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`Tying the Digital Knots' – Bonn, Sept. 2018

Using GIS for Integrated Natural Resource Management (INRM)
Planning of world's largest rural wage work social protection programme

The case of MGNREGA: GIZ India

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MGNREGA aims to enhance livelihood security in rural areas by providing minimum 100 days of guaranteed wage employment to a rural family in a year.

Budget outlay of 7 billion euros for 2018-19 alone.

Highest budget allocation for a rural development programme in India.

Expenditure since inception until 2018 (so far) is 54.73 billion euros.

126 million registered households covering 250 million people across 685 districts.

Provides wage employment to over 60 million households every year.

Thus, the **largest wage work programme in the world.**

Women form 54 percent of the workforce.

MGNREGA includes 281 permissible works - **181 works are focussed on Natural Resource Management**, of which 84 are exclusively related to water.
60 percent of expenditure mandated on NRM related works.

96 percent of wages paid through digitized direct beneficiary transfer mechanisms.

31 million assets of the 33 million assets created have been geo-tagged (so far).

'Mission Water Conservation' launched by Government of India in 2016 to provide special focus to water stressed and irrigation deprived regions.

Challenges for INRM in social protection/PWP programme

- Being a demand based wage employment programme with a ready budget, a **sufficient number of works** should always be available.
- **Mandatory expenditure of 60%** budget on NRM related works.
- Planning, especially on watershed basis difficult to take down to 600,000 villages
- Involve more of the `poorest of the poor and vulnerable population' of the **250 million** beneficiaries in planning process.
- Good planning = good basis for implementation = base for **effective monitoring mechanisms**

What is GIS?

- Geographic Information System (GIS) – systematic approach to digitally manage and analyse spatial and geographic data
- Platform for data integration and decision support system:

  satellite images + geological and socio-economic statistical data + indigenous knowledge + local priorities
- Satellite imagery is easily and publicly available
- Therefore: promising tool for planning interventions on the ground level
- Saves cost and time, as it can be done on a laptop with internet connection on a real-time hands-off basis.

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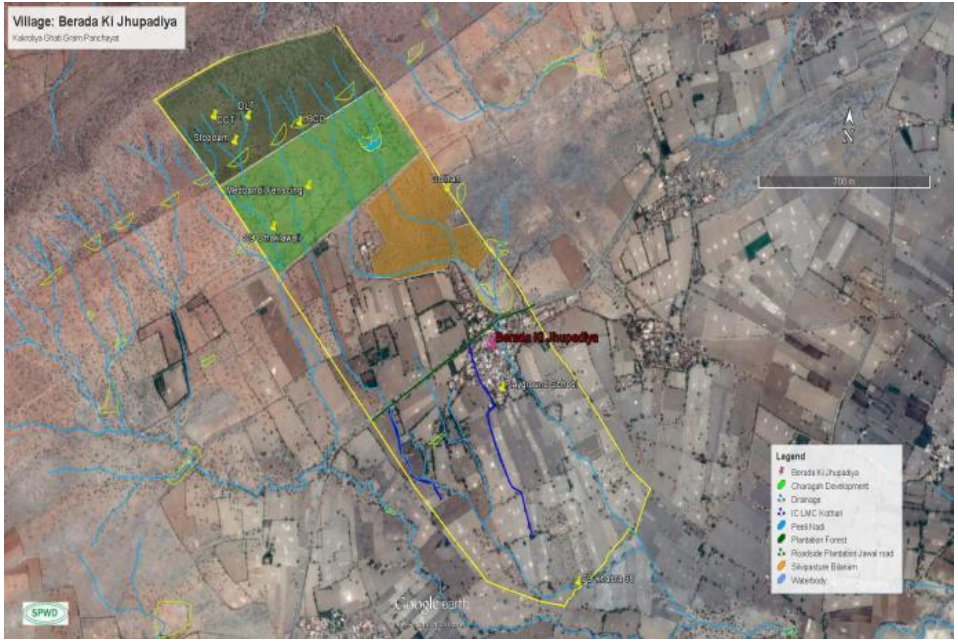
GIS-based INRM planning of MGNREGA

- Uses web-gis imagery from Government's Bhuvan portal and Google earth
- Participatory GIS based planning methodology created – Handbook developed (https://rural.nic.in/sites/default/files/nrega/Library/Books/3_Handbook_for_INRM_Planning.pdf)
- Cascade of trainings provided to whole country : National – State – District – Blocks
- 26 GIS Facility Centers are being set up in 3 project States by GIZ. Ministry of Rural Development to replicate model through 30 more centers in 29 States and 2 Union Territories



