Vision, Action and the Future

Centre for Technology Alternatives for Rural Areas
IIT-Bombay

Milind Sohoni

www.ctara.iitb.ac.in

Agenda

- Introduction to CTARA
- Core CTARA operational values and the T&D program
- Development situations
- Vision and the future

Centre for Technology Alternatives for Rural Areas

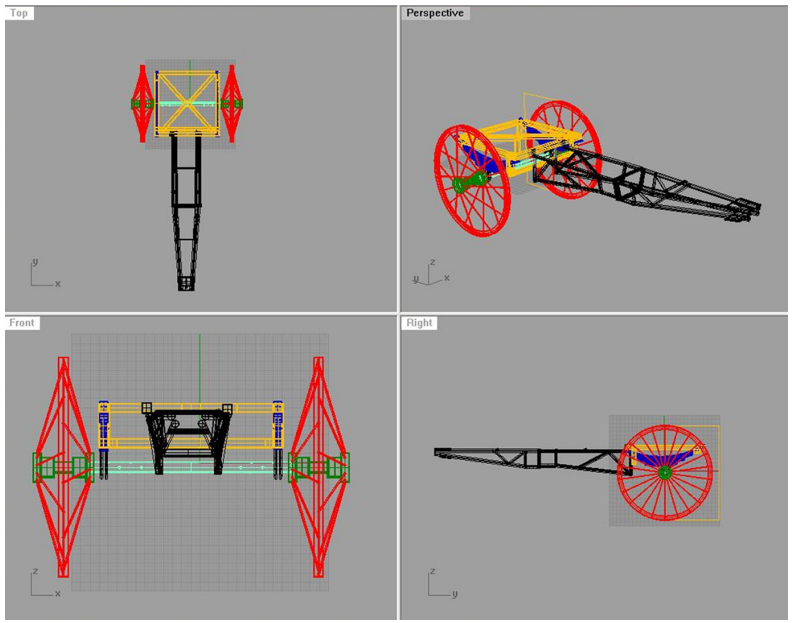
- An academic center of IIT-Bombay, started in 1985
- To study and to develop solutions for problems from rural India

Initial work:

- Agricultural machines and implements
- energy and drudgery saving devices

KVIC nodal center

- herbal oils extraction process
- Bio-diesel from waste oil



Later work

- 2005: Check-dam at Gudwanwadi, 85m, 20,000 cu.m. for Rs. 25 lakhs
- 2009: Vertical Shaft Brick Kiln at Pen *taluka*

Department	$\Rightarrow$	End-Use	$\Rightarrow$	Stakeholders
Civil, CSE	$\Leftarrow$	Drinking Water	$\Leftarrow$	Gudwanwadi

Academic Initiatives

- 2007: M.Tech. program in Technology and Development
- 2010: TDSL-interaction with other departments and UGs

Core Faculty

- A. W. Date-Appropriate Technology, Rural systems
- U. N.Gaitonde-Mechanical Engineering, Energy and Thermal system
- Anand Rao-Energy and Environment, Climate Change
- N. C. Narayanan-Water and Governance, Development Theory
- N. Shah-Food, Agriculture and Agro-Industry
- Milind Sohoni-Water, Rural systems

Adjunct Faculty:

- S. Wagle-Policy and Governance
- Bakul Rao -Environment Analysis and Assessment
- P. Modak -Environment and Natural Resource Mgt.
- S. Agnihotri -Governance and Govt. Programs

The T&D core operational values

- Concrete beneficiary/stake-holder-the bottom 80%, households, hamlets, gram-panchayats, villages, towns and cities
- Basic areas-soil, water, energy, livelihoods, public health
  - end-user defined or demand-driven
- Concrete deliverable-as close to implementation as possible
  - solutions and knowledge-technology, policy, study, capacity
- **Act locally and then think globally**

