

# Development and Extension Work

## The need for developing metrics

Milind Sohoni, CTARA



# Outline

Item: Request to the Dean(R&D) to formulate metrics to measure extension and development work.

- Development work, Extension and Consultancy.
- The Nayudamma Committee Report and others
- The role of research papers
- An example of development work
- Towards metrics

# Development, Extension and Consultancy

- **Development work**-many definitions.
  - ▶ Bottom 80%, core issues-food, water, livelihoods, health.
  - ▶ MDG goals, development indices
  - ▶ Concrete deliverable, ... *make a difference* ...
- **Extension**-Horizontal transfer
  - ▶ informed by and delivers to society at large
  - ▶ *Wastewater treatment plants*-Prof. H. S. Shankar
  - ▶ *Vertical Shaft Brick Kiln*-Prof. A. B. Rao, Prof. U. A. Bhandarkar.
- **Consultancy**

Difference-**Goal setting and access to output.**

- *Development work and extension*-largely by academia interpreting social needs and delivering in the public domain.
- Fosters open discussion and democratic values.

# The Nayudamma Committee Report of 1986

The Visitor of the Indian Institutes of Technology at Kharagpur, Bombay, Madras, Kanpur and Delhi in accordance with Sub-Section 9 of the Institutes of Technology Act empowering him to appoint a Committee to review the work and progress of the IITs has appointed a Reviewing Committee for all the five IITs with the following terms of reference:

- (a) to review the present progress in fulfilment of its broad objectives as a centre of advanced studies and research in science, engineering and technology.
- (b) to examine how far the Institutes have interacted with other technical Institutes with particular reference to courses of study, programmes of research and faculty development.
- (c) to assess the overall impact of the Institutes on the training of high grade engineers for the technological development of the country.
- (d) to recommend the lines along which IITs should be further developed for advanced studies and research taking into account the developments ...
- (e) to report on any other aspects that are relevant to overall functioning of the Institutes.

## From the preface

Second, despite the general expectation that all national institutions will contribute specifically to the development of our predominantly rural economy, an ambivalent attitude seems to persist in the IITs in this regard, based perhaps on the commonly held belief that technology was relevant only to large-scale manufacturing industry.

Whilst this may be true in the case of developed countries where industry has the dominant share in the national income and the basic necessities are available to the entire population, our situation is substantially different.

It is clear that given the right orientation, high technology not only can but must contribute to improving living conditions, to making traditional vocations more efficient and to imparting knowledge, in our countryside.

# Goals and Tasks

(8) Amongst the goals and tasks of these institutes in their process of development have to relate continuously to: -to survive on specialisation, work increasingly in front line areas that transcend disciplines; - To have a perception and a value system appropriate to the pursuit of high engineering science to meet the critically evaluated needs of the society; - To programme into their activities emerging technological needs with a futuristic outlook; - to accept extension and public service as a third dimension to their role in addition to education and research; - To attain a stature that enables them to provide leadership with credibility. They should be the "think- tank" for higher technological education; - To aim at preparing more of creative engineers, innovative thinkers and engineer entrepreneurs; - To develop a special nexus with rural development mainly by way of involvement in technology-based solutions for problems in rural areas;

# More

To summarise: The Indian Institutes of Technology (should) academically

- strive to be relevant and excellent;
  - engage themselves in teaching, training, research, publication and extension work of relevance;
- (more points ahead)

Application of Science and Technology solutions to rural problems can be as exciting as they are in an industrial situation or in pure research area, and the results could benefit far greater number of people. It is important that IITs must increase their sensitivity to the problem of their environment and relate their activities more and more to indigenous problems with a view to obtain solutions through the application of technology.