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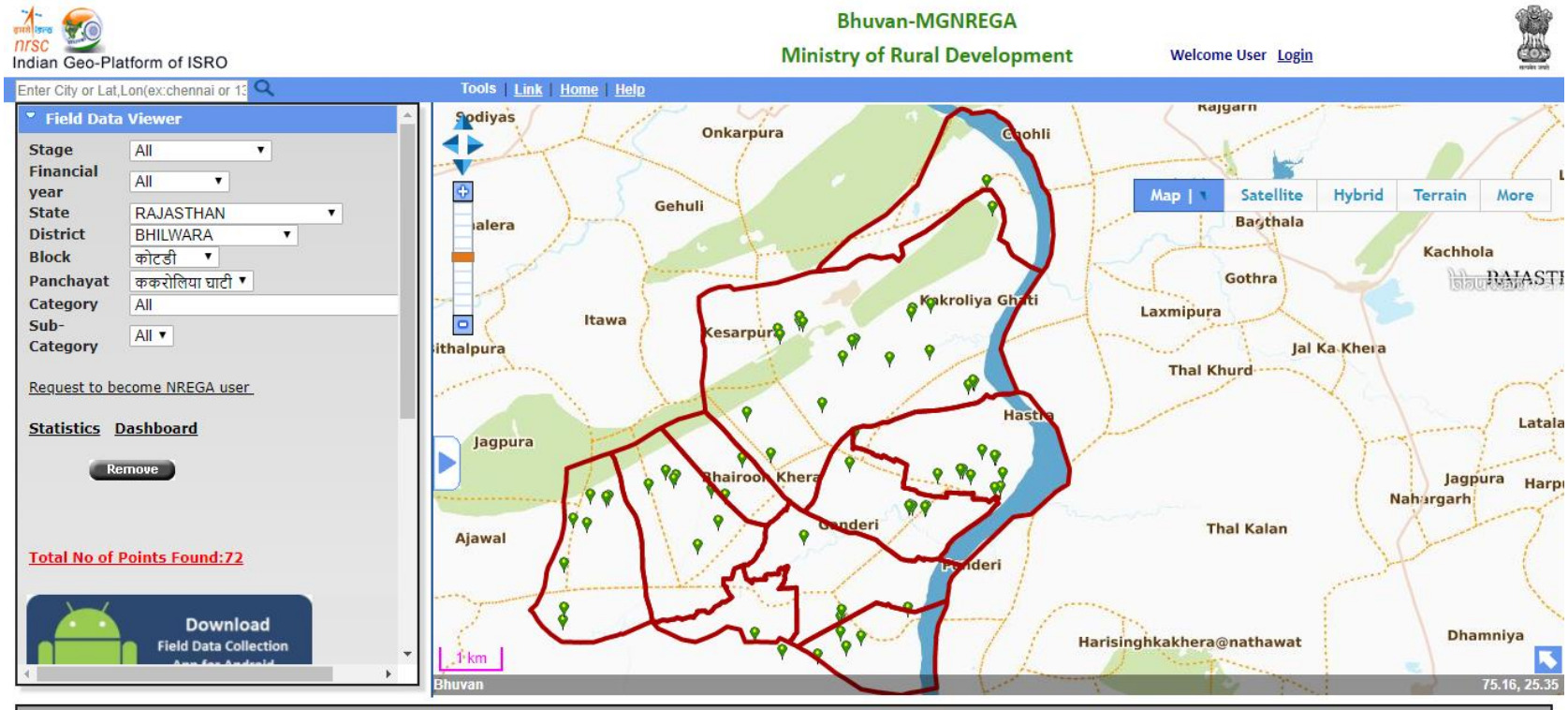
Existing MGNREGA NRM Assets Map



