

# STUDIES IN WATER QUALITY & SANITATION



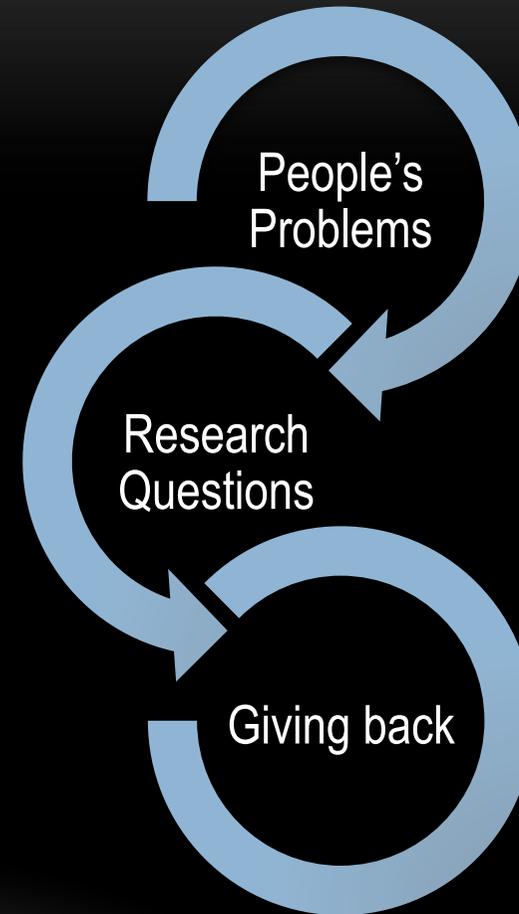
Bakul Rao

Centre for Technology Alternatives for Rural Areas

Indian Institute of Technology, Bombay

# Content

- Background
- Perspectives in W&S
- Water Quality
- Sanitation
- Learnings
- Linkages



# Background

## Visit to Chikurde to see organic farming in 2011



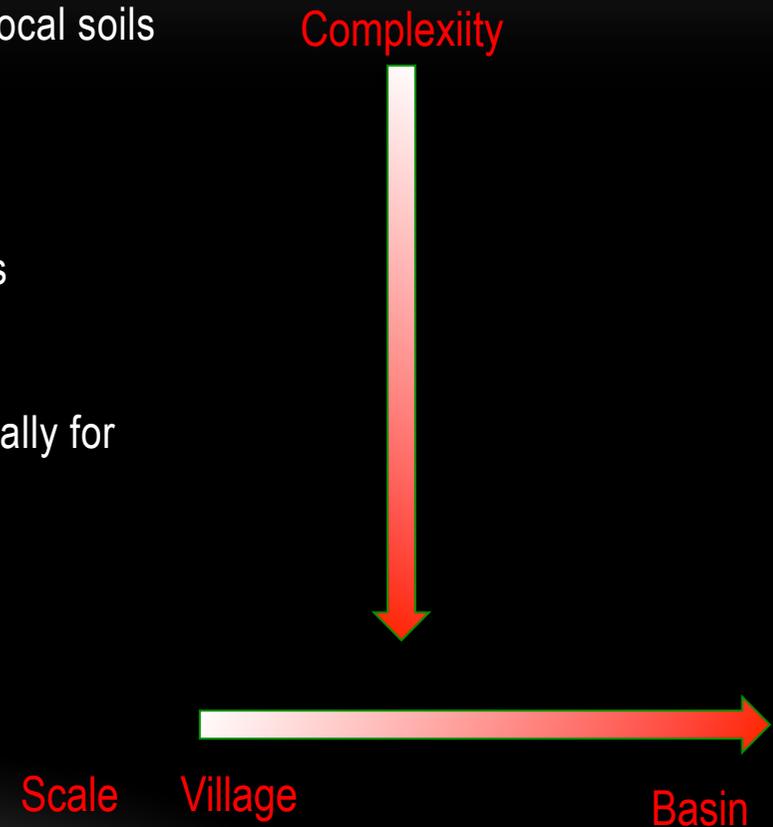
- Well water not usable for irrigation or drinking?
- Some lands unusable due to high salinity
- Inadequate water for households
- Water logging problems in some of our lands

# The Questions

- Where does the water supplied go?
- What is the quality of water supplied to the people?
- What is the inputs from agriculture to drinking water sources
- How does the sanitation scenario influence the drinking water quality
- How does local soil quality influence the water quality?
- Understanding of pollutants/contaminants transport in ground water
- Agricultural Water Loading and Water logging & Salinity Issues

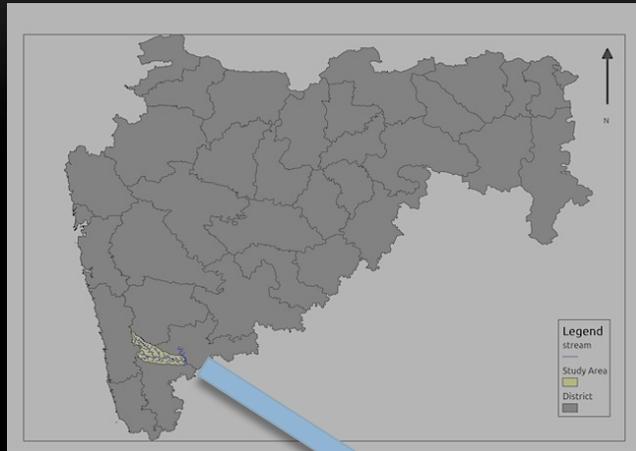
# The Challenge

- Lack of base maps for GPs, watersheds, drainages, local soils
- No / Incomplete and Incorrect Data
- No region level irrigation / cropping policy
- No synchronised water supply and sanitation systems
- No low cost sewerage system
- No regional level study for pollutants transport especially for non-point pollutants
- No treatment of nitrates and phosphates from NPS

