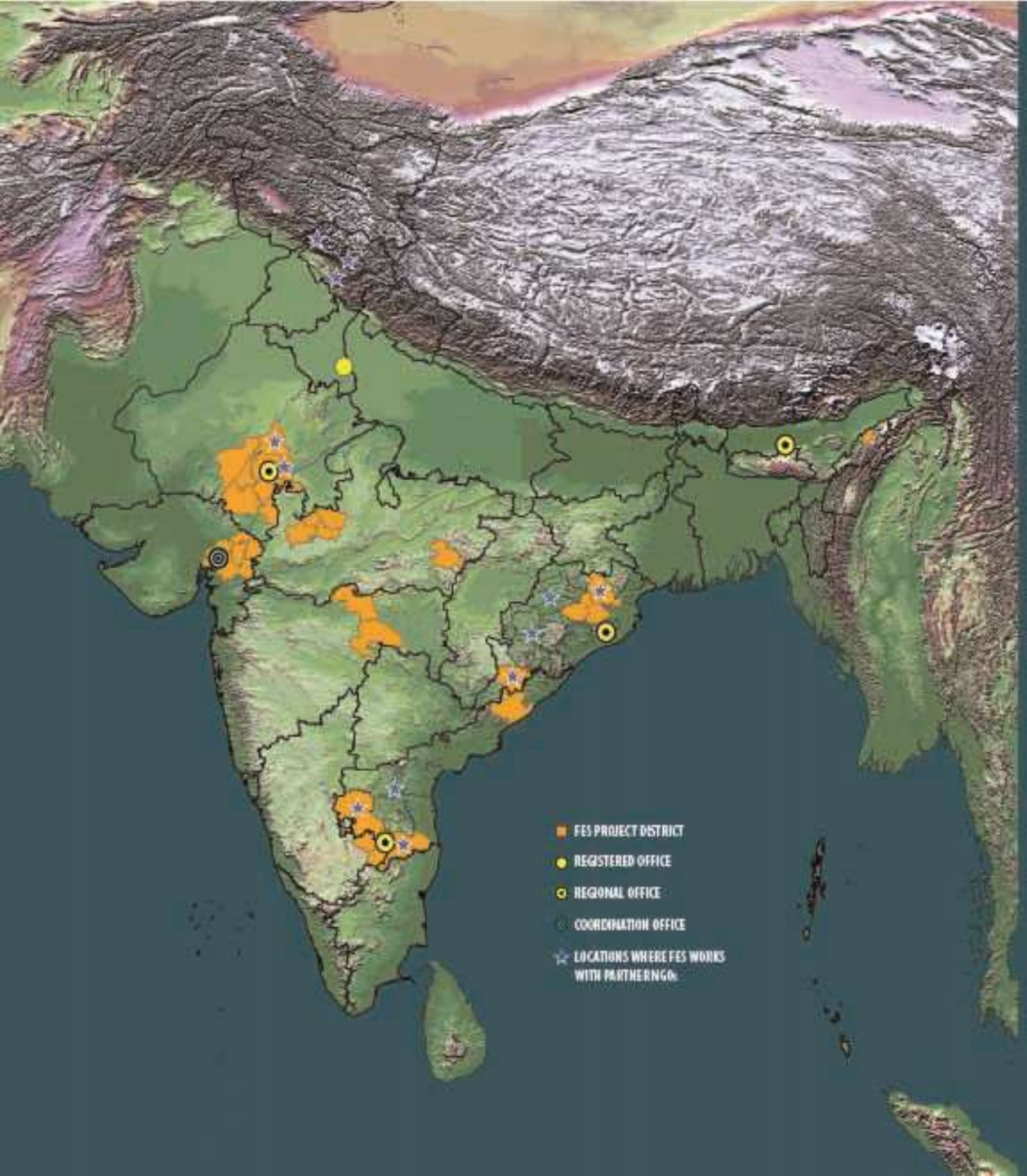

FES
FOUNDATION FOR ECOLOGICAL SECURITY

Our Mission

Conserving nature and natural resources, village commons in particular, to enhance economic opportunities in rural India



Our Presence

FES activities are spread across **116** districts in **11** states of India, covering 11 agro-ecological zones of the country.