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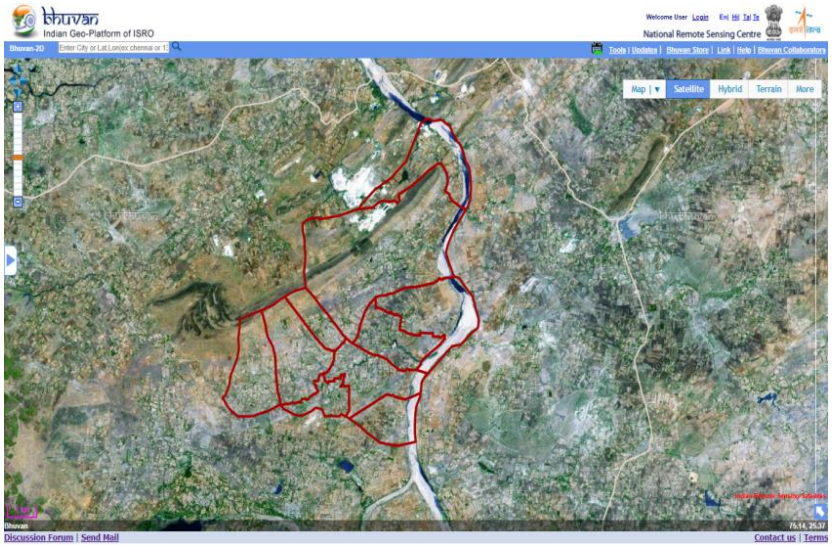
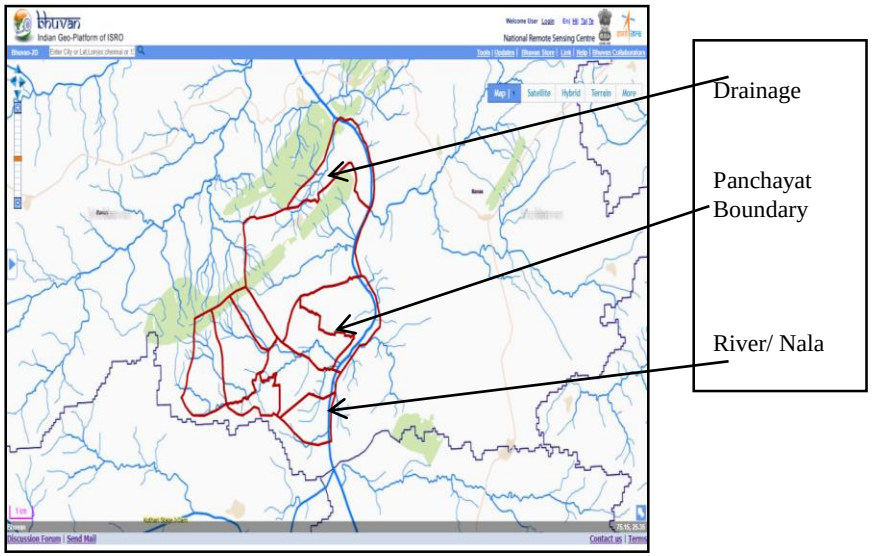
Satellite Map



Drainage Map



(Maps are taken from the ISRO-NRSC website of Government of India, and are used for representative purposes.)

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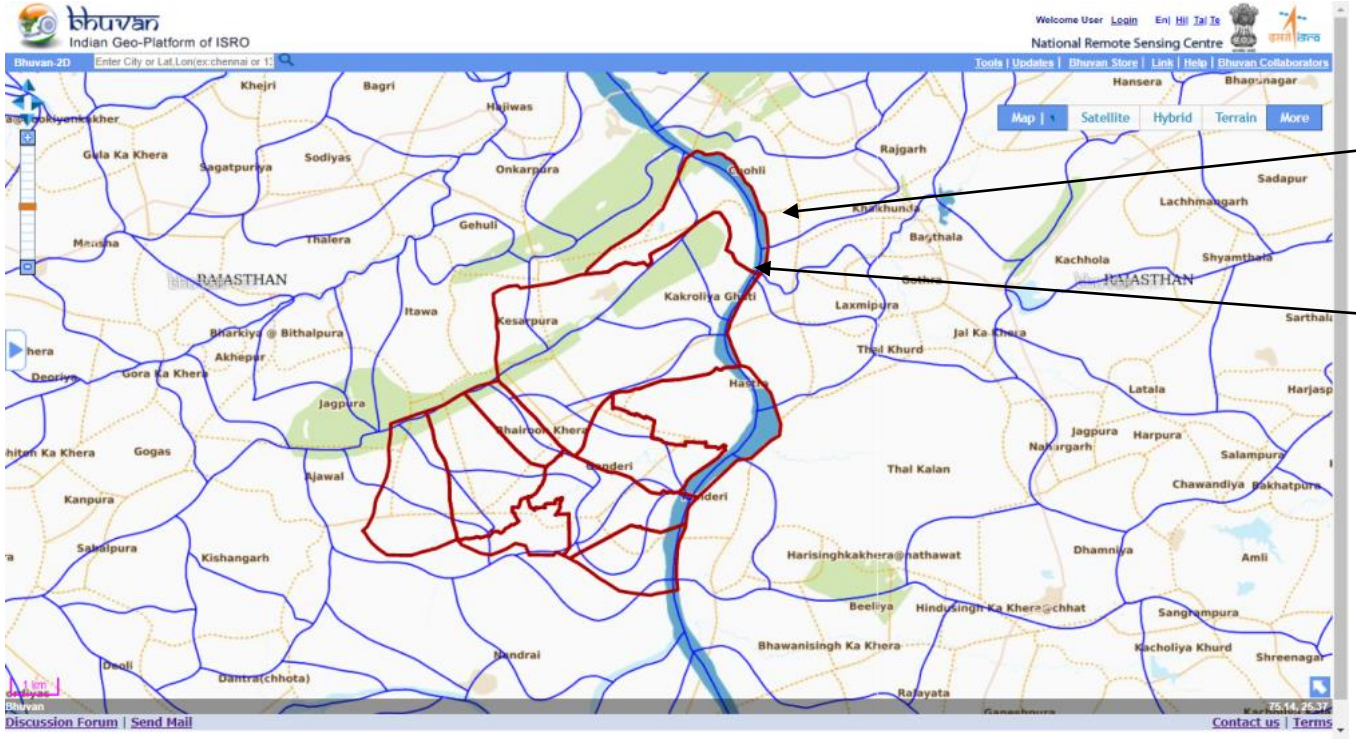
Watershed Map



