R. and D. in Rural Drinking Water
Project Proposal

CTARA and Inter-disciplinary Group
IIT-Bombay

Basic Themes

- Data-current and past, governance and monitoring.
- Single and Multi-village schemes.
- What should be the GP-level documentation.

- Wider issues-regeneration of groundwater.

All from the perspective of sustainable access to sufficient good quality drinking water.

- allied issues if necessary-irrigation, livelihoods

1 Monitoring, Data analysis and Governance

- Organization and transfer of data
  - who, what, when and to where?-data, alerts, reports.
  - technology-SMS vs. hand-held, databases
- Governance
  - taluka vs. central monitoring agency
  - more formal-at GP gram-sabha or panchayat samiti meetings
  - setting up accountability and response mechanisms
- GSDA data set-its analysis
  - mining, correcting, mathematical modelling

Research

- Technology generation: Transmission and Repository.
- Study of Unicef-GSDA data at pilot villages.
- Mining of GSDA data set.

Input and Assumptions

What decisions and choices precede the project?

- One key assumption is that the format and schedule of data, the quanitities to measured etc. are fixed outside this project. Thus, the project expects a table of the type:

Attribute	Frequency	Location From	Location To
Well level	Weekly	*Gudwan*	Repository
Summary Report	Monthly	Repository	Taluka office
⋮	⋮	⋮	⋮

- The second assumption is that actual physical locations of habitations, selection of wells, etc. are done outside this project. Thus, we would expect:

Point	Habitation	Location	Coverage
Borewell	Naldhe	19.7677, 73.1178	Mobile
Well	Gudwan	19.3456, 73.2231	None
⋮	⋮	⋮	⋮

- Documents and Reports on existing protocols, their designs, outputs, and so on and the cooperation of participating agencies.
- Overall administrative framework and a data flow and control flow matrix.

Arrangements

- As a CSE project and run by CSE engineering and design principles.
- CTARA, GSDA etc. as consultants.
- Core requirements
  - One Principal Engineer, 2 assistant engineers.
  - Finances of about Rs. 3 lakhs per month.

Salaries	1.2 L	Consultancy	1 L
Misc.+Eq.	0.2L	IIT Overheads	0.6 L

  - Start-up costs-2 computers, storage devices.
- Deliverables-designs, prototypes and implementations.
- Time-line: Phase I of 4 months.

2 SVS and MVS

- Eventually, success lies in the correct design and implementation of water supply schemes.
- Correct understanding of all issues important.

- Single village schemes
  - review of overall SVS framework-demand, tariff, capacity
  - GSDA and technical support are key input
  - weakness analysis-typically source
- Multi-village schemes
  - Will be increasingly needed-N. Karjat, E. Chiplun, S. Guhagar
  - weakness-institution, ownership, cost recovery
  - need expression and project initiation

Departments and Governance Protocols

- MJP-little delivery in rural systems
  - coordination with MSEB
  - All reservoirs being used up for urban demand.
  - MJP vision on wide-area rural needs
- Unreliable information at taluka level
  - about SVS and MVS performance
  - about actual scarcity

Konkan	
Urban	60 lakhs
Rural	3 lakhs

Research-Tool for MVS/SVS analysis

- Factor analysis for MVS and SVS schemes
- analysis of SVS schemes and need for MVS
- gathering of accurate scarcity in pilot talukas

The Tertiary problem

- The tertiary design seems critical for both the MVS and SVS.
- Development of this protocol of great importance.

Ground Reality

- Stakeholder identification
- Social/political differences
- Ability/willing-ness to pay
- Demand and Use pattern
- Seasonality, Differential QoS
- Existence of other sources
- others

Protocol $\Longrightarrow$

Design parameters for sustainability

- Technical system
- Institutions
- Tariff structure

The MVS and SVS flow

- Transaction and design of interactions-very important
- Handover-Institutional, Technical (operational), Financial.

	SVS	MVS
Demand Expression	GP, RDW	GPs, ZP
Design	RDW, GSDA	MJP, MSEB
Implementation	RDW, GP	MJP, GPs
Handover	RDW, GP	MJP, ZP
Sustenance	GP, TSP	ZP, TSP

Basic Methodology

Background Study 3-6 mo.

- MJP, taluka, GP, ZP-stakeholders.
- Existing norms, procedures, formats.
- CSOs, NGOs, Engg. colleges, etc.

Field Study 6-12 mo.

- Key stakeholder meetings
- Tools-design and execution

Analysis 3-6 mo.

- Assimilation of field work
- Recommendations and learnings.