12.52 million acres of common land brought under community management

41,880 habitations assisted in restoring and managing their Commons

24.8 million people impacted

Secure
Land Rights

+

Empower
Local Governance

+

Restore Degraded
Ecosystems

=

+

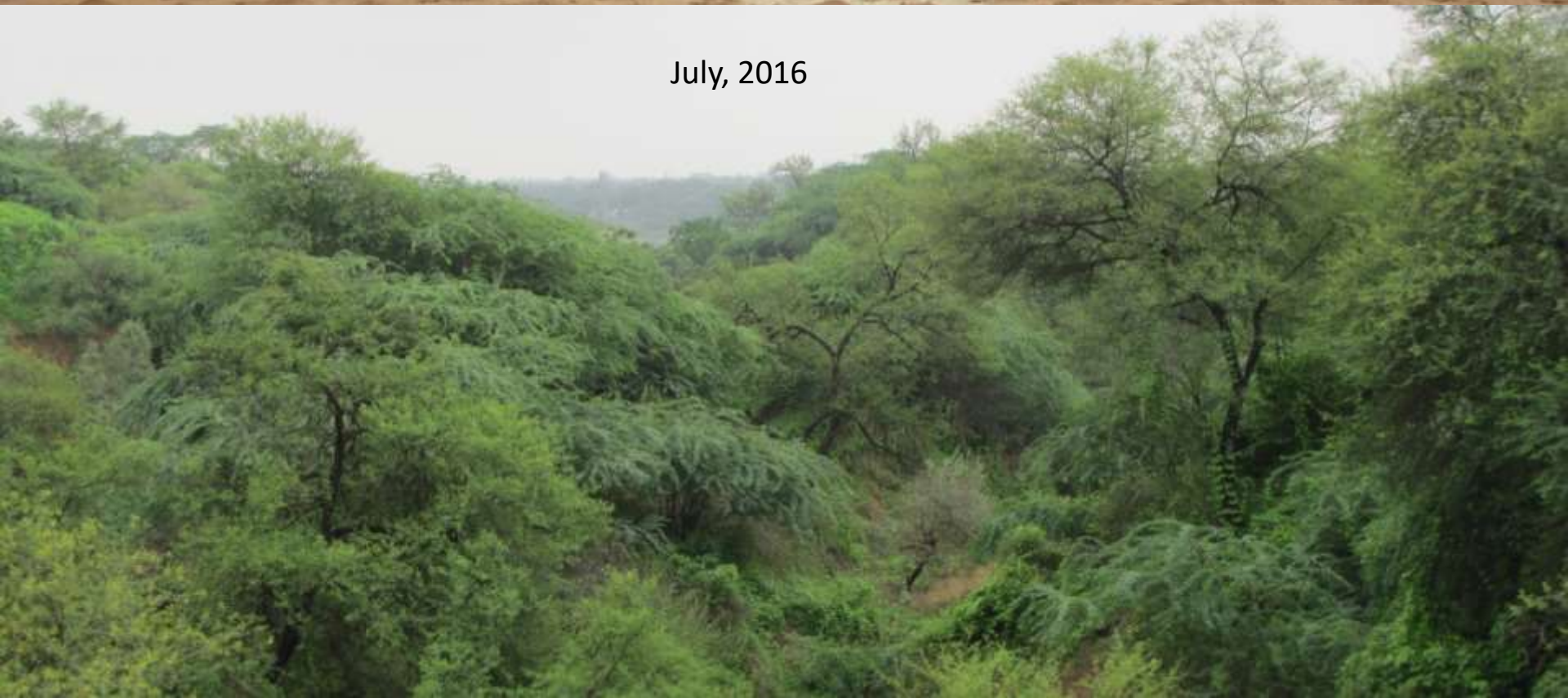
Ecological
Health

Resilient
Livelihoods

Sarnal, Gujarat

July, 1986

July, 2016



Sajjupalli, Karnataka

August 2004

October 2017

India Observatory BETA

India Observatory

Gaps addressed by IO in Current Developmental Practices

- Most of the data initiatives disregard nature and natural processes, *IO could position itself to advance the mission of Ecological Security and Livelihood Security*
- While there are several data sets, analytics and algorithms available, the ‘last mile’ gap in access and application is missing, *IO bridges this last mile gap.*
- Much of the development practice is sectoral, inter-disciplinary integration is missing, resulting in subpar outcomes and sometimes working at cross purposes*. IO encourages interdisciplinary thought process.*

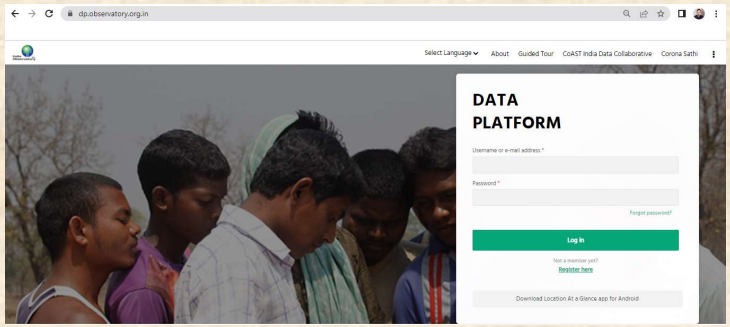
Without being an ‘everything for everyone,’ the IO can play a central and prime role in preserving the Ecological Security of India.

Has the potential to become the social network on matters pertaining to ecology, environment and linkages between environment and poverty.

India Observatory components

Indian Biodiversity Information System

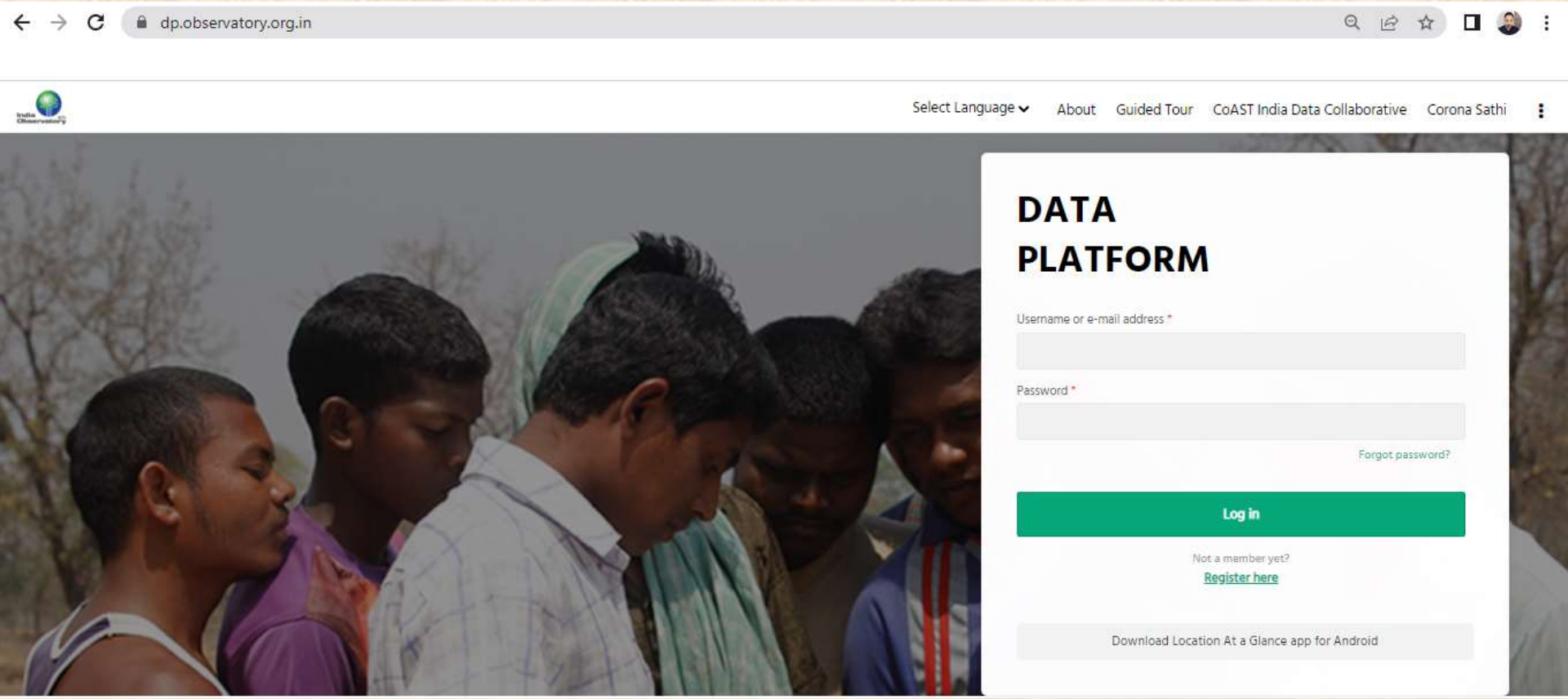
Data Platform



Tools/Applications

Data Platform

https://dp.observatory.org.in



India Observatory Database

Socio-Economic

Spatial data:

Administrative Divisions (state, district, tehsil, village),1991,2001 & 2011

Digital chart of the world

- River basins, Bio-geographic regions
- ASTER, SRTM & Gtopo30 (Digital Elevation)
- Agro-eco regions
- Protected areas (IUCN 2012)
- Forest cover (1990-2011)
- Wasteland (1995, 2005 & 2010)
- CGWB Watershed Atlas