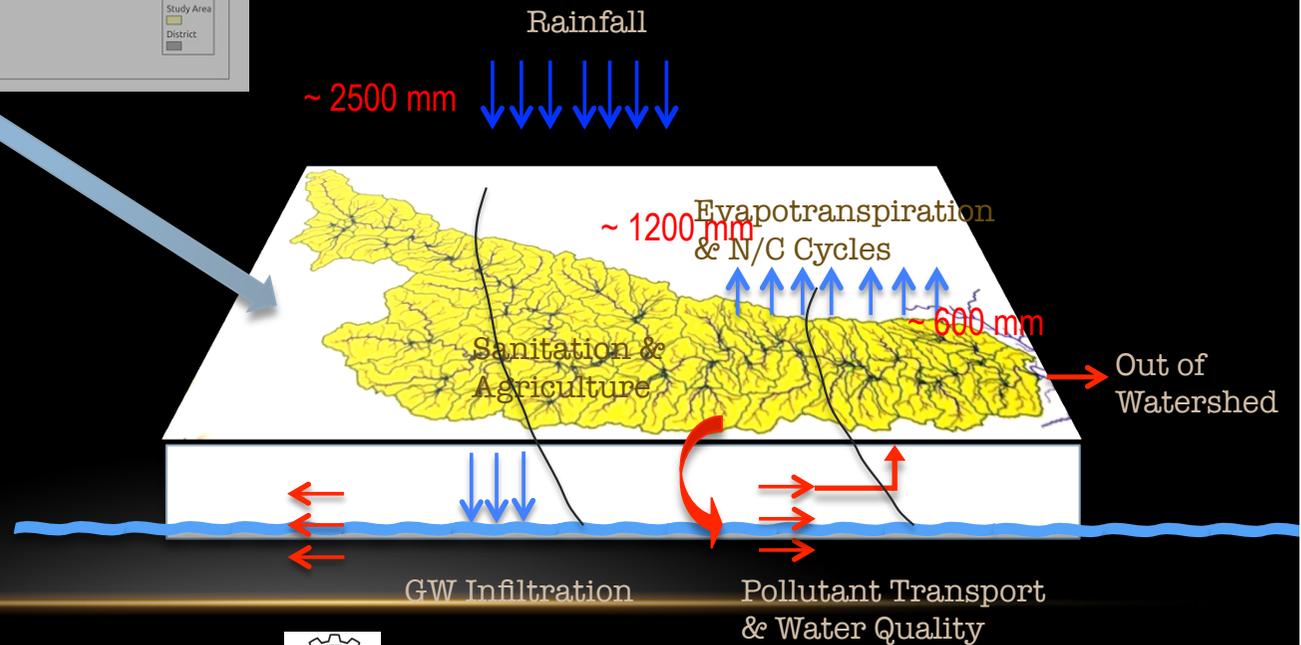


# The Warana Basin

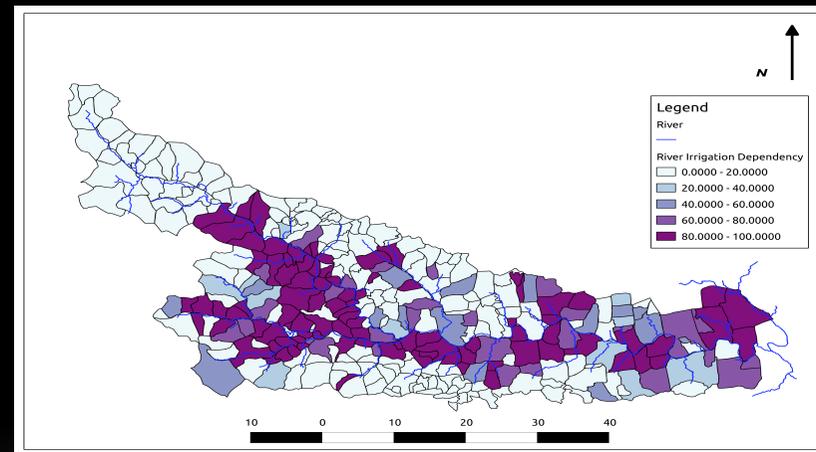
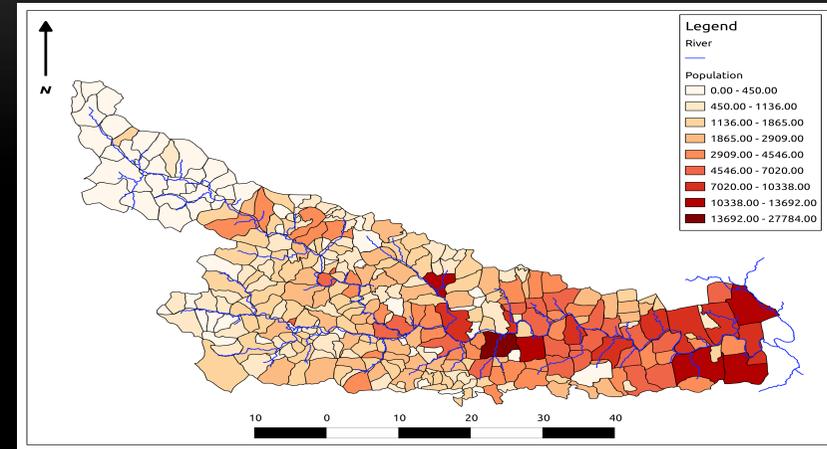
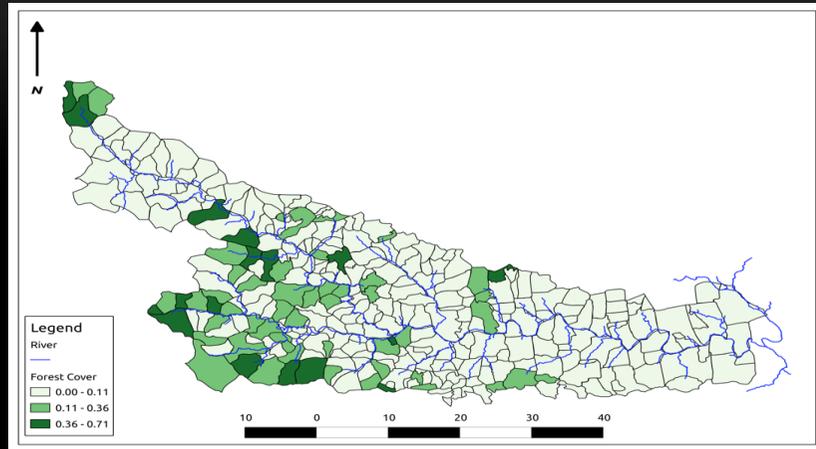
Need for linking basin approach with village units for water & sanitation



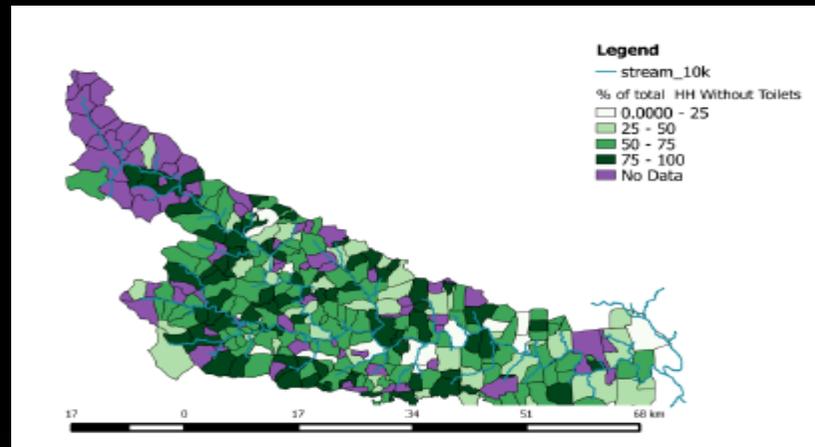
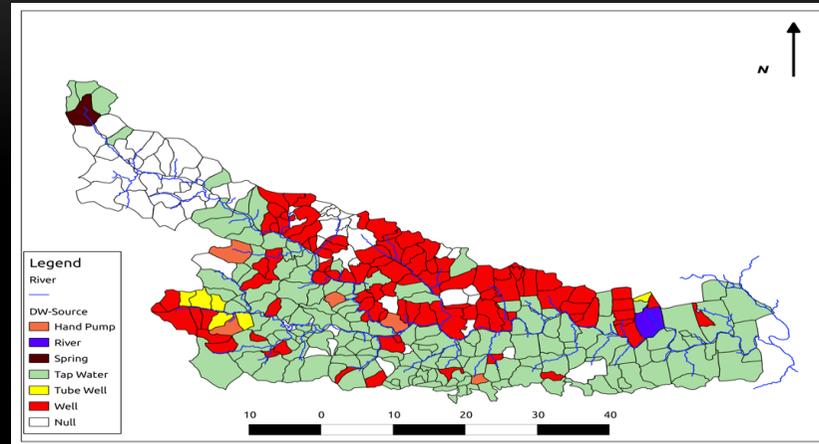
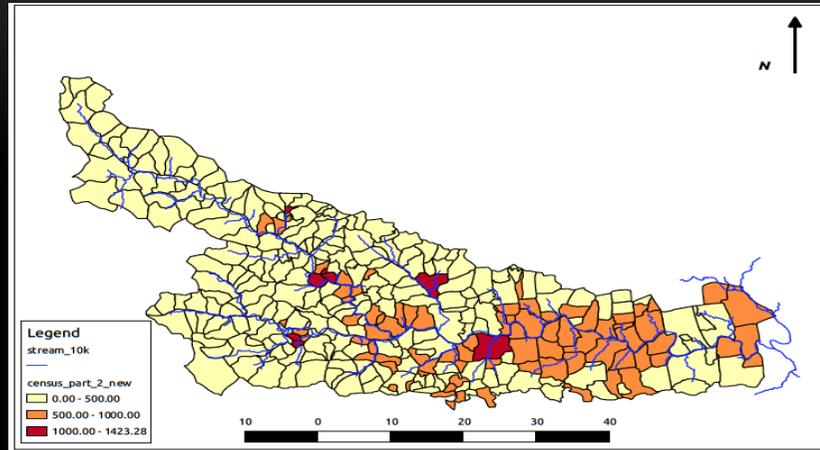
Tributary of Krishna  
Length: 150 km  
Area: 2095 km<sup>2</sup>  
Villages: 319