Panchayat Boundary

Watershed Boundary

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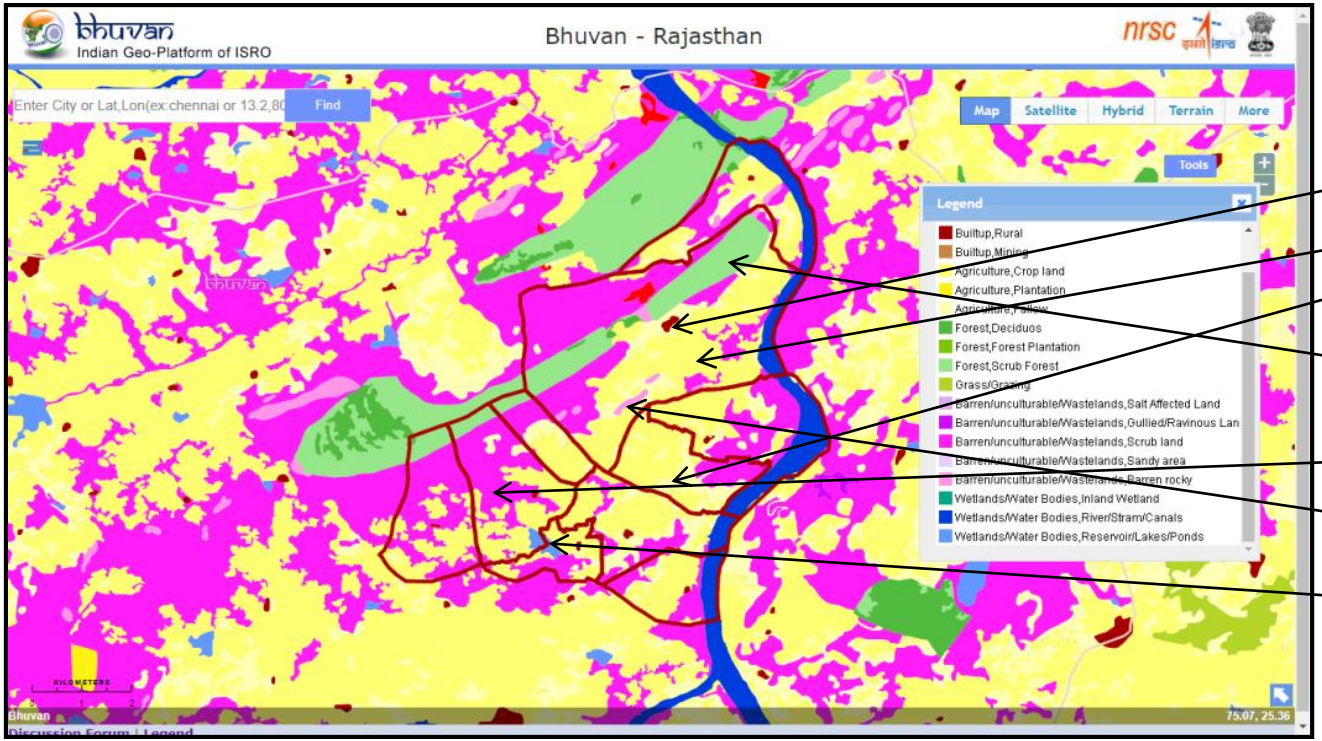
Land use land cover map