Non-spatial data:

- Census data 1991 & 2001 (around 300+ attributes)
- Time series data for Project States (1951-2007)
- Market potential Areas (2001 & 2008)
- Groundwater data (2004)
- Forest cover from 1990 – 2011

Ecological

Remote Sensing:

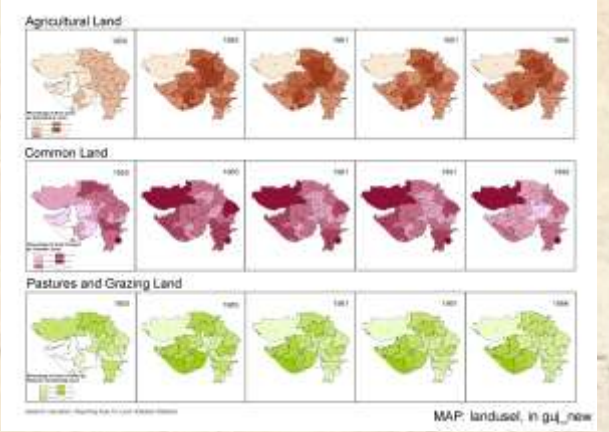
- Vegetation Indices NDVI/EVI From 2000 onwards
  - Leaf Area Index
  - Gross Primary Productivity
  - Thermal Anomalies & Fire
  - Land Cover Type Yearly
  - Vegetation Continuous Fields
  - GRACE TELLUS Landmass Dataset
  - Climatology Data (CRU TS 3.20, 1901 to 2011, Monthly Average of Temperature(Min,Max,Mean), PET, WET Days etc.

Other Datasets

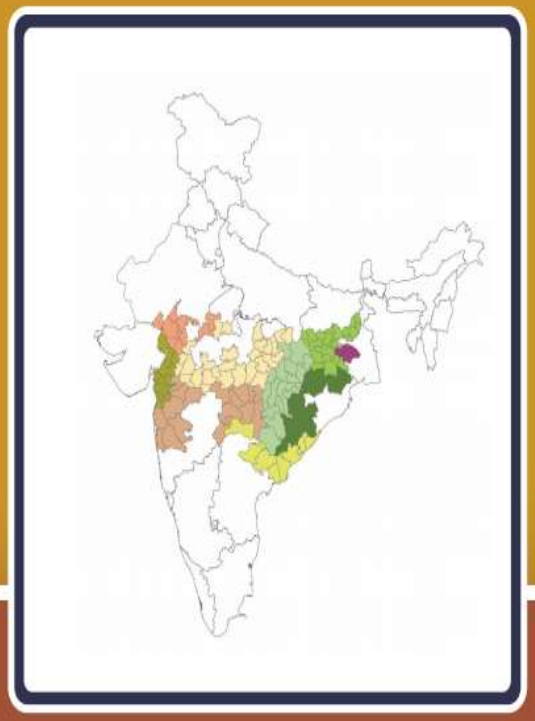
- Other Census like Agriculture, Livestock, Irrigation etc.
- Harmonized World Soil Database
- Global Aridity and PET Database
- Bio-geographic & Agro-ecological regions
- Expert Range Maps

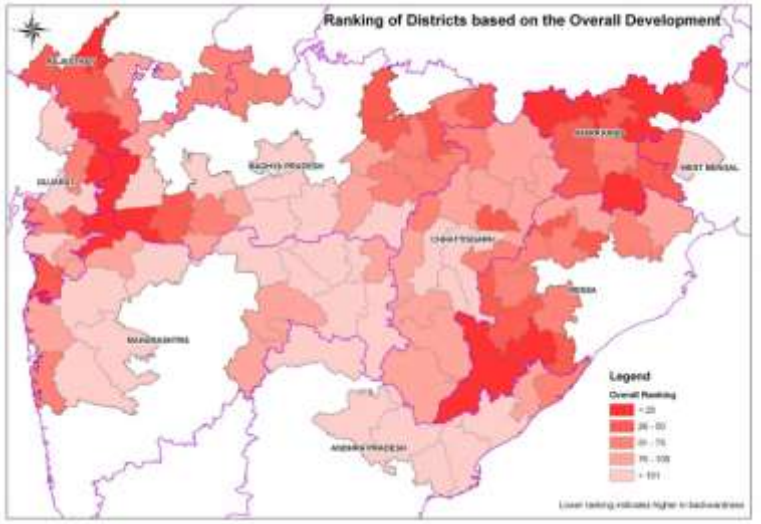
Biodiversity

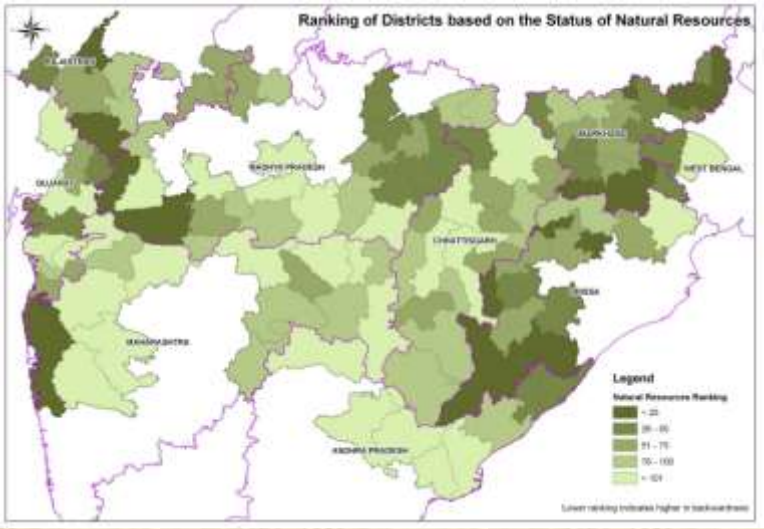
- Approximate 30,000 Taxa of Birds, Mammals, Reptiles, Amphibians, Spiders and Angiosperm Flora
- Diverse Database
  - Bibliography
  - Books
  - Images and Multimedia
  - Museum Collection
  - Sighting Database
- GIS Based distribution and sighting maps



