The CTARA Technology and Development Supervised Learning

www.ctara.iitb.ac.in/SL.html
Outline

- Our mandate and knowledge generation
- An example—the Karjat pipeline project
- The Technology and Development Supervised Learning
  - Administering the TDSL
Mandate

- Nehru, *sentries of our country...*
- The IIT Review Committee of 1986: *extension activities* and *rural development*

http://www.education.nic.in/cd50years/f/G/J/0G0J0E01.htm
http://www.education.nic.in/cd50years/f/G/BookG.htm

- Increasing importance of primary experience, inter-disciplinarity and system-thinking
- **Development as an urgent need.**
  - malnutrition, drinking water, infrastructure, and so on
  - corruption, iniquity, social inequality, and so on
- Belief that this is within the purview of an institute such as IIT-Bombay
  - Knowledge generation for the direct benefit of society
- Influence of our engg. methodology to other colleges in India
A new paradigm at CTARA

- The bottom 80% : beneath the market and the state-an ideal laboratory!
- Core issues: food, water, energy, livelihoods, public health- simple principles and great returns!
- Delivery: designs, implementations, studies to a concrete beneficiary-the creation of knowledge!

- For good engineering-with development as a side-effect.
- HBS : ” start with the proximate customer” or
- Sam Pitroda: ” engg. as if the common indian mattered . . .”
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A New Contract: Engagement and the Engineering cycle

- Anjap-Sugwe drinking water scheme
- Malvan taluka transport plan
- Second crops in Dimbhe
- Waste management in Guhagar
An Example-The Karjat Project

- **Disha Kendra**: A popular NGO in Karjat-Khalapur area, led by Nancy Gaikwad.

- **January 2010**: approached CTARA with problem of widespread drinking water collapse in North Karjat taluka.

- **Their strategy**: RTI and *dharnas* at taluka office.
Our Plan

- Question 1: Is there adequate groundwater at all?
  - GSDA, our own tests. (Sanjiv, Vishal)

- Question 2: Are there administrative problems?
  - lack of information, improper yield tests, etc.

- Question 3: What is to be done?
  - Groundwater recharge structures?
  - Surface water supply? (Abhishek, Vikram and Janhvi)
The Karjat Pipeline feasibility study

Study Objective

Is it possible to have a wide-area rural pipeline scheme for the area?-a basic techno-economic feasibility study.

- use MJP norms exactly as far as possible.
- See if capital costs and energy costs fit within norms.

- Abhishek Sinha, Vikram Vijay: two dual-degree Civil. Engg. students, Janhvi Doshi, 4th year B.S., summer intern from Rice University.
- 3 months of field work: May-July 2010. Report-writing 1-2 months.
- Rs. 1 lakh budget.
Hamlets and clusters
Lots of nice optimization problems, use of simulators, GIS and so on.
Key Findings

<table>
<thead>
<tr>
<th></th>
<th>200 LPCD</th>
<th>40 LPCD</th>
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<tbody>
<tr>
<td>Daily Demand</td>
<td>19.47 MLD</td>
<td>3.90 MLD</td>
</tr>
<tr>
<td>Net Investment</td>
<td>Rs. 57.21 crores</td>
<td>Rs. 17.19 crores</td>
</tr>
<tr>
<td>Cost per person</td>
<td>Rs. 7051</td>
<td>Rs. 2119</td>
</tr>
</tbody>
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- Energy costs of Rs. 4.51 per cubic meter, at Rs. 5 per unit and 75% pump efficiency.
  - This may reduce further from better choice of lift-up point, agreement between MJP, Irrigation and Tata Power.
- O&M costs and establishment costs to be added.

Pipeline water supply for North Karjat (pop. 51,000 in 70 hamlets) is techno-economically feasible.

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1[www.cse.iitb.ac.in/~sohoni/karjatfinal.doc](http://www.cse.iitb.ac.in/~sohoni/karjatfinal.doc)
Post-report

- Report submitted to Disha Kendra for dissemination.
  - Key knowledge input to serve as rallying point.
- Report submitted to Karjat MLA, Shri. Suresh Lad.
- And to MJP office and Minor Irrigation office in Karjat.

Towards implementation:
- Report *adopted* by GPs.
- Formal expression of demand (scarcity) submitted to ZP and MJP.

New Research
- Single vs. Multi village schemes and institutional issues
- IIT as consultant to rural bodies
Outline

- **TD390 Study:**
  - Introduction to field work, multi-stakeholder projects and study.
  - Identification and formulation of problem
  - Bring formal analysis to the problem
  - A feedback loop and a report

- **TD490 Analysis**
  - Knowledge generation for a specific situation.
  - Independent inter-disciplinary inputs required
  - Formulating the key steps in the study and carrying it out
  - Stakeholder interactions
  - Drawing conclusions and report and presentation

- **TD491 Design**
  - Knowledge application with a creative component.
  - Clear objective, stakeholder participation and deliverable
Various design steps

1. What is the question and what is the expected deliverable
   - Guide input crucial here, see, e.g., www.cse.iitb.ac.in/~karjat/mvs.doc
   - background note, stakeholders, outline of the report

2. What is the narrative
   - should be done after key field visits
   - secondary data and literature, legal framework, govt. programs and documentation

3. What is the methodology—basic steps, their objectives and their design
   - basic tools, protocols and questionnaires, interviews, GIS, software, simulations, designs

4. What is the schedule
   - timelines, meetings, budgets and so on

5. What will be closure
   - reports, presentations++, outcomes, key stake-holder reporting

Basis for Grades
Submit document by Feb. 21st which addresses all issues, esp. items 1,3 above.
A few tips

- Are all the stake-holders counted?
  - Women? Even big companies, govt. agencies can be approached

- Re-examine your prejudices.
  - Govt. is corrupt. Politicians and contractor nexus.
  - many issues a matter of poor design

- Deal carefully with vested interests.
  - Use academic front, do not take positions. This is a study.

- We are engineers first and then social reformers.
  - Social mores as constraints for design. Keep a healthy distance.
  - See that you do not perpetuate inequity, vested interests and so on.

- Knowledge is the key output
  - Protocols and methods, devices. Honesty and hard work.

- Your learning and your creativity of primary importance
  - We are not consultants. Research can always be continued.

Finally: We at IIT are wise and have contacts! Talk to us.
Thanks!