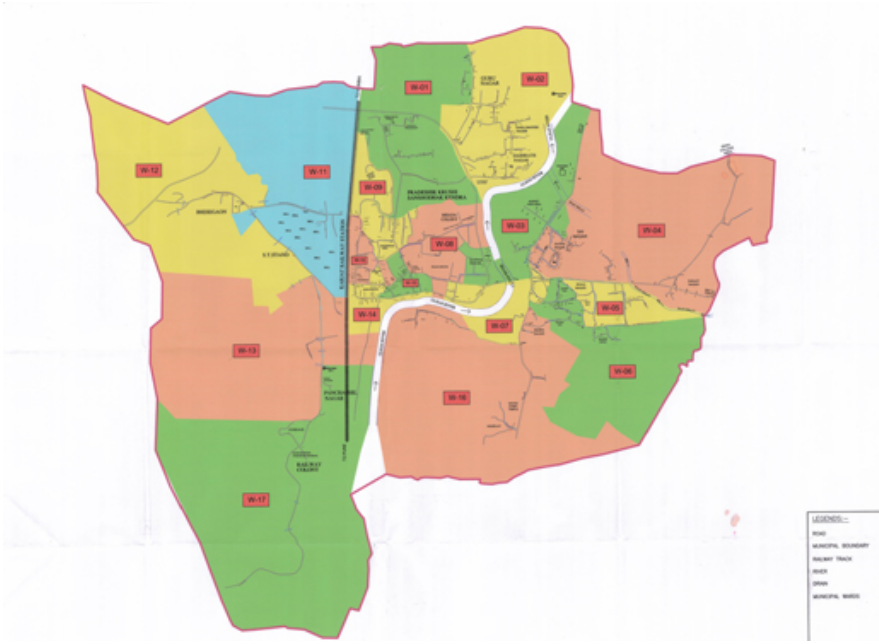
Objectives of the M.Tech./Ph.D. program

To produce the developmentalist/development practioner

- Analyse "development" situations and design solutions
- Build on grassroot understanding to work on national/global issues

Karjat City-a small taluka town in Maharashtra

- Request from Municipal Council to analyse City Development Plan
- Ongoing work-water, sewerage, solid waste, municipal budget
- Skills: GIS, simulations, social and governance analysis



water system

- 3 zones OK but higher capital costs, 1 zone poorly designed
- Pump efficencies lower (51% , 60%) than standard (70%)
- financial stress-unmetered system, commercial and residential
- competition with private bore-wells

Drinking water system for Boriwali GP (Karjat tal.)

As requested by Borivali Sarpanch.

Development problems demand:

- field-work and inter-disciplinarity
- creativity, innovation, honesty and hardwork

The corollaries

- Foremost learn the real Engineering loop: analyse, design, deploy, satisfy
- Accept Inter-disciplinarity-necessary and in the multi-stakeholder form
- Engage-with the unorganized sector, directly or through the State or the Market, if present. Through NGOs, CSOs
- Do Field work-sensitization, proofing, participative and beyond

Perspective

3-4 common courses

Skills

2-3 common courses

Knowledge

Domain coursework and electives

Practice

Fieldwork and delivery specifics

The current M.Tech./Ph.D. in T&D

Coursework

- Perspective-philosophical nuts and bolts
  `Development Theory, Appropriate Technology, Policy and Governance`
- Sectors-the knowledge base
  `Water, Soil and Agriculture, Energy, Environment`
- Skills-to bring rigour to field work
  `Social Sci. Res. Meth, System Dynamics, Project Mgt. and Analysis`
- Field work- 10 week structured rural stay, field visits
- Two-Stage Project-Ideally
  - Ist Stage-Situation and alternatives-Appreciation
  - IInd Stage-Technology or Policy-Generation

Our students (and our faculty) in the field

Our locations-*Naldhe*

At our 10-week field stay

Selected M.Tech. Projects

- Study and design of cages for aqua-culture
- Development of nutritional supplement for malnourished children
- Design enhancement and dissemination of improved cooking chulha in a village

- A process model for regulation in infrastructure development
- Analysis of groundwater regulation in various states of India

- Simulation of hybrid energy systems for village applications using HOMER
- Convergence of NREGS and Watershed improvement programs in Kerala
- Assessment of Herbal Initiatives in a Rural System

What after M.Tech?