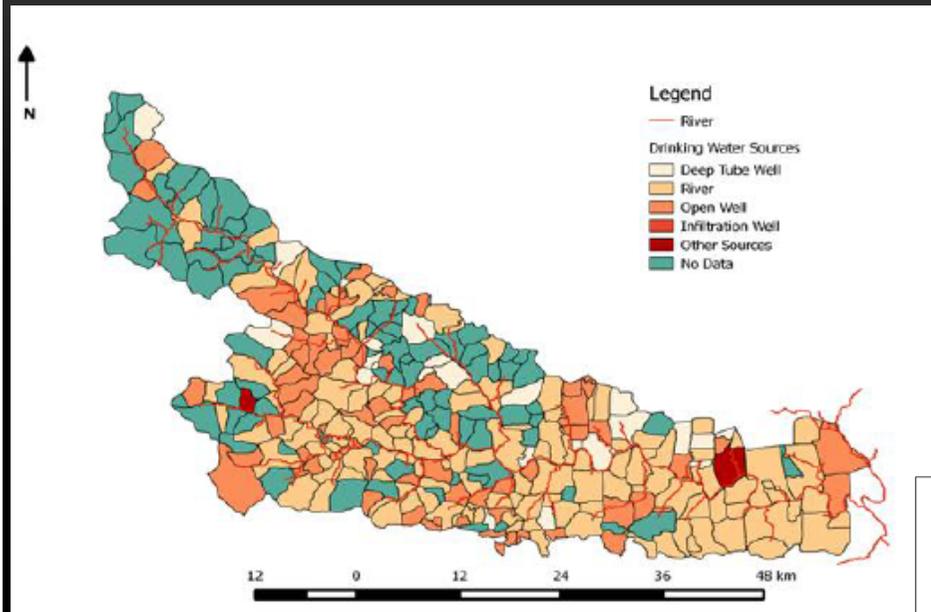
# Warana Basin



# Warana Basin

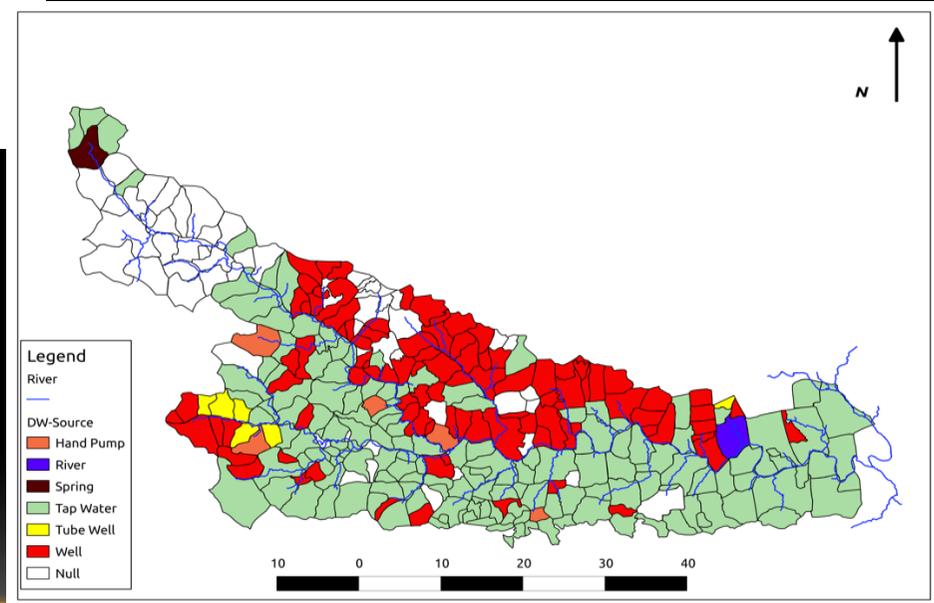


# Village / habitation locations

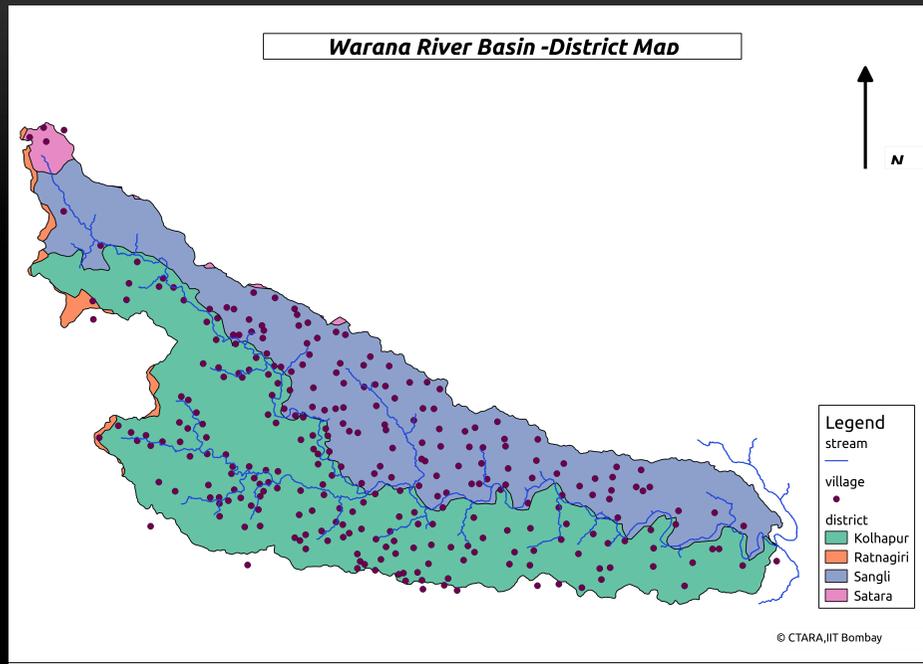


