



INITIATIVE ON  
NEXUS Gains

# Quantifying the functioning of recharge ponds in the Ramganga basin

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Latitude: 28.615088  
Longitude: 78.858915  
Elevation: 229.13±4 m  
Accuracy: 3.5 m

Latitude: 28.714567  
Longitude: 79.088086  
Elevation: 345.21±5 m  
Accuracy: 3.0 m  
Time: 07-24-2023 13:03  
Note: singni  
Powered by NoteCam

Latitude: 28.716124  
Longitude: 78.839893  
Elevation: 219.68±4 m  
Accuracy: 2.8 m

Latitude: 28.526651  
Longitude: 78.705553  
Elevation: 186.38±13 m



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Field visit and stakeholder meeting

Sites selection

Stage-volume survey

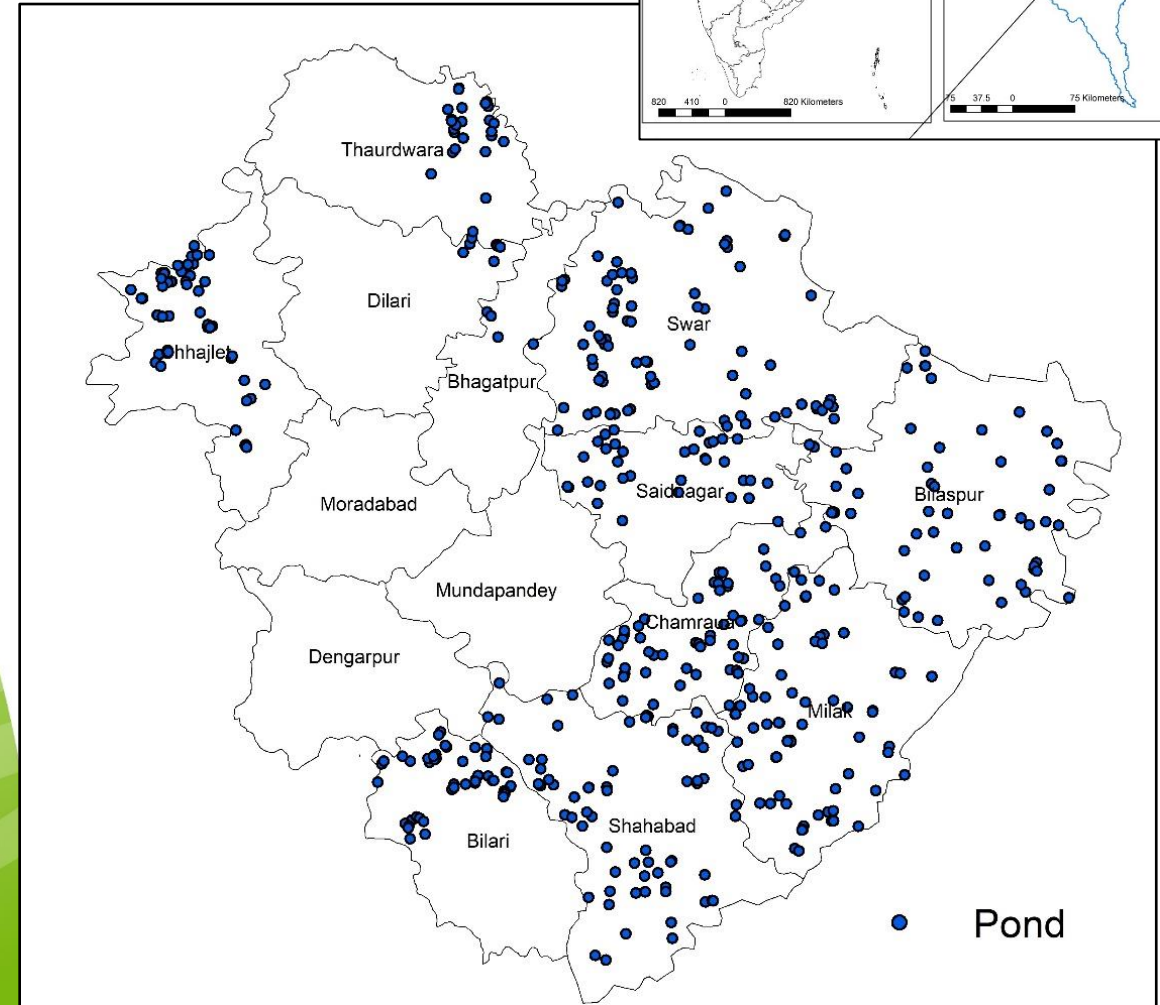
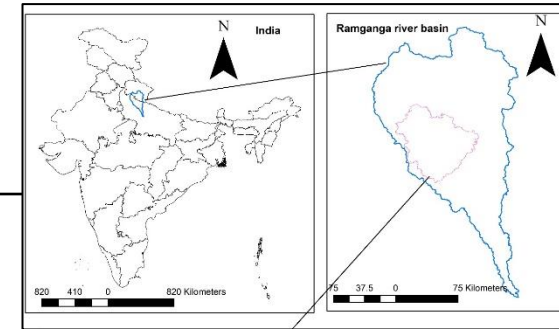
Installation of staff gauge