ATLAS OF CENTRAL INDIA

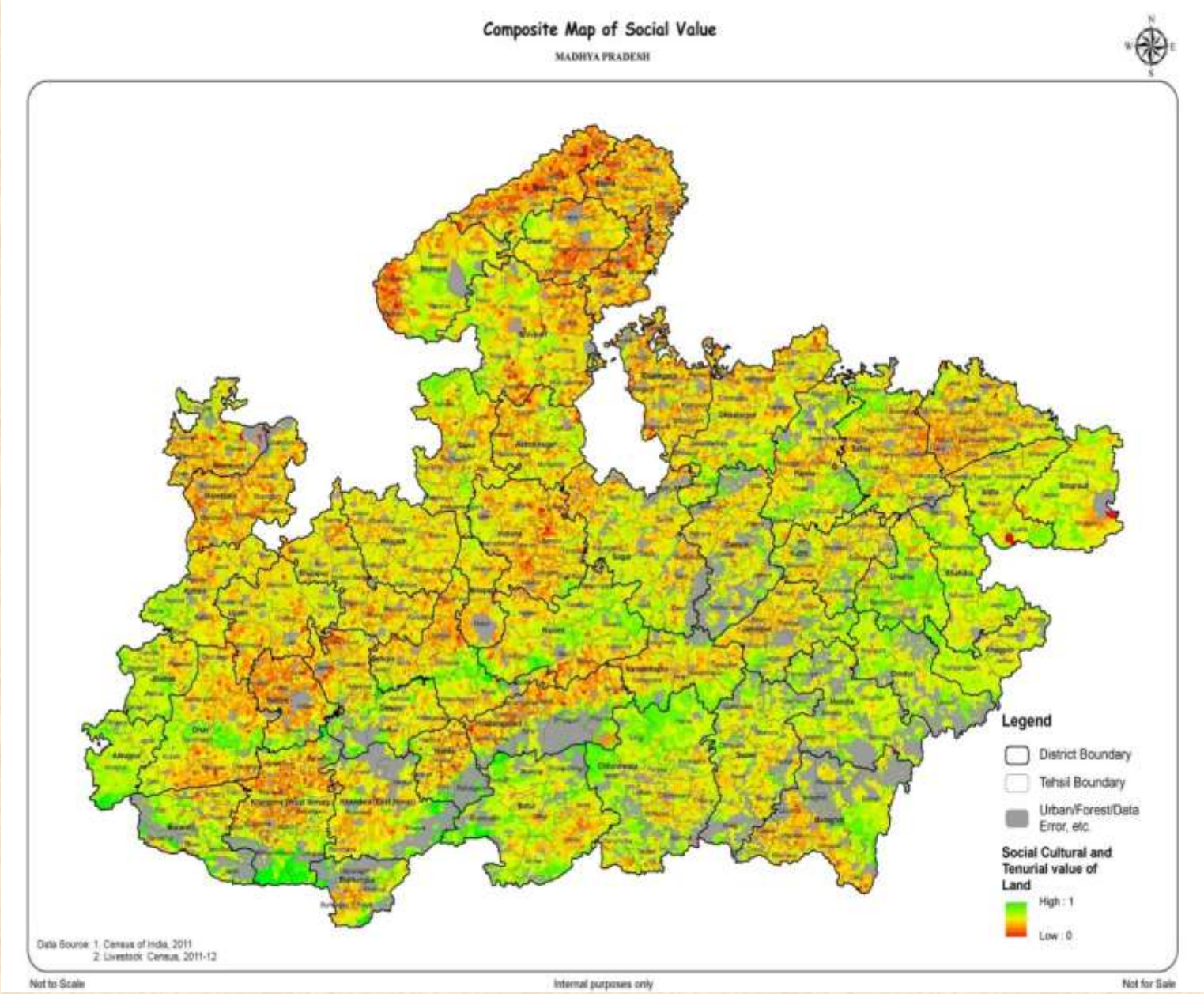






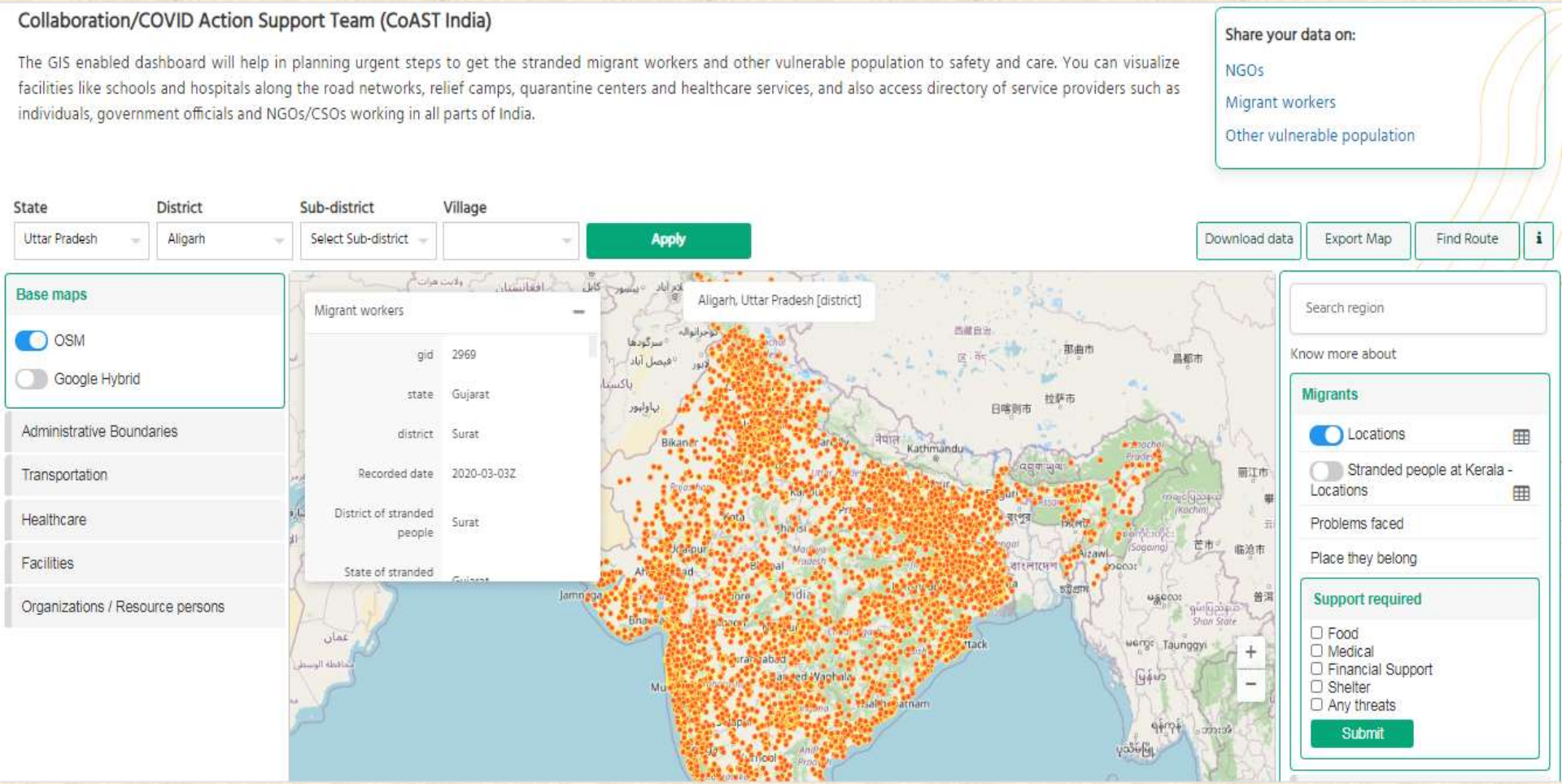
Knowledge Bank for 130 tribal districts of Central India to support with livelihood based projects (supported by **CINI**)