NRDWP data

Census Maps

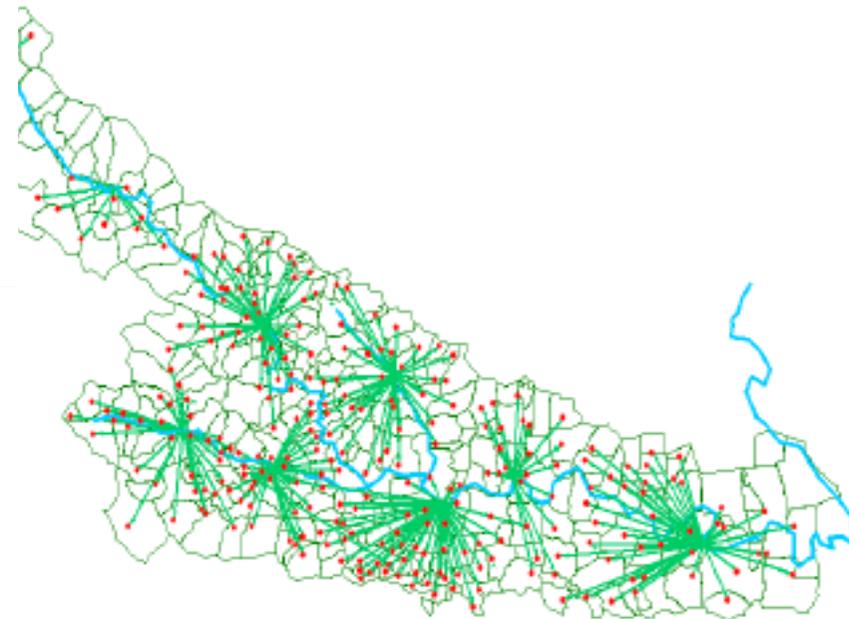


# Village / habitation locations

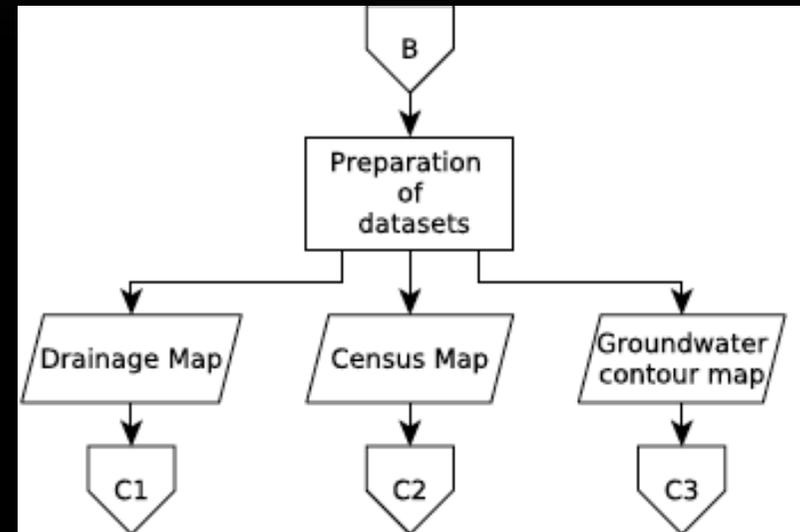
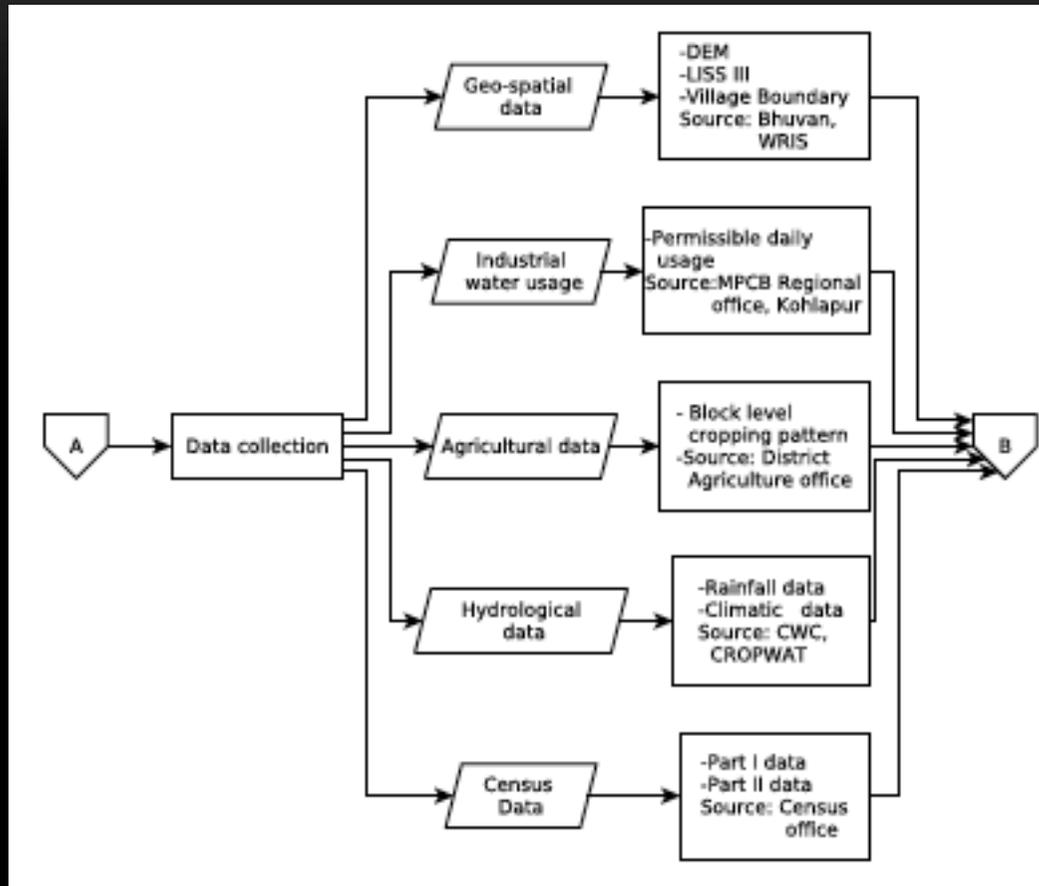