Pond water level monitoring



# Characterizing recharge from range of sites

- 1000's of ponds and other storage structures in Ramganga basin
- Need for characterizing recharge from existing structures
- Provide a clear understanding of modifications and investment needed in terms operationalizing UTFI at the basin scale
- Aim is to monitor potential recharge using mix of traditional monitoring and citizen science methods for a wider type of recharger sites
- Rampur and Moradabad selected based on stakeholder discussion and building on previous work





# District level stakeholder engagement

## District Level Representative

District Magistrate (DM)

Chief Development Officer (CDO)



## Block Level Representative

Block Development Officer (BDO)

Assistant Development Officer (ADO)



## Village Level Representative

Village Secretary

Village Head

# Stakeholder engagement and field work

- Data gathering and Interviews in two districts (Moradabad and Rampur ) with:
  - Assistant engineer
  - Village development officer
  - Block development officer
  - District development officer
  - Village heads and villagers
- Field visit and systematic data collection of >100 sites



Latitude: 28.929679  
Longitude: 78.680052  
Elevation: 246.24±4 m



Latitude: 28.951753  
Longitude: 78.656899  
Elevation: 243.47±5 m



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# Prioritization of monitoring sites

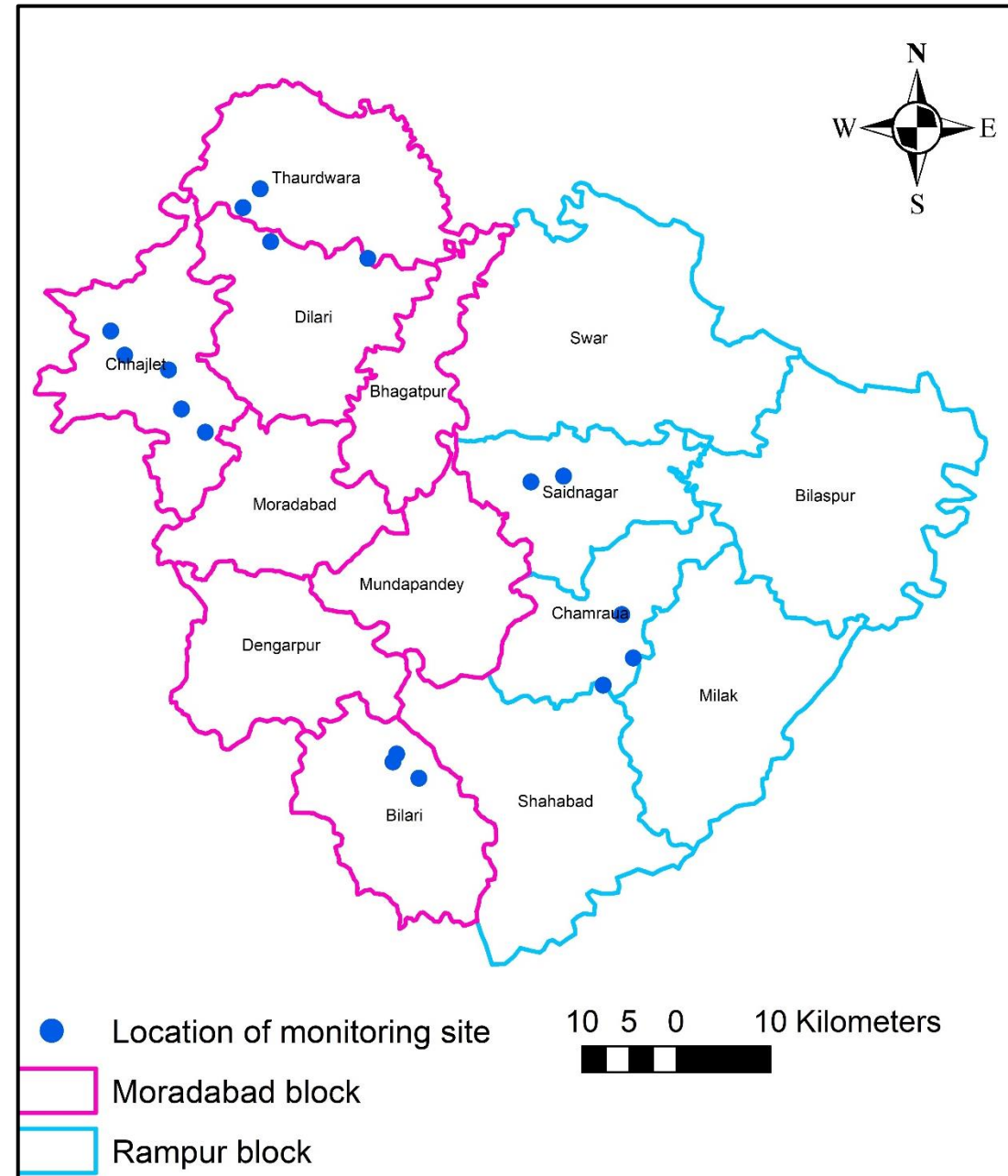


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Criteria	Low suitability	Medium suitability	High suitability
Area of pond	< 0.1 Ha	<0.5	>0.5
Distance from pond to canal	2 to 5 km	500 m to 2 km	within 500 m
Evidence of pollution	Yes (>50HHWW)	Half Pollution (<50HH) + Runoff from adjoining area	No
Water source for recharge	Only household wastewater (HHWW)	Canal + HHWW+ Runoff from the adjoining area	Canal water / Runoff from the adjoining area
Present use of pond	Fish/Water Chestnut	Dumping household waste and Animal dung	Not in use
Pond ownership	Private	Legal owner from Panchayat	Government
Site accessibility	Farm bunds are the way to reach the pond	Easy to access by unpaved road	Next to road/Easy to access by paved roads
Interest of villagers	Low	Medium	High
Interest of the village Head	Low	Medium	High