Ranking of districts based on: Ecological profile, Demography, Infrastructure, Education, Health, Agriculture & Livestock, Economic status, Natural resources



Spatial mapping of the social, cultural and economic values associated with Commons for informed land use decisions and a more socially & ecologically responsible renewable energy siting

Collaborative/Covid Action Support Team (CoAST)



Connecting help seekers and help providers

- Act as ‘Network of Networks’ as a Clearing House of information
- Jharkhand and Kerala Governments and the range of volunteers, NGOs and Civil societies initiatives

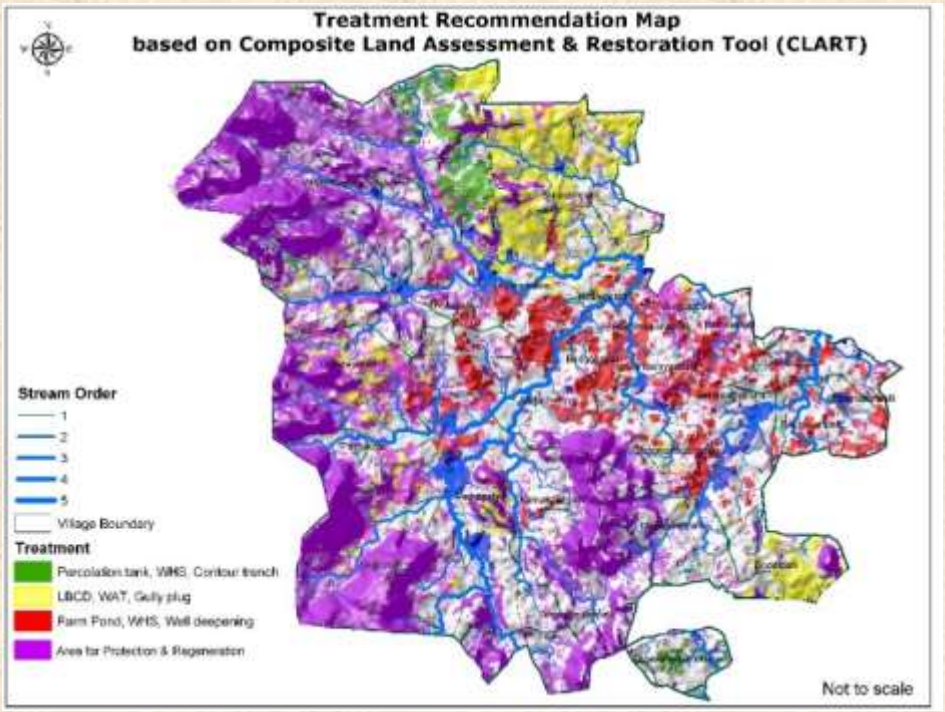
Applications

Parameters	Tools	Planning	Implementation	Monitoring	Evaluation
Water	Composite Landscape Assessment and Restoration Tool (CLART)	✓	✓		
	Crop Water Budgeting (CWB)	✓			
	Experimental Game (EG)	✓			
	Ground Water monitoring Tool	✓	✓	✓	
Common Land & Forest Restoration	Common Land Mapping Tool	✓	✓	✓	✓
	Normalized Difference Vegetation Index (NDVI) analysis Tool	✓		✓	
	Species Distribution Model (SDM)	✓	✓	✓	
	Integrated Forest Management Toolbox (IFMT)	✓	✓	✓	✓
	Forest Right Act Tool (FRA)	✓	✓	✓	
Livelihoods & Entitlement	GIS Enabled Entitlement Tracking (GEET)	✓	✓	✓	✓
Data Support	Primary data collection tool (Household surveys, MIS etc.)	✓	✓	✓	✓
	Data platform (Socio economic, ecological and environmental data from different sources)	✓	✓	✓	✓

Composite Landscape Assessment & Restoration Tool (CLART)

Planning tool that aids in data based soil and water conservation restoration measures

- Measures, design and cost estimates for water conservation (surface and subsurface storage)
- Offline, colour coded for semi-literate, reduced role of engineers



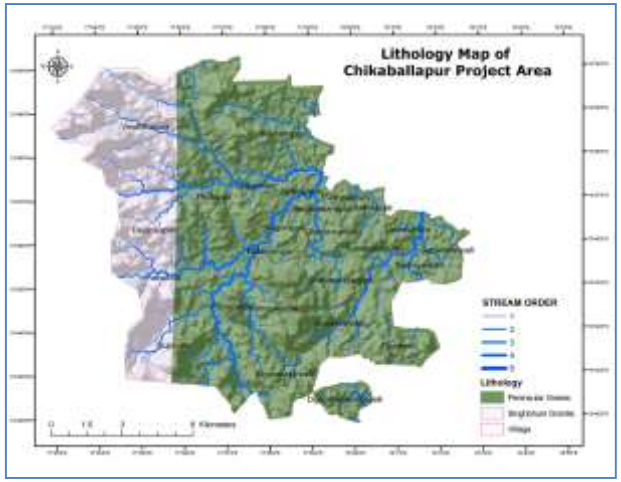
- MoUs executed with Govt of Chhattisgarh, Govt of Andhra Pradesh, Govt of Karnataka, Govt of Odisha, NIRDPR + 55 Partner NGO's
- Water level campaigns for improving accuracy through refined aquifer mapping – 322 blocks

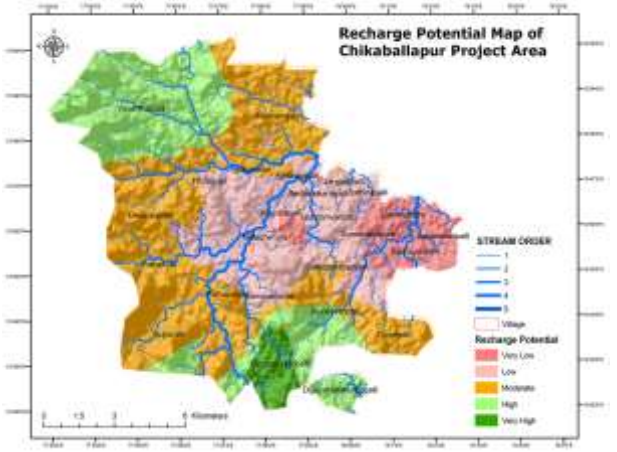
Composite Landscape Assessment & Restoration Tool (CLART)