## In conclusion

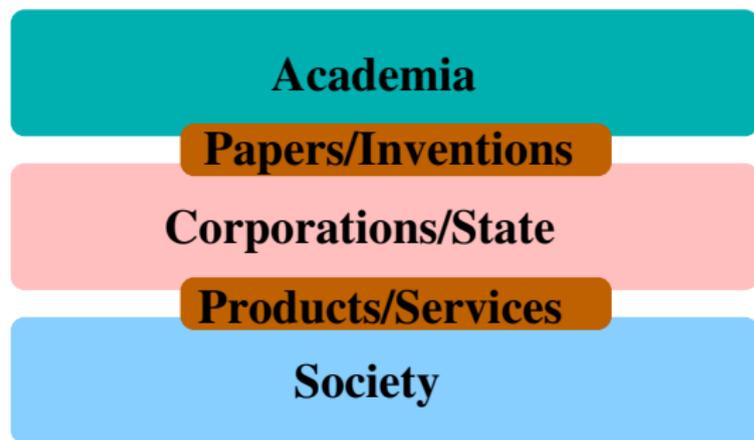
Piecing together this and other documents such as *The Technology Policy Statement (1983)*, IITs must include:

- **Goals:** Societal Impact-national development, rural development.
- **Pedagogy and Methodology:** Extension work and its suitability and excitement. Importance of field and primary work.
- **Notion of research:** Difference between us and the developed world.

### Clear Need-CRITICAL PROBLEMS

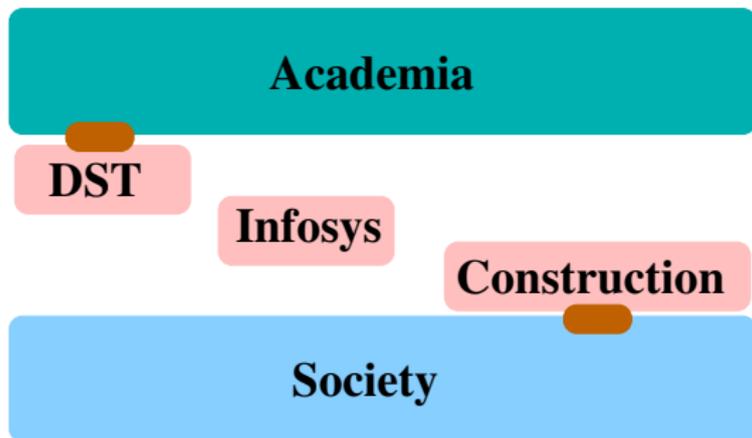
- How are we to incentivize extension and development work?
- How are we to measure societal impact of our current research output?

# Research and Society in the Developed World



- A mediating layer between society and academia.
- Layering of academia itself into extension, training and cultural institutions.
- **Research papers: possibly a good measure of societal impact.**

## ...while in India



- Very few entities interacting with both.
- Society highly diverse with distortions in access to opportunity.
- **International Journal papers**: solving other people's problems?
- **Drinking water** : a solved issue in the developed world.