# Selection of monitoring sites

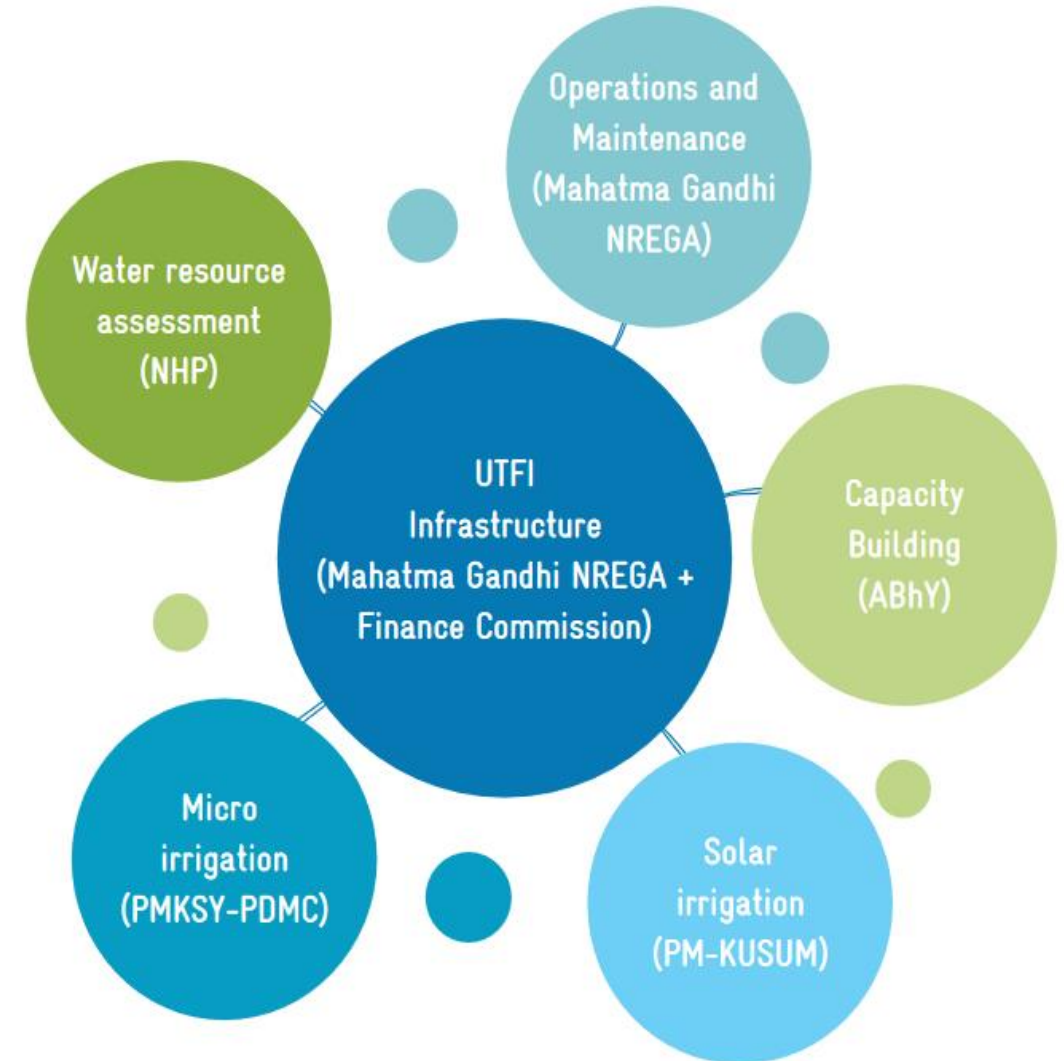
- 15 of sites with different characteristics selected (10 repurposed for recharge and 5 control)
  - Ponds repurposed for recharge by the district administration and years of operations.
  - Control ponds which are not used for recharge.
- Ponds with varying groundwater levels
- Feasibility of monitoring (physical and social)





# Upscaling UTFI: Convergence of schemes

- ✓ Review of ongoing government schemes
- ✓ National and state level stakeholder engagement process.
- ✓ UTFI convergence with existing government schemes.