SOI Toposheets

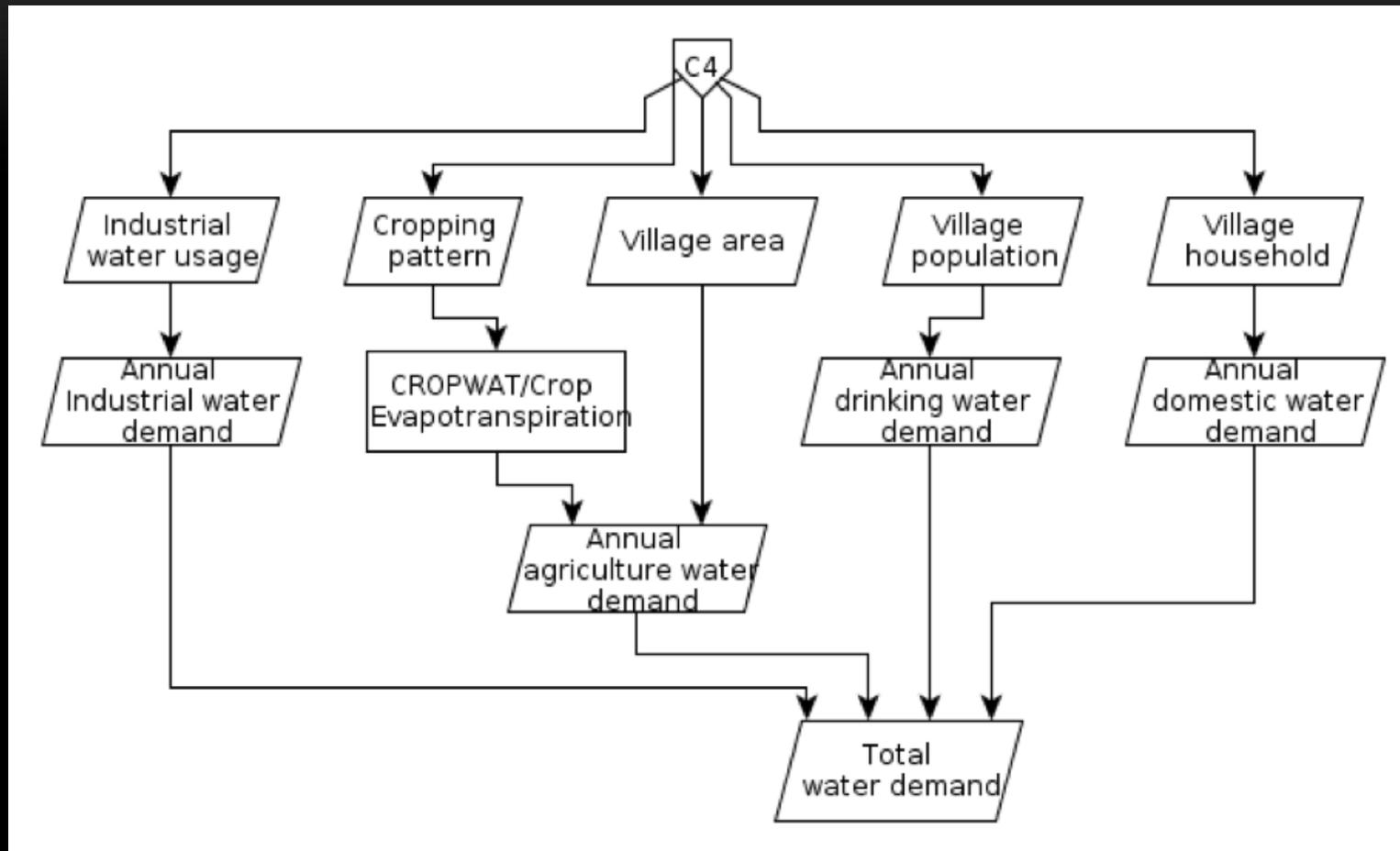
Google Maps



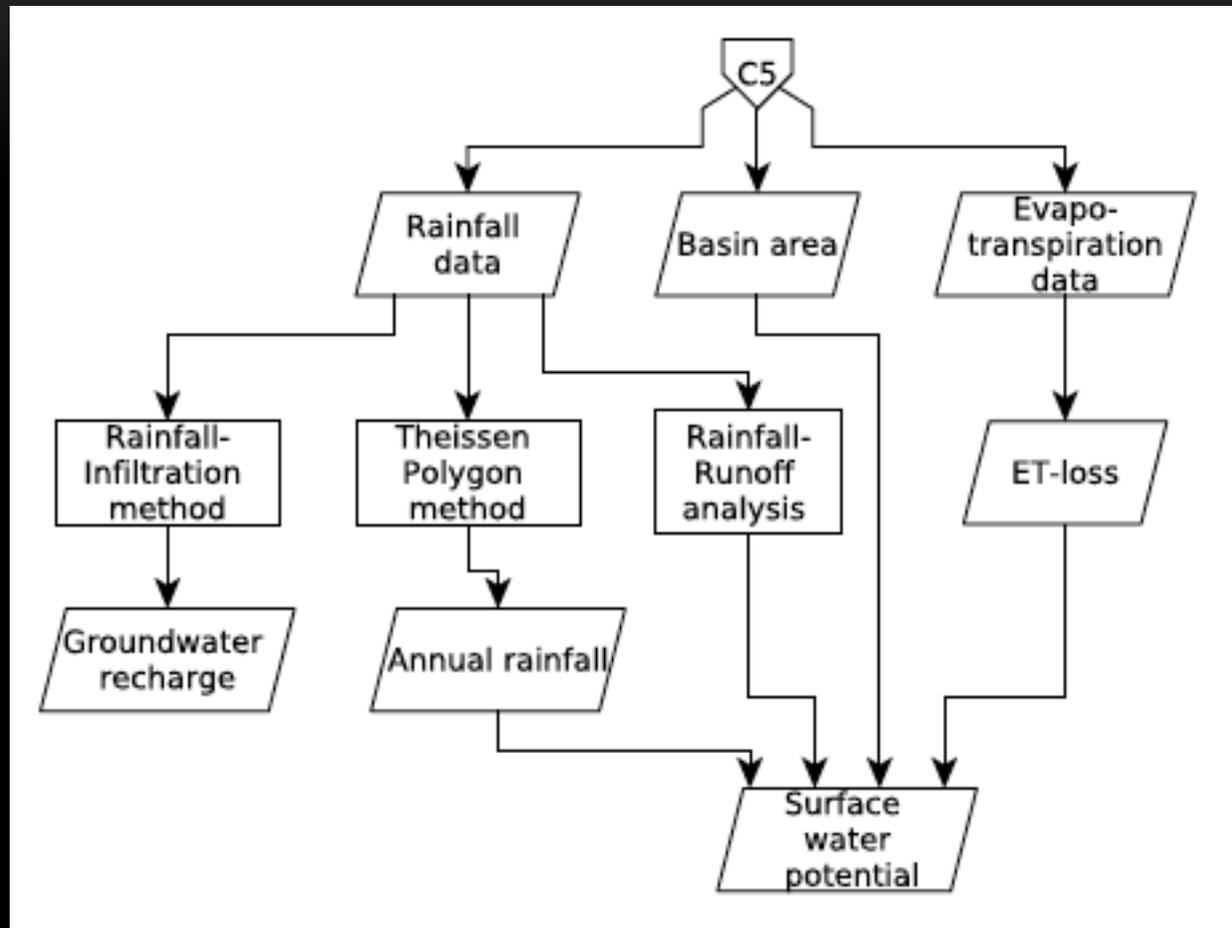
# Integrated River Basin Plan



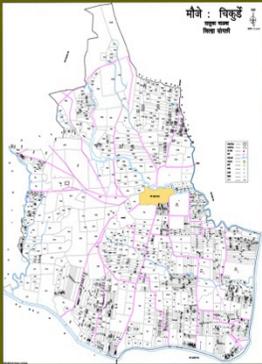
# Demand Estimation



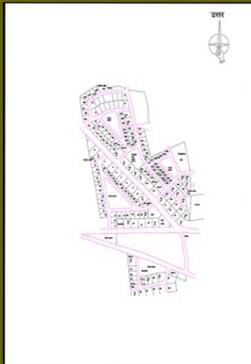
# Supply Estimation



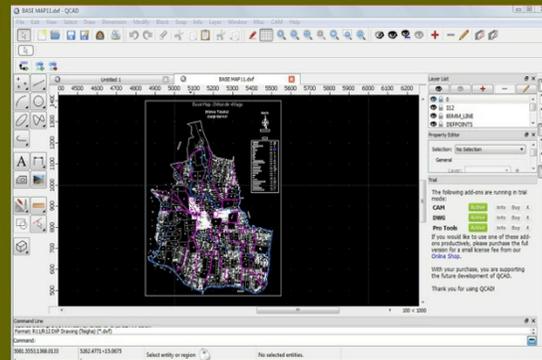
# Chikurde Gram Panchayat



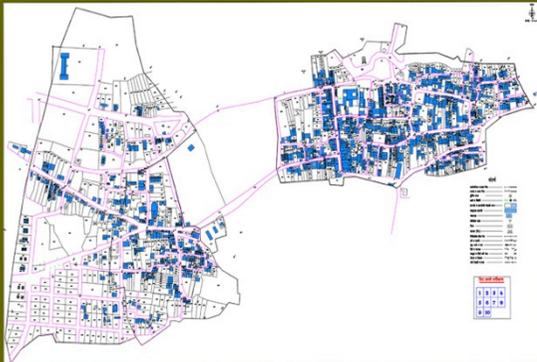
Revenue Map



Resettled Area Map

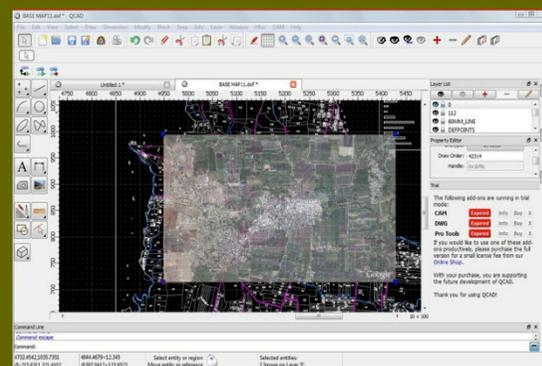


2. Scaling and Merging Various Maps

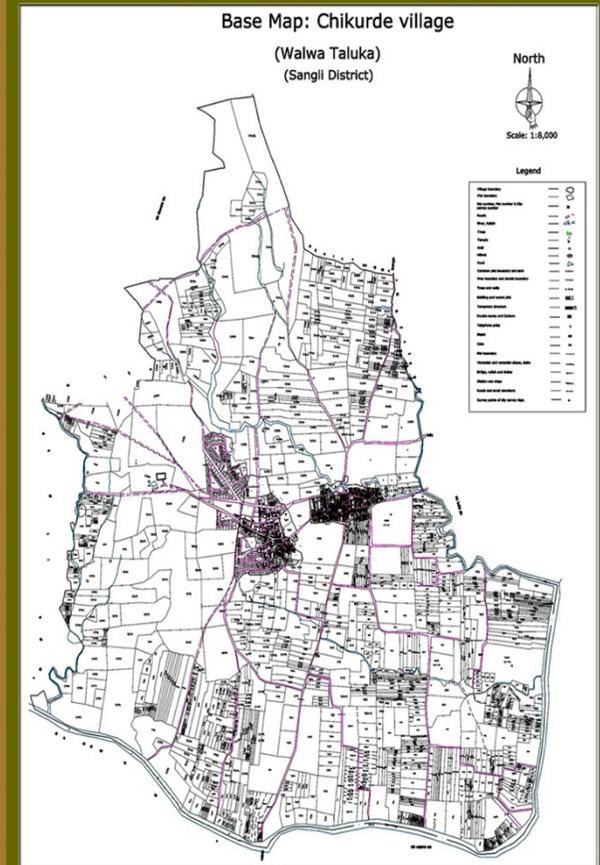


Gaothan Map

1. Collection of Maps and Digitization



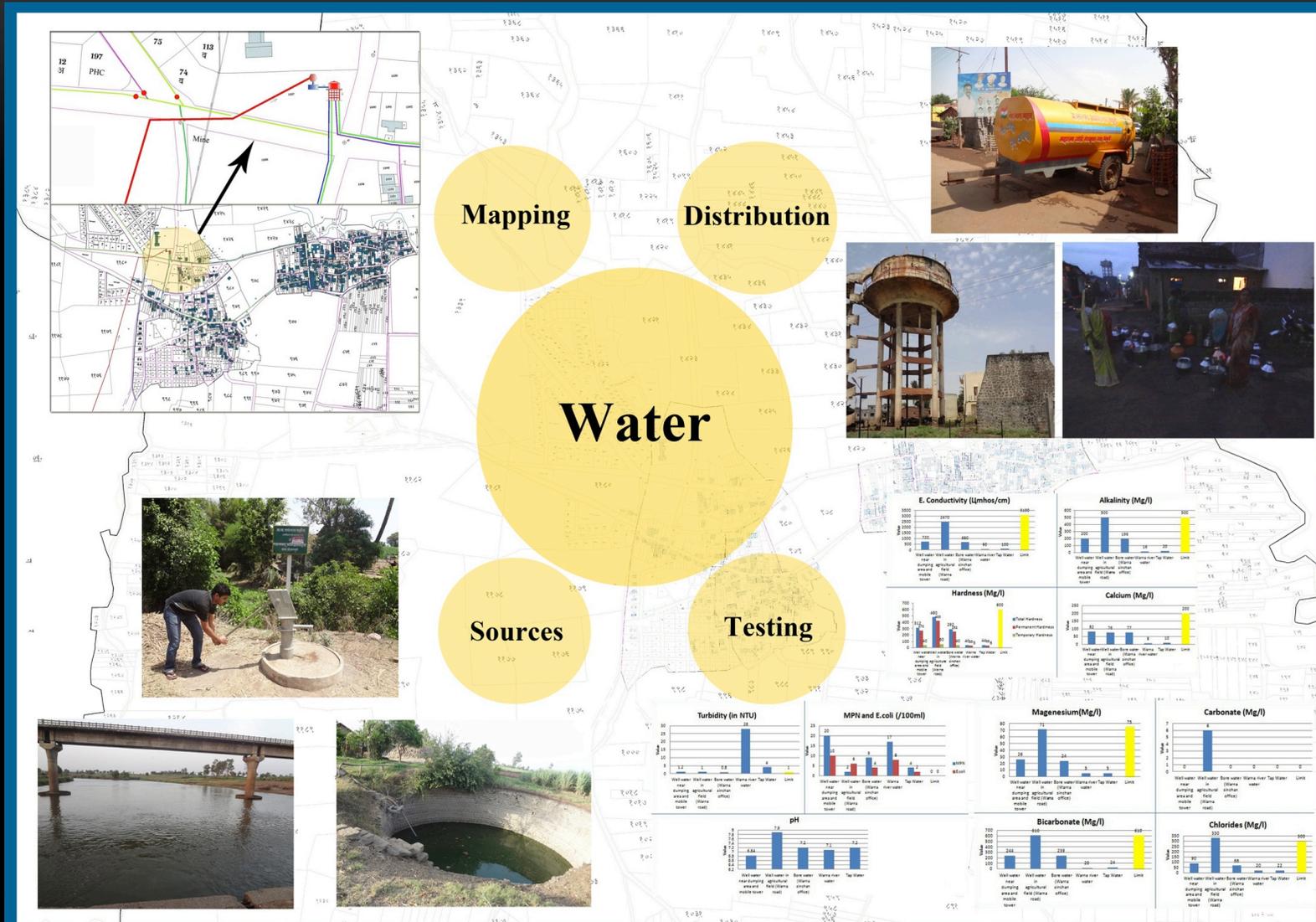
3. Updating Maps



4. Base Map

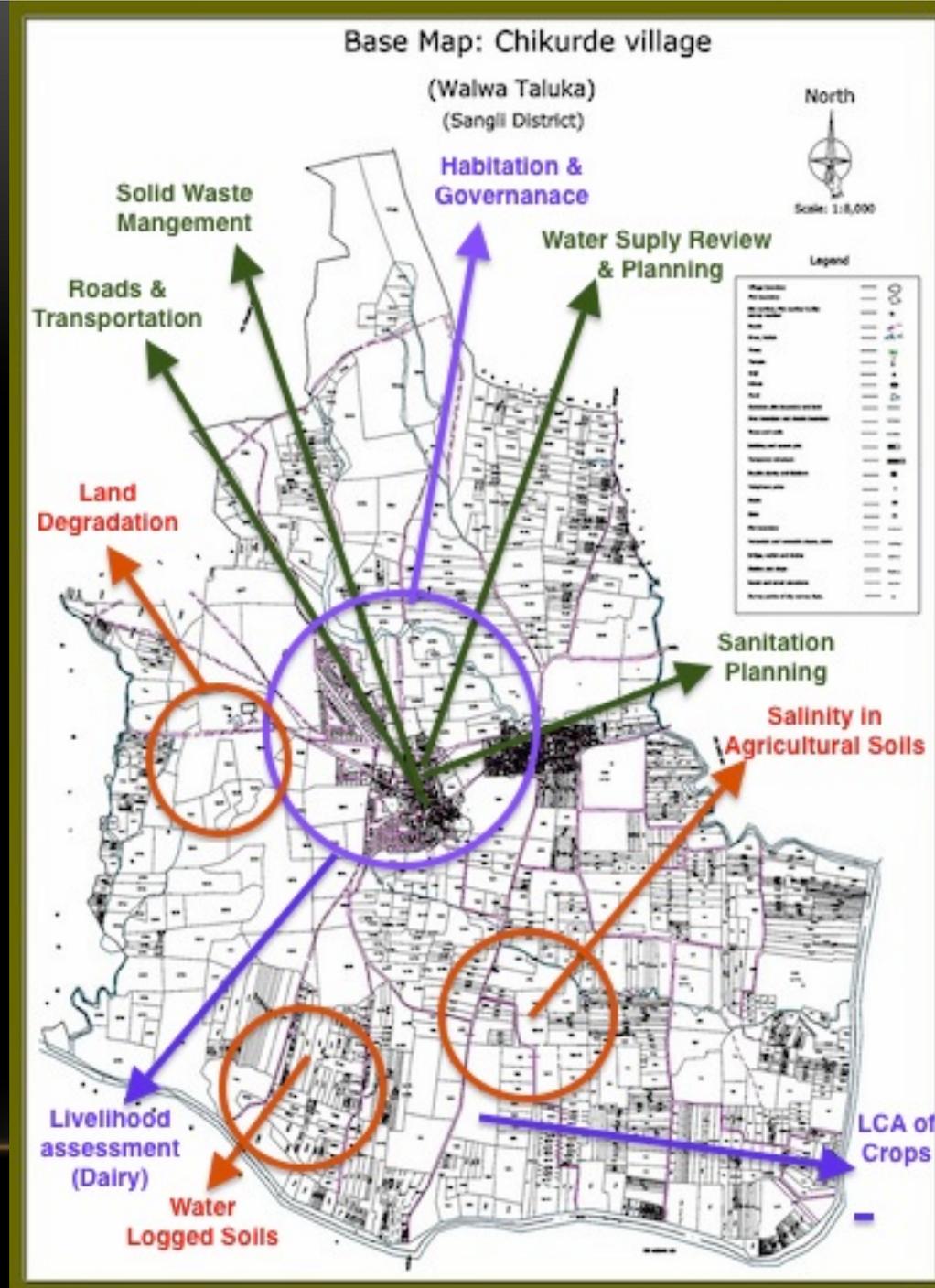


# Water Scenario - Chikurde





# Chikurde Studies



# Water Problem Identification Tool

Listing of problems