# 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.

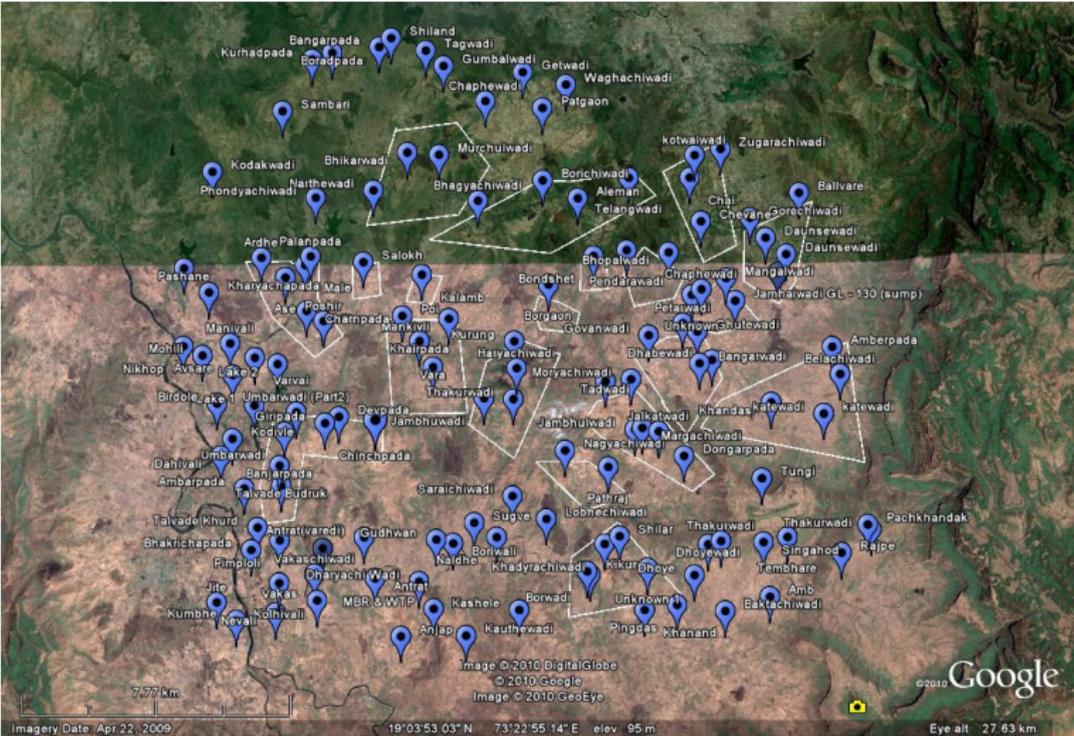
# The Karjat Pipeline feasibility study

## Study Objective

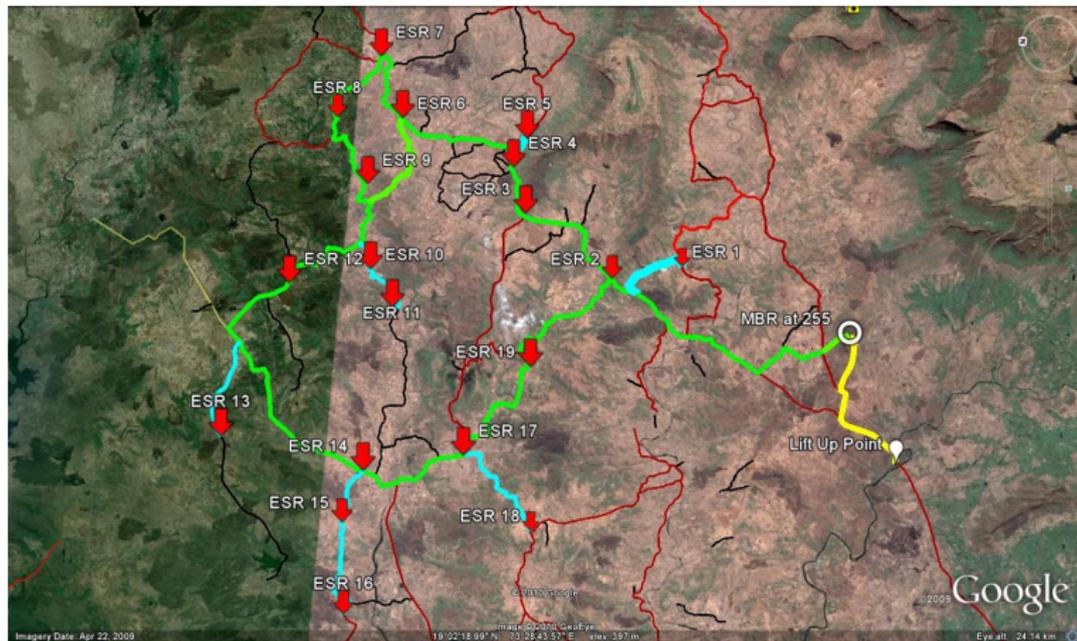
Is it possible to have a wide-area rural pipeline scheme for the area?-a basic techno-economic feasibility study.

- use MJP norms *exactly* as far a 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



# Overall map



Lots of nice optimization problems, use of simulators, GIS and so on.

# Key Findings<sup>1</sup>

	200 LPCD	40 LPCD
Daily Demand	19.47 MLD	3.90 MLD
Net Investment	Rs. 57.21 crores	Rs. 17.19 crores
Cost per person	Rs. 7051	Rs. 2119

- 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.*

# 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**

# But is this publishable?

- I think so, but most participants did not think that as important.

## The Crux

- Extension/development work-- a creative response
- For many, the returns of doing it are itself enough.
- For most, metrics are important.

# But is this publishable?

- I think so, but most participants did not think that as important.

## The Crux

- **Extension/development work**-- a creative response
- For many, the returns of doing it are itself enough.
- For most, metrics are important.

## New Directions and new methods

- Development work: important activity that IIT must do
- Critical problems and a new methodology of doing primary work--**requiring innovation from both faculty and students**
- Correct incentives for such work will be very important--**esp. for departments like CTARA.**
  - ▶ **Development as a subject**
  - ▶ **Development as an activity**