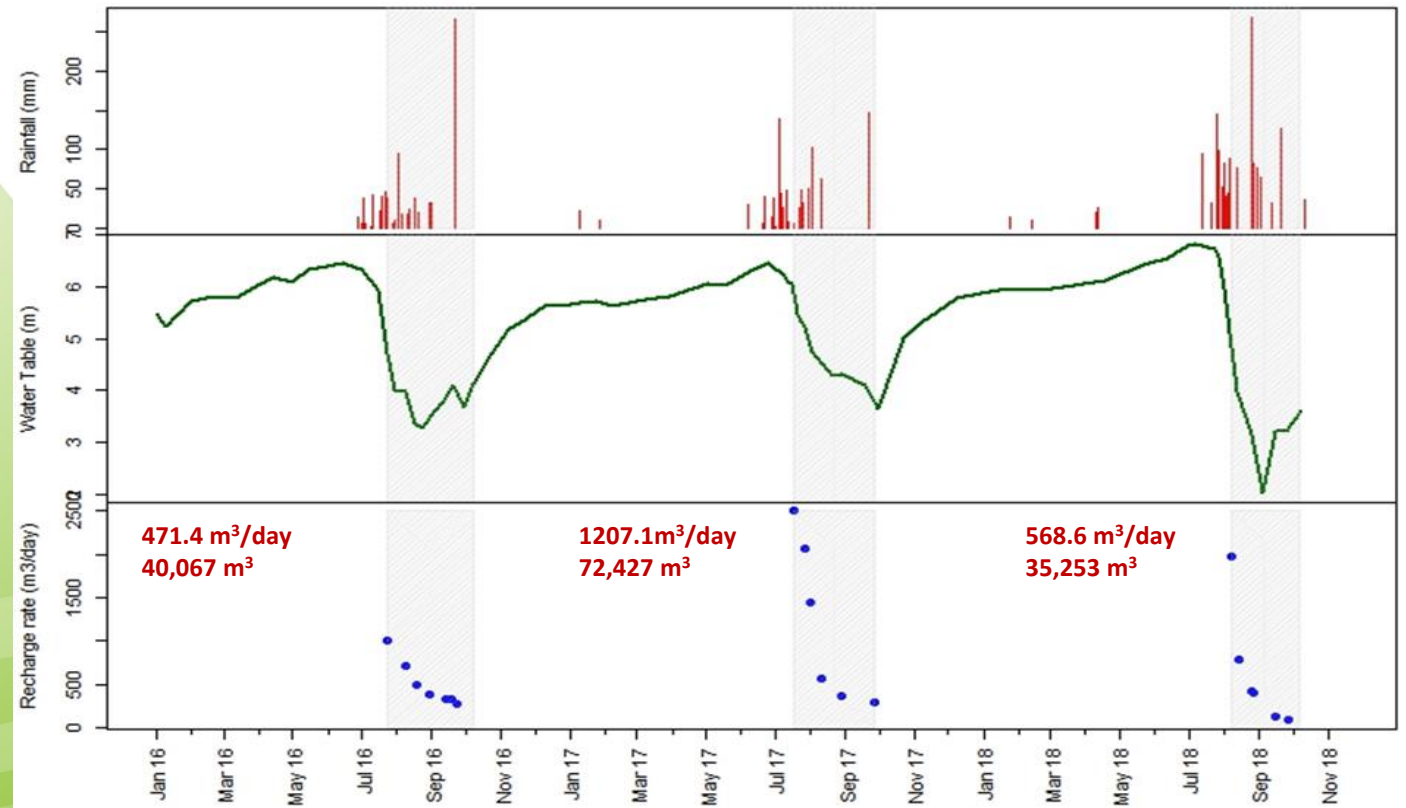
# Recharge from ponds: Results from UTFI Pilot 2017-2019

- Jiwai village, Rampur district of Uttar Pradesh, India
- 10 gravity recharge wells of 150 mm in diameter
- Constructed in the unused village pond.
- Intensive monitoring
  - Staff gauges on modified recharge ponds
  - 7 piezometers
  - Infiltrations tests
  - Canal levels