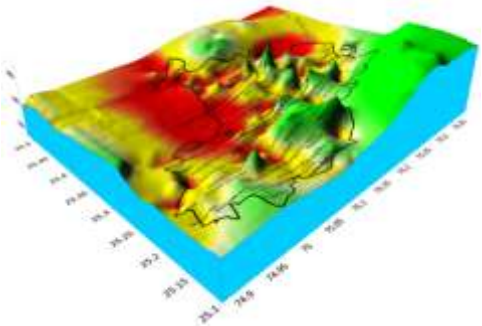
Decision support tool which provides ***location specific*** information in a ***user friendly*** *manner* to ***enable village communities*** to ***plan*** and ***develop estimates*** of the soil and water conservation interventions ***without help of Engineers and Internet at field***

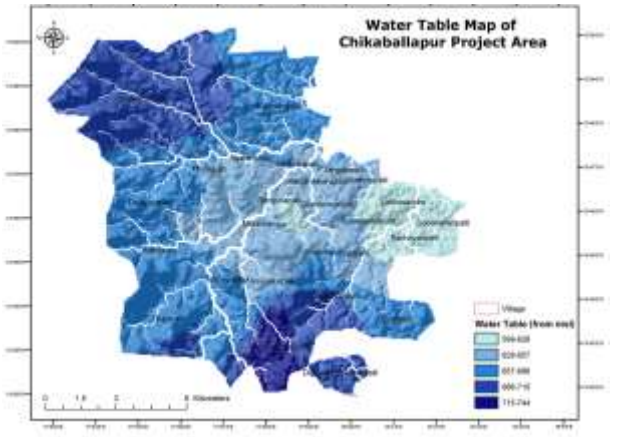
Layers used in CLART

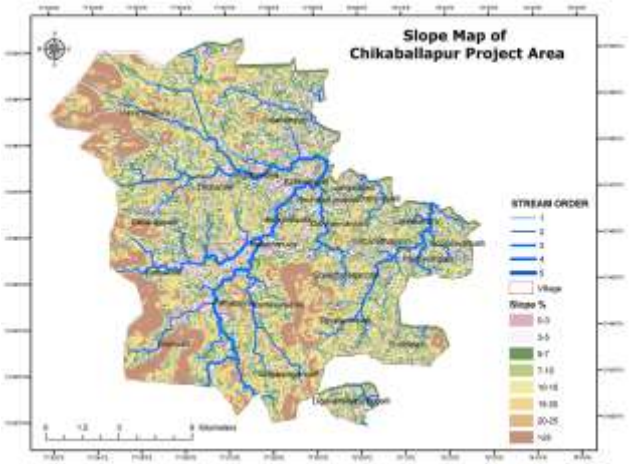
- Drainage
- Well/Spring
- Rainfall
- Geology
- Ground Water level
- Recharge potential
- Slope
- Landuse & Landcover
- Geomorphology
- Watershed
- Lineament
- Village boundary











Treatment plan Preparation based on CLART

Recommended Treatment Code	Recommended Treatment Type	Recharge Potentiality	Slope	Land Use/Land Cover
1	Good Recharge structure (Percolation tank, WHS, CCT etc)	Very High (5) High (4)	3-20%	Current fallow (5), Other Waste land (9), Gullied (10), Scrubland (11)
2	Moderate Recharge structure (WAT, GP, LBCD etc)	Moderate (3)	5-25%	Current fallow (5), Other Waste land (9), Gullied (10), Scrubland (11)
3	Surface water Harvesting structure (WHS, FP, FB etc)	Low (2) Very Low (1)	0-20%	Current fallow (5), Other Waste land (9), Gullied (10), Scrubland (11) Agriculture (2,3,4)
4	Regeneration (Plantation, Veg Int, Grass seeding, stone bunding, bench terracing, trenching etc)	Very Low (1), Low (2), Moderate (3)	25 -30%	Current fallow (5), Other Waste land (9), Gullied (10), Scrubland (11), Mixed, degraded forest, Deciduous forest
5	High Runoff zone (Trenching, stone bunding)	Very Low (1), Low (2), Moderate (3) High (4) Very High (5)	Slope >30	Current fallow (5), Other Waste land (9), Gullied (10), Scrubland (11), Mixed, degraded forest, Deciduous forest

Farm Pond (FP)

Input Sheet A- Basic Details of the Work (Filled for each site)

Location Name of the Site *

Agency *

Select Answer

Purpose of structure *

Select Answer

Input sheet B- Filled in the field

Dimension of Farm Pond (Based on field Survey)

Top Length of Farm Pond in (meter) *

Top Width of Farm Pond in (meter) *

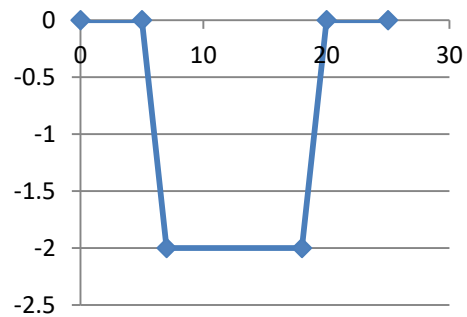
Depth of Farm Pond in (meter) *

SAVE

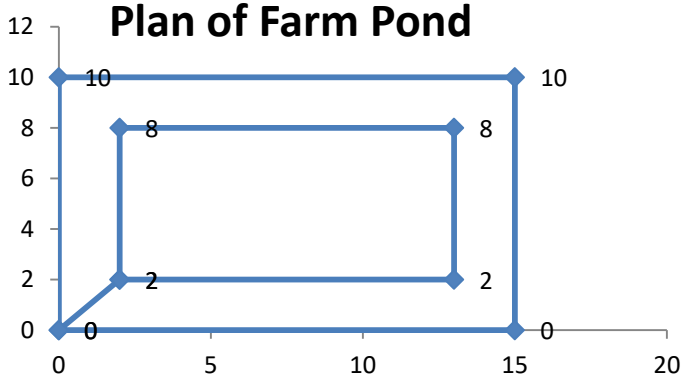
Design Estimate preparation in CLART

Output Sheet B - Cost Estimation Abstract Sheet								
Sr. No.	**Item**	**Quantity of work**	**Unit**	**Unskilled Labour Cost**	**Skilled Labour/ Mate Cost**	**Material Cost**	**Total Cost**	**Total Mandays Generated**
1	Layout marking for farm pond	50	Running Meter	50	25	0	75	0.3
2	Dug belling work up to 5 to 7 cm depth for farm pond	50	Running Meter	100	25	0	125	0.6
3	Excavation of farm pond including initial lead and lift	208						
3a	In soft soil/ordinary soil	41.6	Cubic meter	3328	83	0	3411	18.7
3b	In hard soil	83.2	Cubic meter	8320	166	0	8486	46.7
3c	In murrum	20.8	Cubic meter	2496	62	0	2558	14.0
3d	In hard murrum	41.6	Cubic meter	5824	166	0	5990	32.7
3e	In disintegrated rock	20.8	Cubic meter	4160	104	0	4264	23.4
3f	In hard rock	0	Cubic meter	0	0	0	0	0.0
	Total Cost of farm pond			**24278**	**632**	**0**	**24910**	**136.4**