Legend
Builtup,Rural
Builtup,Mining
Agriculture,Crop land
Agriculture,Plantation
Agriculture,Fallow
Forest,Deciduos
Forest,Forest Plantation
Forest,Scrub Forest
Grass/Grazing
Barren/unculturable/Wastelands,Salt Affected Land
Barren/unculturable/Wastelands,Gullied/Ravinous Lanc
Barren/unculturable/Wastelands,Scrub land
Barren/unculturable/Wastelands,Sandy area
Barren/unculturable/Wastelands,Barren rocky
Wetlands/Water Bodies,Inland Wetland
Wetlands/Water Bodies,River/Stram/Canals
Wetlands/Water Bodies,Reservoir/Lakes/Ponds

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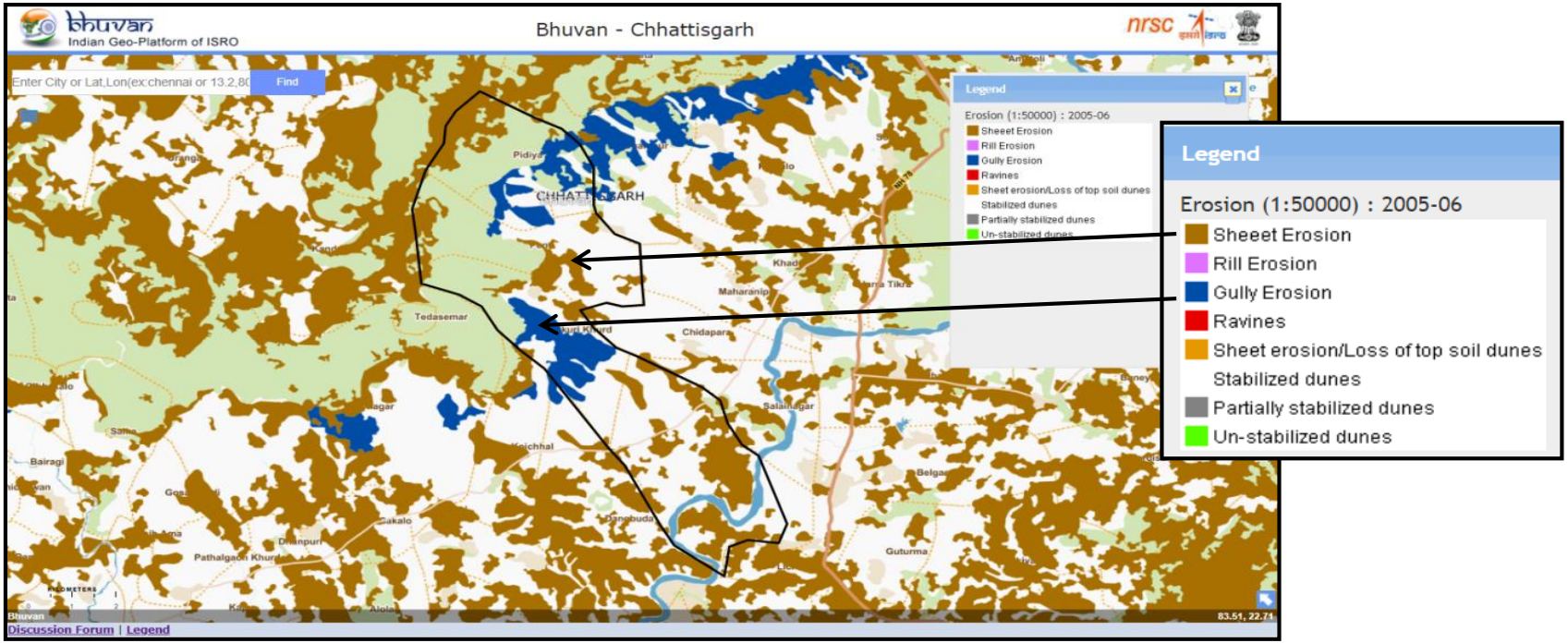
Soil Erosion Map