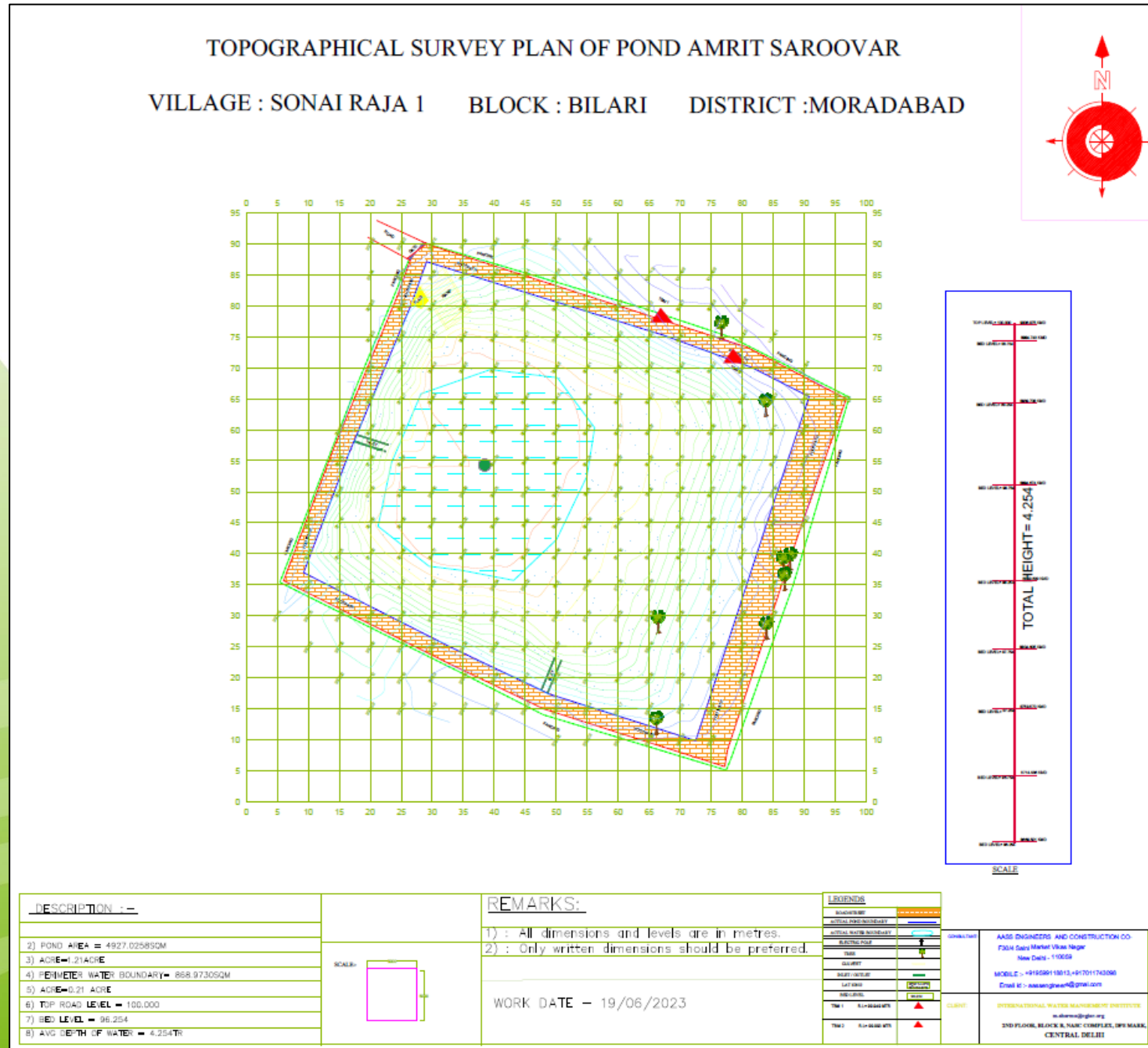
# Results from UTFI Pilot 2017-2019

- Recharged water: 35000- 72000 m<sup>3</sup>/year
  - Enough to irrigate ~ 15 ha of crop land
  - 6.7 – 13.7 times the storage capacity of pond.
  - recharge wells increased recharge by a factor 9 – 17.7 times
- High intra and inter-year variability



# Sites and methods

- Mix of direct and indirect methods
- Getting storage and storage-volume curves of the selected sites



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# Sites and methods

- Getting storage and storage-volume curves of the selected sites
- Installation of staff gauges in the selected sites

