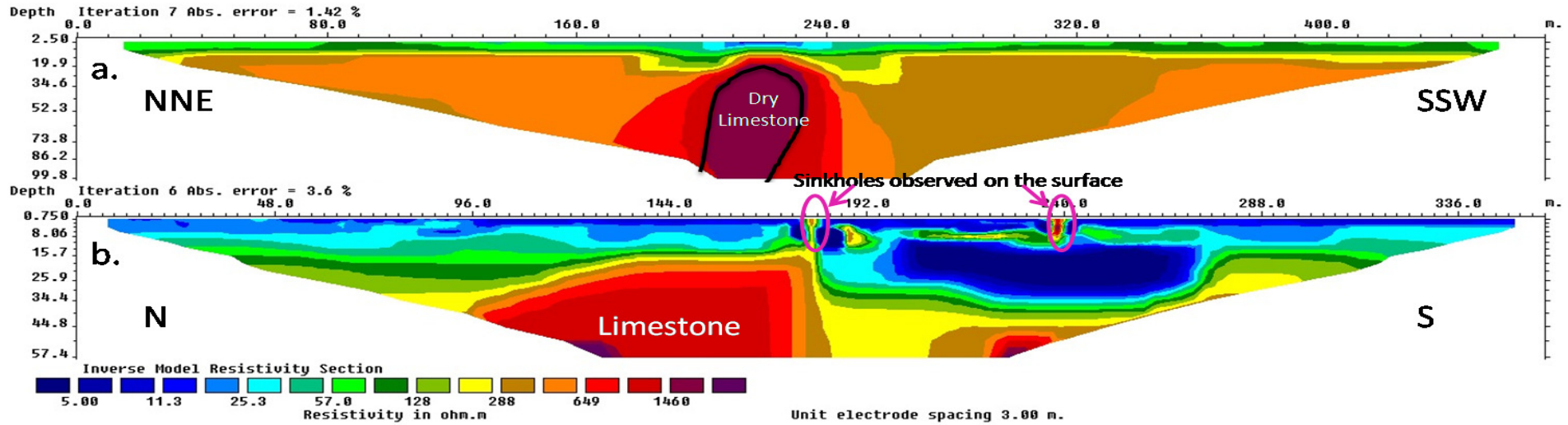


2D-ERT along the profile at station E16 and E7.

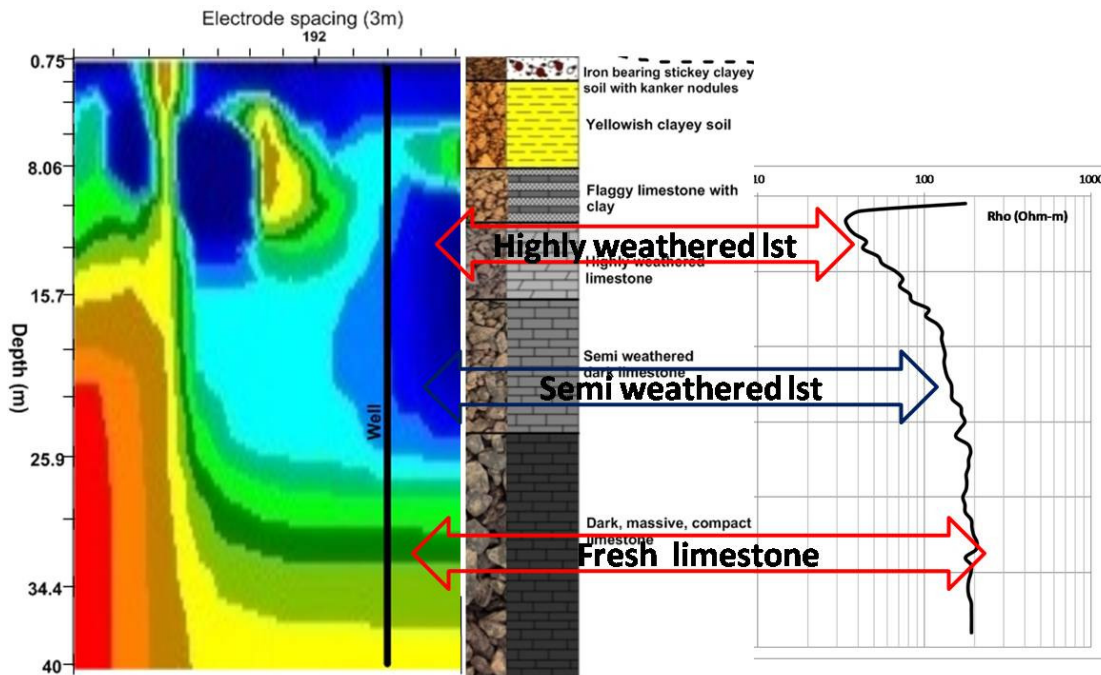


**Correlation of 2D ERT drilled information DW02.
 Well collapse; no logging possible**

Geophysical Study



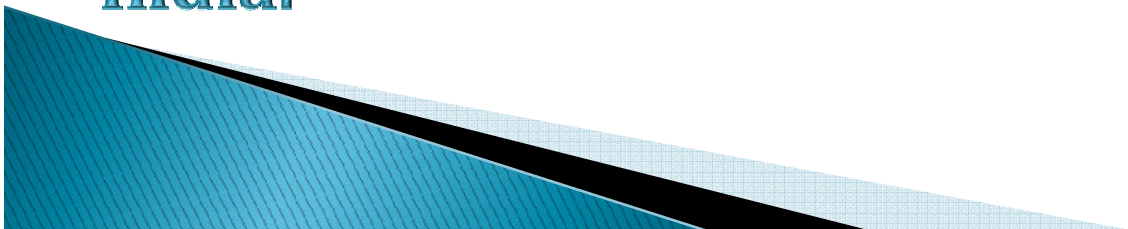
2D-ERT along the profile at station E1 and E2.



Correlation of 2D ERT drilled information DW01.

Conclusion

- **limestone area is feasible for managed aquifer recharge and the presence of surface features like, less slope ($<5^{\circ}$), presence of fractures, karst features, etc will increase the rate of groundwater infiltration.**
- The karst surface dissolution features make it highly conductive to groundwater flow and carry the infiltrating water directly and rapidly to the aquifer.
- **The results will help to locate the best suitable sites in Chandi limestone for developing managed aquifer recharge structures and to assess their feasibility**
- **Results can be upscale to other carbonate aquifers of India.**





Thank You