What do we train them for-

- An initial stint with an NGO/CSO in a particular sector
- Or a company in the development sector
- An independent consultancy, business
- A Ph.D. in development subjects and teaching
- Advisor-ship, expert consultant to collectors, ministers, banks and agencies
- Leadership role in flagship NGOs, government, regulatory bodies, or independent Centers
- Corporate roles-new companies and new areas

OK-but what about starting with big companies?

What after M.Tech?

What do we train them for-

- An initial stint with an NGO/CSO in a particular sector
- Or a company in the development sector
- An independent consultancy, business
- A Ph.D. in development subjects and teaching
- Advisor-ship, expert consultant to collectors, ministers, banks and agencies
- Leadership role in flagship NGOs, government, regulatory bodies, or independent Centers
- Corporate roles-new companies and new areas

OK-but what about starting with big companies?

- Is there a big company delivering water to the bottom 80%?
- *Veolia*, a french water company with turn-over of $ 50 billion, started as a company to serve Lyon

Supervised Learning in Tech.and Dev. (TDSL)

- Unique opportunity for faculty members to float live development projects and for students to take them
- Guidance and Liaison from CTARA
- Objectives : extension, field study, entrepreneurship in the public space. Also pre-research

Course	TD390	TD490	TD491
Credits	6	6	12
Title	Study	Analysis	Design
Reporting	IIT	+stakeholders	+ stakeholder

- Since January 2011, 3rd offering-extremely popular– 13 students this semester, 30+ students overall

Sampler

- North Karjat Tal. Drinking water scheme -Design
- Rural Bio-gas Alternatives-Two case studies -Study
- The Anjap-Sugave multi-village scheme-a failure analysis-Analysis
- Transport provisioning in Karjat taluka -Study
- Incentives from Medical companies to retailers -Study
- Karjat City Development plan-Design

This semester-Thane district, Bio-gas, Slum Rehabilitation schemes

- Budding consultants, entrepreneurs, researchers-Opportunities in the development agenda

Some pictures

The Vision in Development Action

- IIT should be known for its excellence through delivery and engagement
  - known not for who gets in but what comes out
  - innovative and creative projects which deliver
- A pedagogy of engineering-colleges as local solution and knowledge providers
  - to develop courses, modules and projects
- An engagement and presence with government and implementation agencies, local bodies and civil society
- To intellectualize the role of the university/institute and to mediate on behalf of society

Foremost

To make engineering inclusive and social so as to deliver development

The TDCC-Consultancy Cell

- to respond to consultancy and knowledge needs of civil society
- to liaison between student output, stake-holders and delivery
- to position CTARA with implementation, govt, agencies and to develop thematic output
- to administer TDSL and to organize CTARA research output

Currently led by Pooja Prasad (B.Tech Chem., 2000) and an M.S. from Stanford. 8 years experience in logistics in Silicon Valley

- Grow as number of projects grow- 1-2 people needed soon
- Yearly reports on expenditure and value generated-first economic and eventually financial viability

What do we need?

- Field instruments-GPS, surveying, hand-held devices, meters
- Extension of environmental testing facilities
  - space and instruments for soil, water, air
- Space–office, laboratory, project staff and faculty
- TDCC–salaries? Housing–guaranteed for 3-4 people?
- Workshops and Meetings
  - dissemination and consultation
  - on NREG, design and analysis of piped water supply schemes
- Faculty : already two chairs -one in social and one in engg.
- Student Internships : Rice and now possibly Berkeley. Discussions with Brown and Columbia. Both back and forth

What do we need?

- Field instruments-GPS, surveying, hand-held devices, meters
- Extension of environmental testing facilities
  - space and instruments for soil, water, air
- Space–office, laboratory, project staff and faculty
- TDCC–salaries? Housing–guaranteed for 3-4 people?
- Workshops and Meetings
  - dissemination and consultation
  - on NREG, design and analysis of piped water supply schemes
- Faculty : already two chairs -one in social and one in engg.
- Student Internships : Rice and now possibly Berkeley. Discussions with Brown and Columbia. Both back and forth

Perhaps.. Broadbasing extension within IIT

Shift in alumni focus from IIT's infrastructure to *deeper waters* – IIT's role and vision and direct participation in the national agenda

Thanks