17<sup>th</sup> June, 2023



10<sup>th</sup> July, 2023



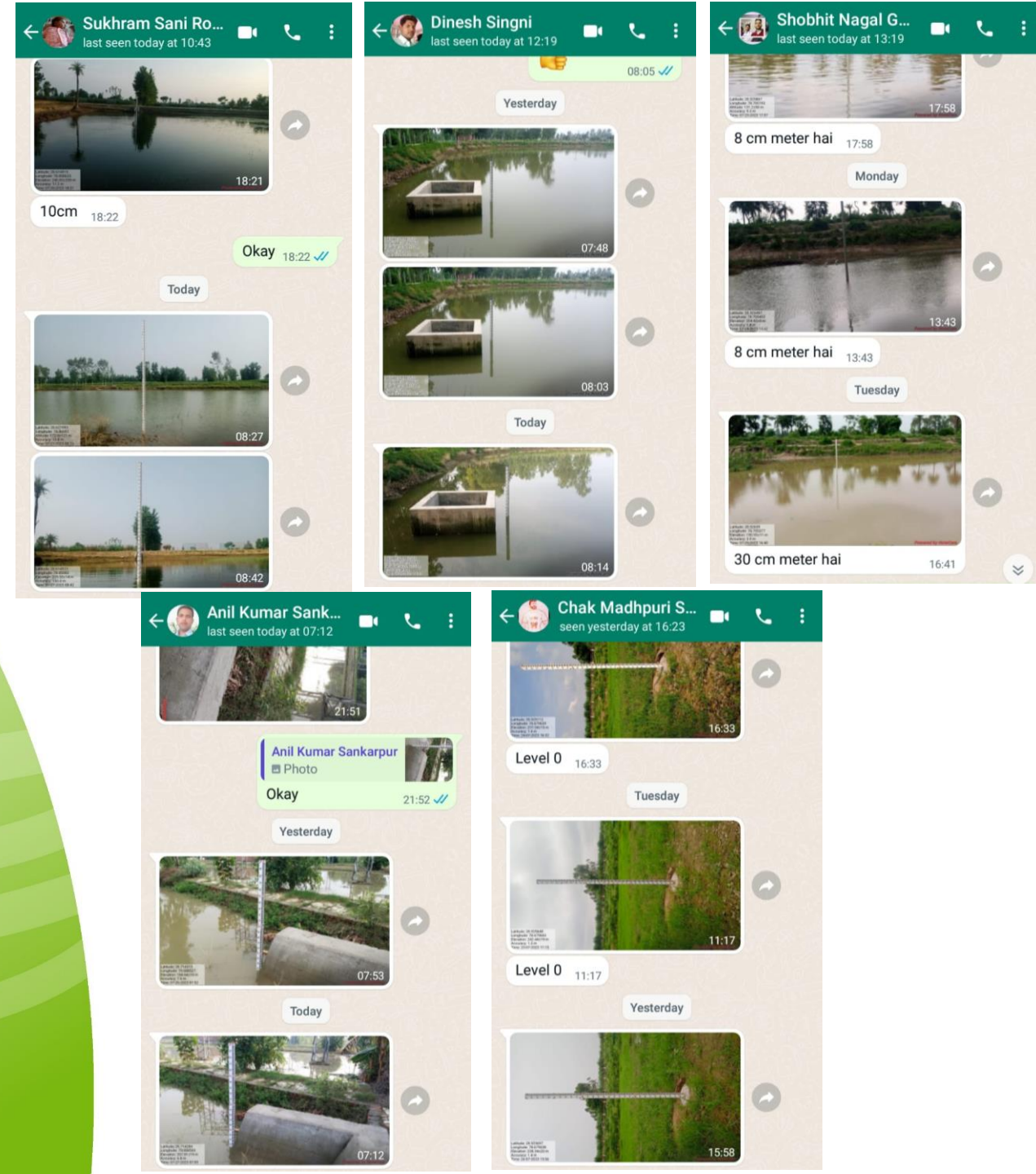
24<sup>th</sup> July, 2023



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# Sites and methods

- Getting storage and storage-volume curves of the selected sites
- Installation of staff gauges in the selected sites
- Local citizens for monitoring



Thank you

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