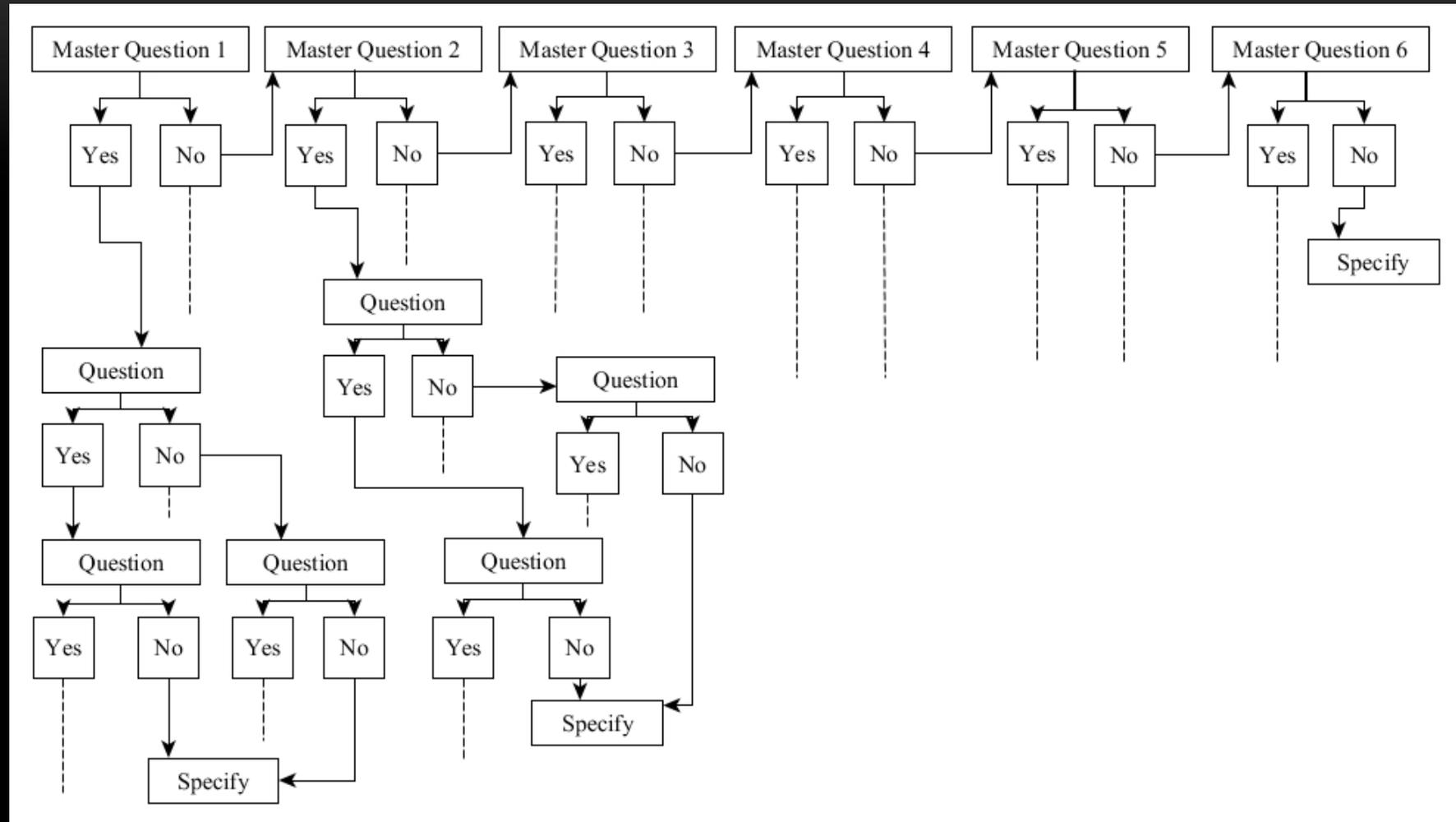
Development  
of linkages

Designing of  
Problem tree

Testing of the  
problem tree

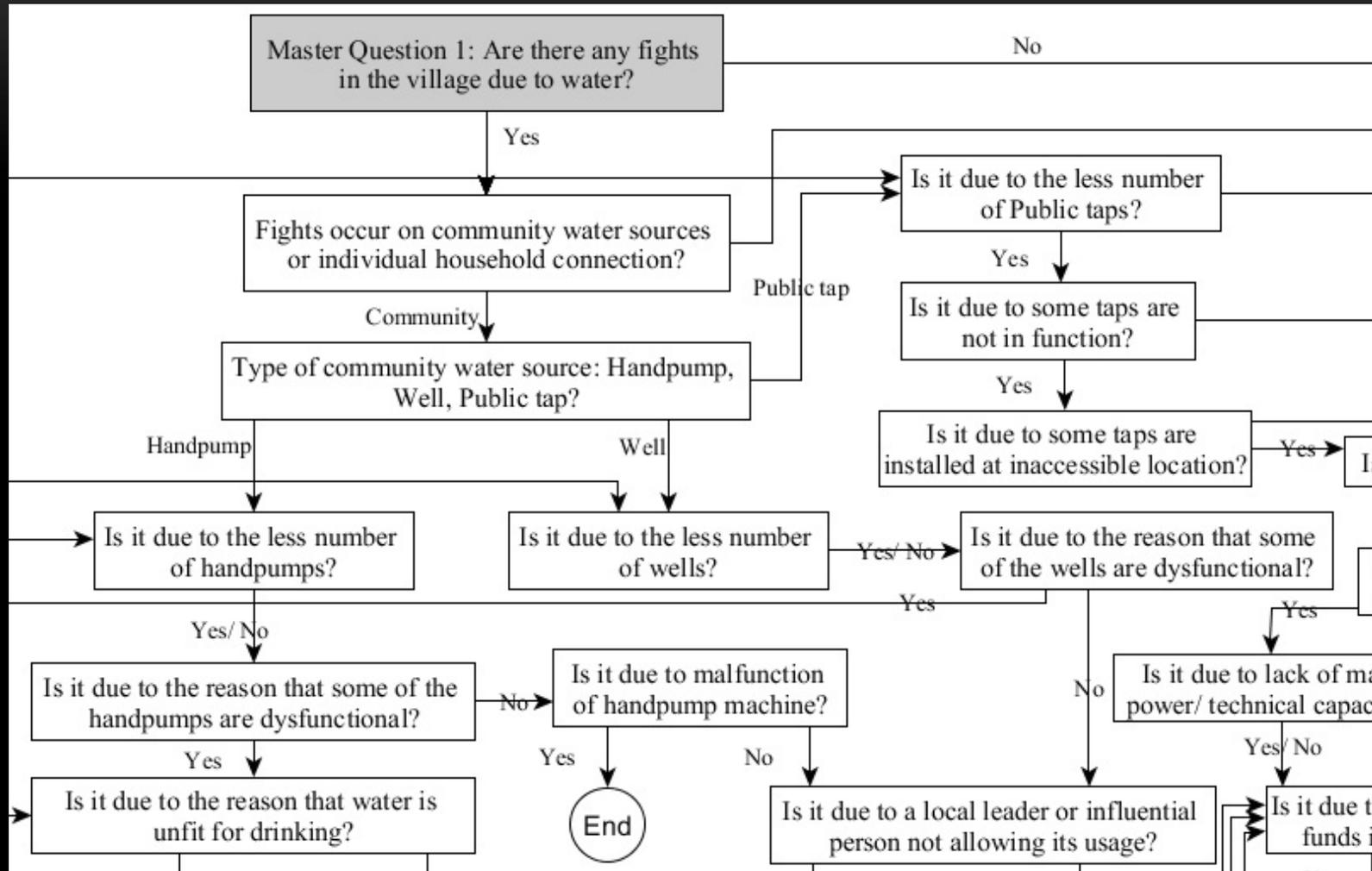


# Water Problem Identification Game





# Water Problem Identification Game



# Learnings / Research Outputs

- Sewerage System Design – Specific for Rural Areas (TD 654)
- Linking water, sanitation, solid waste and roads plans and implementation (Village Plans)
- Nutrient-shed approach towards water quality (NPS)
- People's level planning of natural resources
- Replicability possibilities

- 2012: Kirubaharan – IRBP; Ajith – NO<sub>3</sub> in DW treatment
- 2013: Apoorva – Soil Mapping & Salinity Assessments; Nataraj – LCA of Sugarcane
- 2014: Nishant – Village Planning for Water, Sanitation, etc.; 8 TDSL students; Akanksha and Pragyan – TD 609