Cross Section of Farm Pond

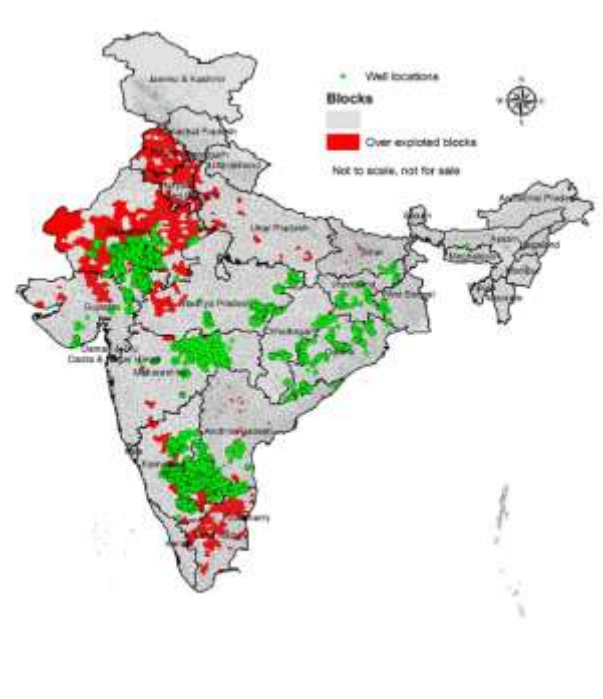


Plan of Farm Pond



Ground water monitoring tool (Napo Jal Bachao Kal)

- Complementing CGWB ground water data for better decision making of soil and water conservation
- Building observability of ground water changes across over exploited area
- Modelling of the data for better visualization and action by partners
- Use the data for improving recharge-discharge potential area in CLART



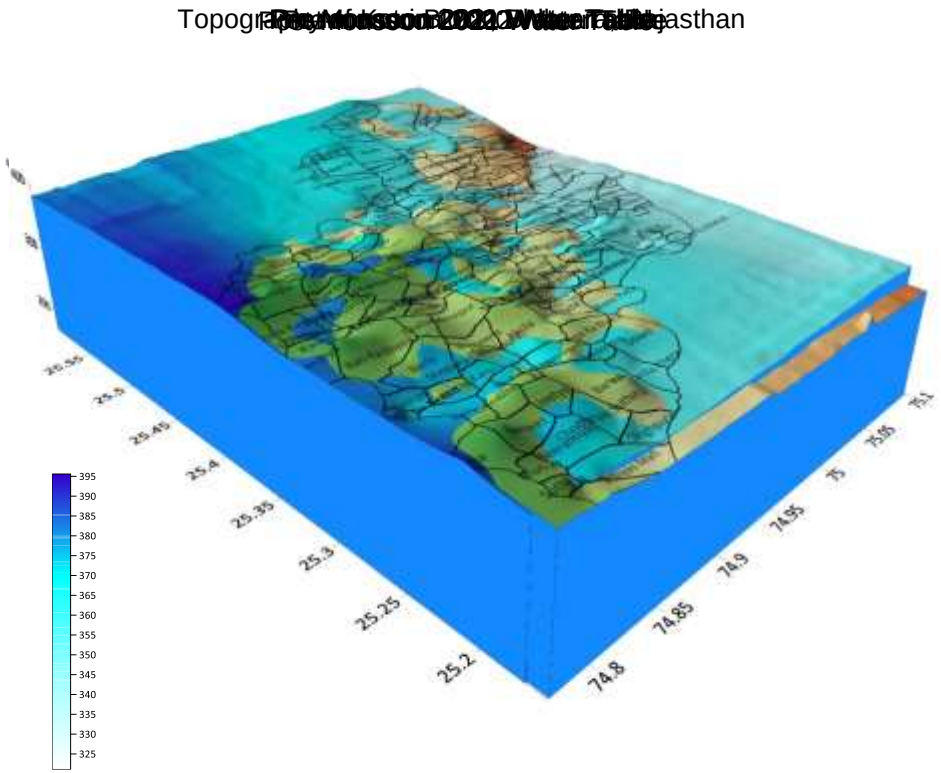
In partnership with INREM and ACWADAM along with 140+ organizations

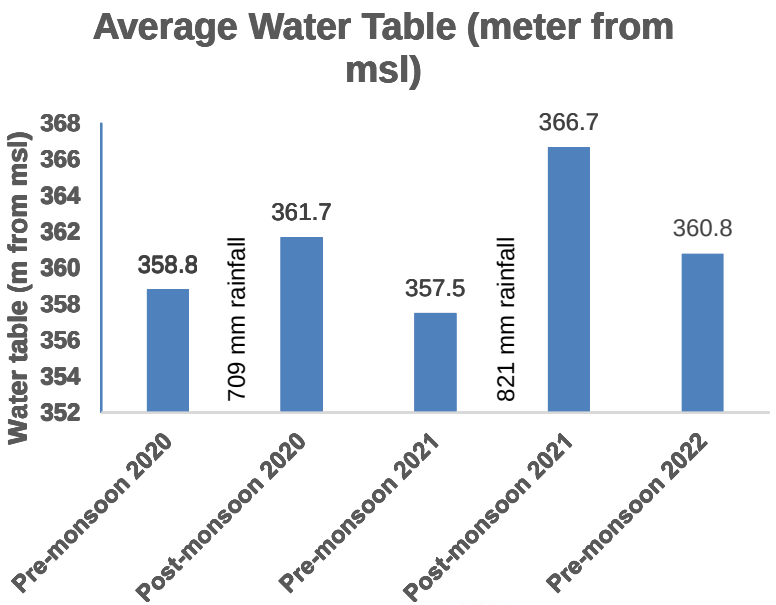
Nearly 35K wells have been monitored in 10K villages

Analytics developed for visualization of the data at block level

Seasons	Wells Monitored	States	Districts	Blocks	Villages
Pre-Monsoon 2020	18,041	12	113	390	5353
Post-Monsoon 2020	20,733	16	141	376	5272
Pre-Monsoon 2021	34,698	12	97	485	9803
Post-Monsoon 2021	32,247	12	87	514	9465
Pre-Monsoon 2022	40,385	12	134	678	10613

3D-Visualization of Ground water scenario using GWMT Data – Kotri Block, Bhilwara, Rajasthan



