Severe stress in key areas
The basic argument
(CM meeting, 23rd March, 2015)

Maharashtra’s Development Demands
Civil amenities (water, energy, transport etc.), livelihoods, SMEs

Need for Knowledge, New Practices, New Research
New Job Profiles, Avenues for Professionals

The role of University and Higher Education
Knowledge Structures, Research in Key Areas
Government Resolutions by GoM

GR-Water and Sanitation

Allows CEO of each ZP
- to select an engineering college
- Assist in analysis of rural water supply schemes
- Improve processes of design and planning
- Provides for data and fees
- TDSC already using it to analyse 4 schemes in Thane district
Unnat Maharashtra Abhiyan

GR - Attempt at broad reform of HTE institutions

Objectives

- Reform teaching, curricula and research
- Train future professionals and align with development objectives
- Make institutions regional resources
- Provide mechanism for citizens to approach institutions
- Provides for data and fees
Mechanism

At DTE

- Advisory Committee: heads of institutions, Director (TE) and directors of other arms of GoM
- Head (CTARA) ex officio-CTARA as mentor
- UMA cell within DTE to run the show
- Training programs and meetings

At Institution

- **Case-Studies** as key mechanism- water, energy, urban and rural planning, public transport, MSNA, JYS, MGNREGA
- Curricula reform and space for projects and research
- **Technology and Development Cell (TDC):**
  inter-disciplinary cell to (i) receive demand. (ii) make ToR (ii) liaison with Collector, (iv) carry out project, (v) report
UBA Goals

- Introduce the development agenda within academic discourse and processes
- Inculcate a methodology of field-work and interdisciplinarity in academic processes
- Make higher education institutions as regional knowledge providers for regional problems
- Improve development outcomes such as sadak, bijli, pani through better knowledge
- Inculcate a scientific thinking within society, esp. about development
UBA, UMA and the Big Picture

- Phase I: IITs/NITs to adopt villages
- No funding! Institutions to access National and State Programs.
- Confusion on how to do this. Sector-wise attempt and plead to MHRD.
- Disinterest in senior IIT administration.

- UMA-TDC important mechanism!
CTARA programs and entities

MTech & PhD programmes

Training of IITB students: exposure to the development space, tools, protocols and skills

Delivering solutions: knowledge inputs required to directly address the basic needs of the bottom 80%

TDSL
TDSC
UBA
Rutag
Past TDSL topics

- Design of watershed interventions
  - Drinking water security assessment
  - Brick making practices and interventions
  - NREGA analysis
  - Understanding public health systems
  - Design of piped-water supply schemes
  - Analysis of sewage mgmt. techniques
  - Survey and analysis of bio-gas plants

- Electricity supply monitoring
  - Documenting pottery making techniques
  - Oral histories of peoples issues
  - Chulla dissemination and cooking practices
  - Economic analysis of weekly markets
  - Techno-economic analysis of poultry farms
  - Village-level environmental planning

- Agro-based industrial Development
  - Water sources status mapping
  - Soil and agricultural practices
  - Low-cost pulse recorder
  - Analysis and design of solar based pumping systems
  - Failure analysis of water schemes

- Low-cost power meters
Background on TDSC (IITB's TDC)

• Technology and Development Solutions Cell

• Formed: January 2014

• Deliver solutions and consultancy outputs for development projects

• Current team:
  – Puru Kulkarni, Milind Sohoni, Raj Desai
  – 4 civil engineering graduates

• www.ctara.iitb.ac.in/tdsc
TDSC Projects

Agreements signed with:

- Parbhani Municipal Corporation
- Thane district CEO
- Palghar district Collector

Other stakeholders:
- Aroehan (NGO) and Siemens CSR
- Sir Tata Dorabji Trust

Watershed interventions at the village-level (Mokhada)

Leakage and energy analysis of urban water supply network (Parbhani)

Analysis of failed rural water supply schemes (Thane district)

3rd party assessment of Jal Yukt Shivar (Palghar district)
UMA-UBA-TEQIP cell

Supply guidance to GoM/UMA

- Guide policy and UMA cell
- Visit institutions, install TDC
- Handhold in project cycle
- Share case-studies
- Train through CEPs-CTARA, HSS, Civil, Energy

- 3 positions-TEQIP/KITE, UBA and UMA.
Rs. 18 lakhs p.a.
TDSC-crucial role model
Graduates as consultants/innovators

- Expand role from 5 to 20-30 projects, sectors
- Stronger connection with academic and research programs
- TDSL inadequate-needs strengthening
- BTPs/MTPs need more flexibility
- Key faculty mentors across departments with shared objectives/vision

- Senior Dean/CEO position to manage
Thank you
# Challenges: Several Elephants in the room

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<tr>
<th>Poor understanding of the development agenda within the IITs/IISERS/NITs</th>
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<tr>
<td>Cooking energy, drinking water, sanitation etc. require the highest amount of intellect and rigour</td>
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<td>The road to global excellence is through solving concrete problems</td>
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<th>Incentives going the wrong way</th>
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<td>Institutions: No accountability other than holding JEE/GATE and writing papers</td>
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<td>Faculty: Easier to publish and present in Hong Kong than to work in a district. <em>And it counts!</em></td>
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<td>Students: Few go to Indian engineering. Very little training/research related to Indian situations.</td>
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Way Ahead

• Create space in current academic programs for inter-disciplinary development engineering.

• Develop case-study model as valid academic and research output. Start a Development Engineering Section on *Sadhana* and *Current Science*

• Allow for cross-disciplinary faculty and create intermediate and adjunct positions

• Reform TEQIP to enable collaborations with regional colleges on development agenda

• *Create engagement opportunities between state agencies and academia*