- Shridhar Kumbhar – pursuing PhD



# Linkages



" गावचा विकास हाच आम्हांचा ध्यास " ☎ ०२१३३-ऑ.-२२३१०२

**ग्रामपंचायत कार्यालय, मंचर**  
**GRAMPANCHAYAT KARYALAY MANCHAR**

**मु. पो. मंचर, ता. आंबेगाव, जि. पुणे.**  
A/p. Manchar, Tal, Ambegaon, Dist. Pune. 410 503

---

जावक क्र. १०३५/०११/१२ दि. १८/१०/२०११

प्रती,  
मा.श्री.मिलींद सोहनी  
हेड ऑफ द डिपार्टमेंट, सेंटर फॉर टेक्नॉलॉजी  
अल्ट्रास्ट्रॅटिक्स फॉर रुरल एरियचे CTARA इलेक्ट्रिकल डिपार्टमेंट  
इंडियन इन्स्टीट्यूट ऑफ टेक्नॉलॉजी IIT  
पवई, मुंबई.

विषय:- मोजे मंचर, ता. आंबेगाव, जि. पुणे येथील शहराचा विकास कृती आराखडा  
(मास्टर प्लॅन) तयार करणेबाबत.

महोदय,  
वरील विषयाच्या तुरुंगस या पत्राच्या विनिती करणेत येते की, मोजे मंचर,  
ता. आंबेगाव, जि. पुणे येथील शहराची लोकसंख्या दिवसेंदिवस वाढत आहे व त्यामुळे  
शहरामध्ये निवासी तथा वाणिज्य स्वरूपाच्या भव्य इमारती मोठ्या प्रमाणात साकारत  