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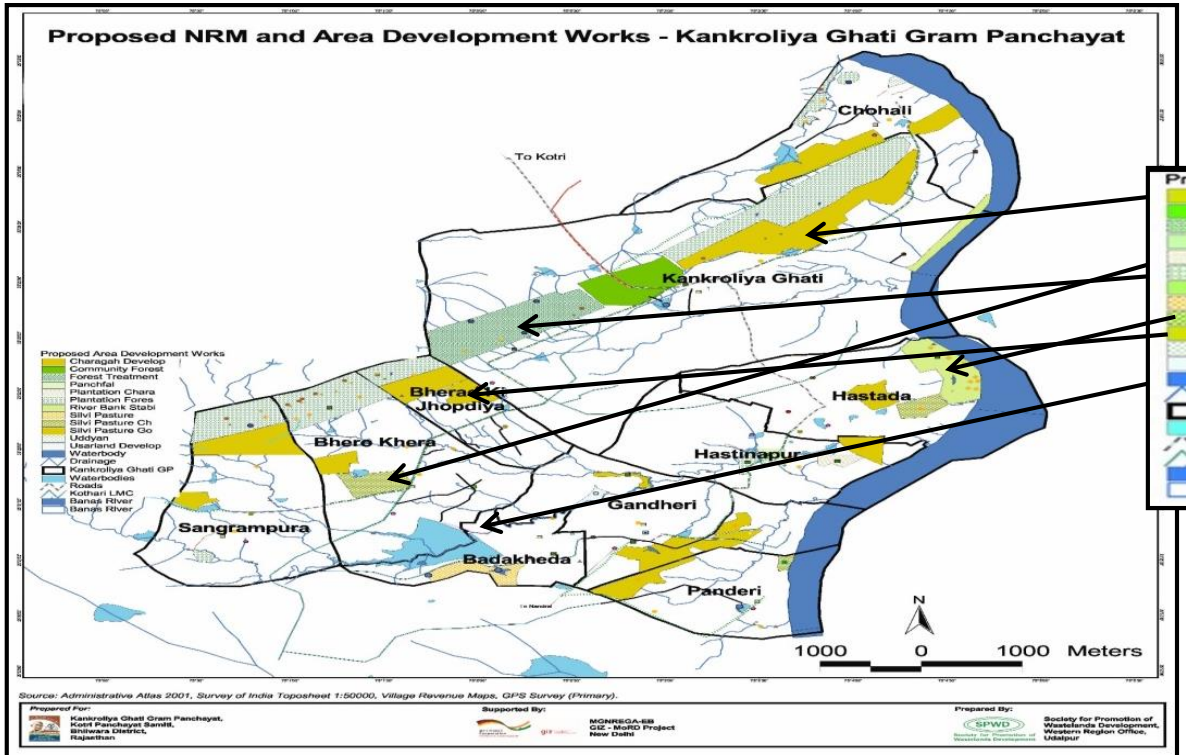
MGNREGA Action plan map



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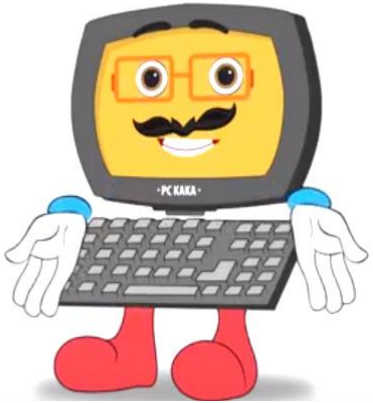
e - Saksham

Digital Learning Platform for MGNREGS

- 65,000 technical ground staff of MGNREGA can all be leveraged as GIS planners but they have high turnover and basic education and limited computer skills
- Most have smartphones or access to a computer - Massive Open Online Course (MOOC) as disruptive technology
- Anybody can access the course from anywhere anytime through a computer or the mobile application.
- Accessible from MGNREGA website (www.nrega.nic.in)
- 2,2 hours of course material to train 65.000 participants nationally
- 10.000 GP level INRM plans as an expected outcome by 2019



Emergent possibilities – Data sequencing & integration

- GIS based approach helps to create 5 year perspective plans – annual plans can be taken out based on budget available (one time effort)
- All planned activities are geo-tagged (can be tracked and monitored from distance, publically and over time horizons)
- Action plans connect to SECURE software for technical and administrative approvals (time-bound and transparent process)
- Electronic Fund Management System disburses funds (quick implementation enabled)
- Direct Bank Transfers of wages directly to workers (96% of 76 million last year)
- Spatial GP plans available on Bhuvan for convergence with other departments

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Discussion with participants:

Where in your work can such a tool be useful?

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Thanks

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