Staged Outputs

- Institutional Framework and analysis
- Selection of field sites
- Multi-stakeholder narratives
- Project timelines
- Best practices
- Overall protocol design
- Conclusions and Recommendations

Arrangements

- Multi-stake holder-cooperation and buy-in essential.
- Run by CTARA-IIT Bombay and its staff and project employees.
  - 2 full-time engineers/development specialists
  - liaison with CSOs, NGOs, other colleges as field costs
- Net project duration -1.5-2 years.

Salaries	24 man mo.	0.3	7.2
Faculty Time	50 days	0.25	12.5
Fieldwork	20 days	0.2	4.0
Institute	20%	-	5.1
Total	18 mo.	-	30.8

3 Long Term-largely research

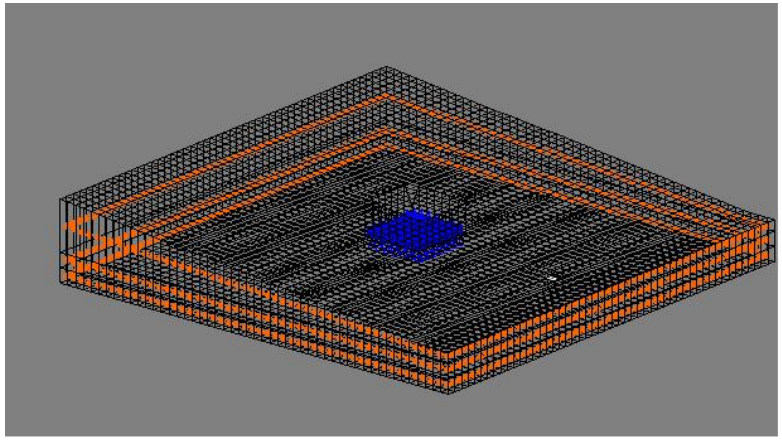
- Groundwater recharge and Surface storage
  - planning for larger structures for rural domestic use
- Watershed management and recharge
  - procedures, afforestation
  - modelling and simulations
  - quantitative analysis and cost-benefit analysis
- Regulation

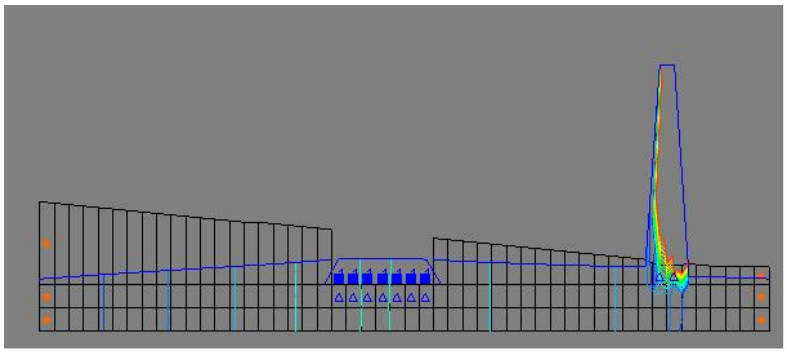
Hydrogeological Modelling

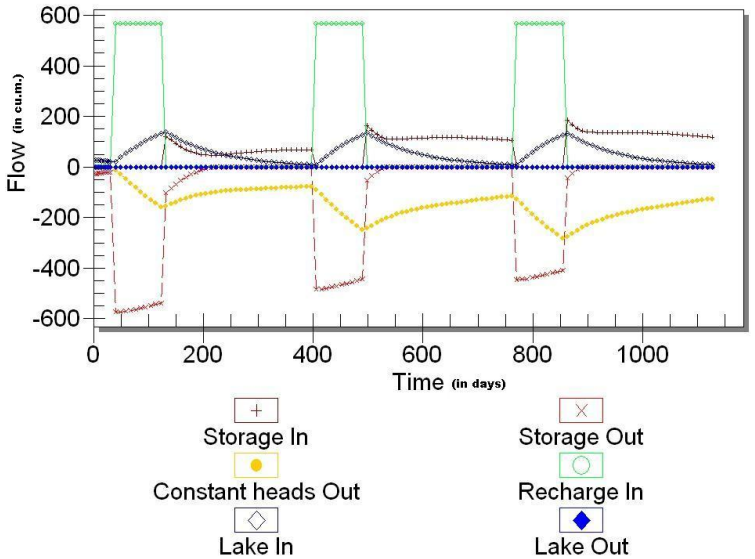
- MODFLOW based, largely saturated flow, but unsaturated planned.
- Open source, for watershed planning and parametrization use
- Seek GSDA collaboration.

Simulator Project- since 2008

- Role in watershed development.
- Planning of small structures for drinking water.







Thanks