आहे. त्यामुळे शहरातील नागरिकांना नागरी सुविधा उपलब्ध करणे ग्रामपंचायतीस  
अशक्य होत आहे. या कारणास्तव शहराची वाढती लोकसंख्या व विस्तार पहिला  
शहराच्या सर्वांगीण विकास कामाकरीता आपले मार्फत मोजे मंचर शहराचा विकास कृती  
आराखडा (मास्टर प्लॅन) तयार करणेत याबा असाणारी नियमानुसार फि ग्रामपंचायत  
भरणेस तथा या कामी योग्य ते सुलक्ष्य करणेस ग्रामपंचायत सक्षम आहे. तरी विनिती की,  
मोजे मंचर, ता. आंबेगाव, जि. पुणे येथील शहराचा विकास कृती आराखडा (मास्टर प्लॅन)  
तयार करून ग्रामपंचायत प्रशासनास सहकार्य करावे.

कळावे.  
प्रत माहितीसाठी:-  
मा. गटविकास अधिकारी सो. (उ.शे)  
पंचायत समिती, आंबेगाव  
कार्यालय- चोडेगाव

  
ग्रामविकास अधिकारी,  
ग्रामपंचायत मंचर  
ता. आंबेगाव, जि. पुणे

  
सरपंच  
ग्रामपंचायत मंचर  
ता. आंबेगाव, जि. पुणे



# Thank You

[bakulrao@iitb.ac.in](mailto:bakulrao@iitb.ac.in)

9619182552