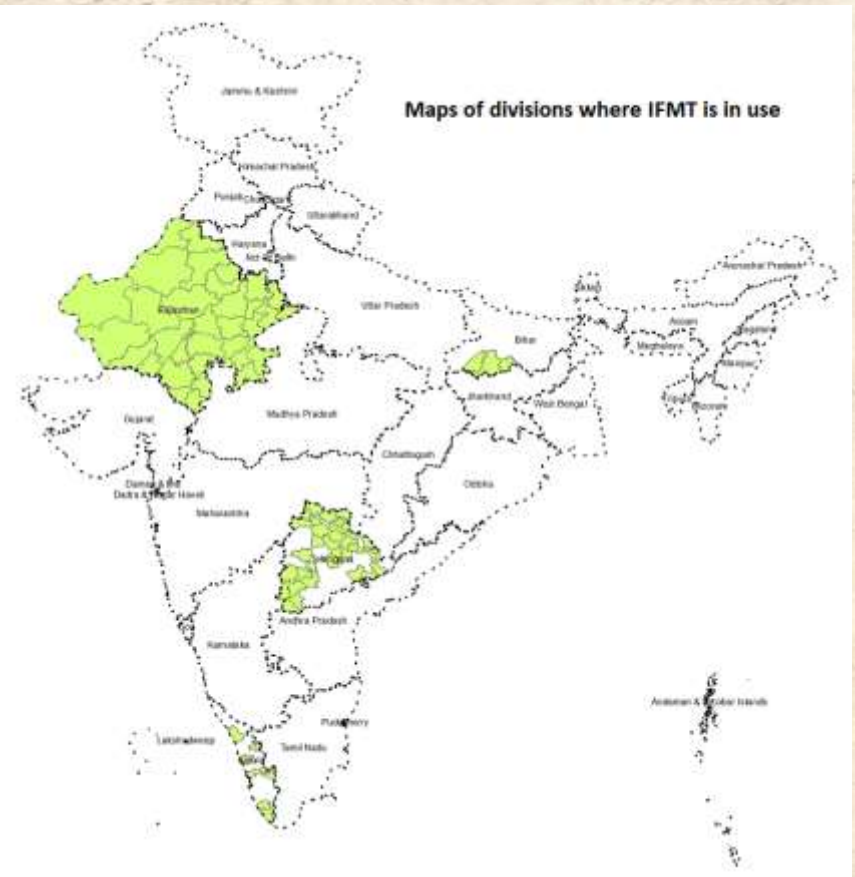


Pre-monsoon increased = 2 meter (2020-22)
Post-monsoon increased = 5 meter (2020-21)

Wells monitored = 435
Depth to water varies from 1 meter to 28 meter from surface

Forest Management Tool

- Working in partnership with Forest Plus
- Enabling development of Forest Working Plans based on Working Plan Code, 2014
- Being scaled in collaboration with Government of India and with State Governments
- Enabling better decision making at the Forest Division Level



- Training of the forest division officials undertaken across 73 divisions
- Implemented in 4 states – saturation in Rajasthan planned in 6 months
- Plans for scaling of the tool to across states and districts through Van App

Forest Right Act (FRA) tool

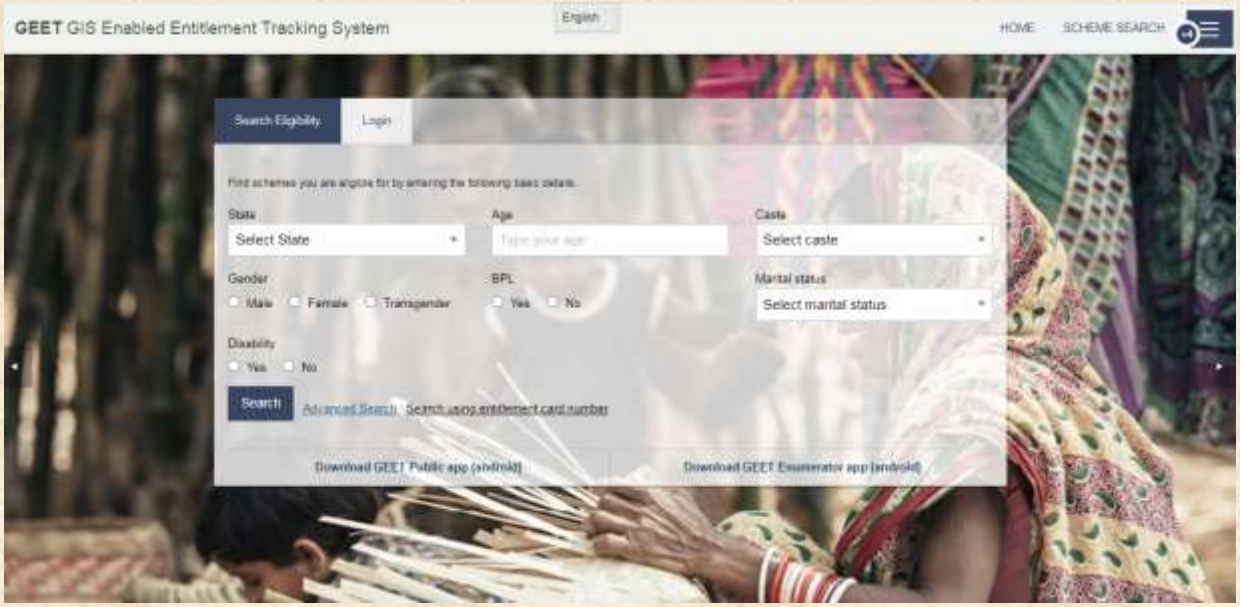
- The tool has been simplified for use at the community level with step wise guidelines
- Enabling observability of the progress of CFR claims (stepwise) at scale
- Implementation at scale in Chhattisgarh in collaboration with Tribal and Forest Department

- Evidence upload facility and use in local language
- The tool is being reviewed by Govt of Chattisgarh for implementation in the field (for CFR)
- For claiming of IFR and survey, the GEET module has been customized and given to Surajpur Forest division of Chhattisgarh and data collection has been initiated

GIS Enabled Entitlement Tracking System (GEET)

A tool that empowers rural communities to gain access to their entitlements

- Scans eligibility criteria of schemes
- Provides information on entitlements, schemes and their eligibility
- Aids state/mission administrations in tracking claimants and helping them avail benefits
- Assists district/state government officials to monitor claimant applications and status of implementation.



- Actively being used by Odisha and Jharkhand livelihood mission
- Piloted by National Institute of Rural Development (NIRD) in GPDP (Antodaya program)
- Discussions in advanced stages with Azim Premji Philanthropic Initiatives (APPI) across all their partners

Knowledge Commons

- Enhance reach of data sets and analytics to the ground in an intelligible manner
- Position village communities/end users at the center of decision making
- Promote evidence based decision making
- Nurture an ecosystem platform that converges
  - Local and external knowledge
  - Initiatives of various NGOs, GOs, Academia and Funders
  - (into a) Grid of data servers
  - and gives expression to thought leadership

Thanks