

Leveraging India as India Stands up

through Innovations in Technologies, Business models and Policies

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Changing India

India has billion people, but...

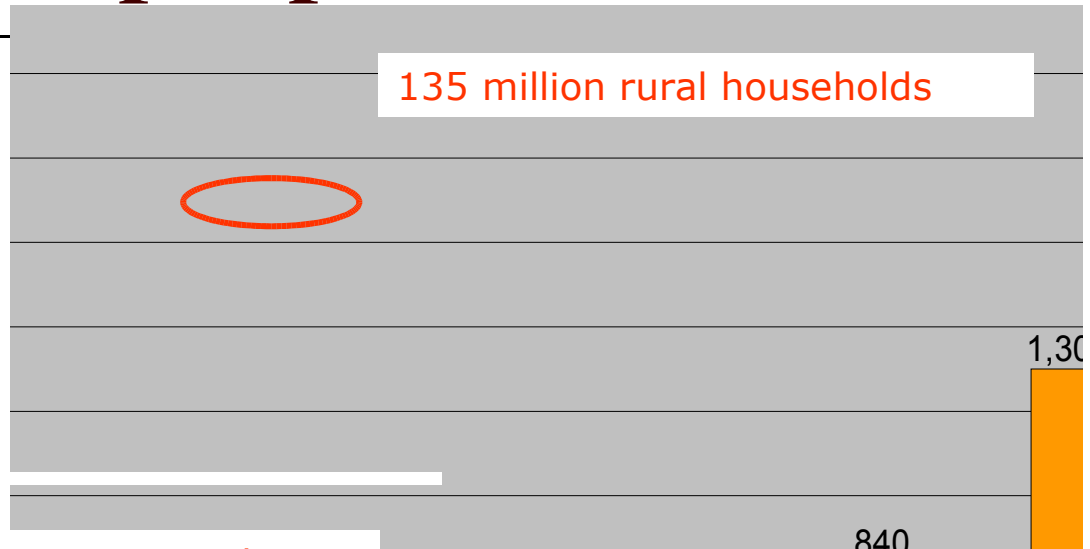
Affordability
is the key

65 million urban HH in India

135 million rural households

1,300

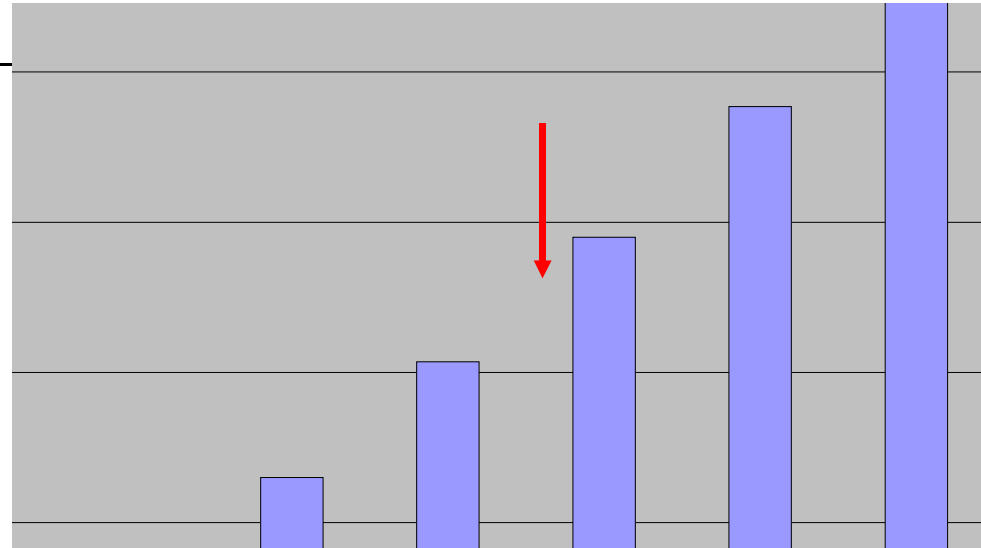
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Mobile Market in India boomed

5 million \Rightarrow 50 million \Rightarrow 150 million \Rightarrow 400 million

TENET
IIT Madras



- ◆ Not until Mobile Infrastructure Capex < US\$ 100 per line
 - ◆ and with handset price of \$ 50 onwards
 - ◆ service available at 2 cents per minute
 - ◆ ARPU of about US\$ 7
 - ◆ 5 million subscribers added last month



- ◆ Just Like number of TVs in India rose from 10 million to 100 million in 90's when prices became \$50 onwards and cable TV tariff fell below \$2 per month
 - Number of TV channels boomed
 - Entertainment industry in India one of the biggest

Airline Industry

- ◆ Is booming in India
 - ◆ doubled its passenger carrying capacity in two years
 - ◆ Average tariffs have fallen by more than half making it affordable to middle class Indians
 - ◆ In spite of rising petrol prices

The only limitation to growth is the airport infrastructure

-
- ◆ Growth of IT and IT enabled services is legendary
 - ◆ Crossed \$28 billion this year
 - ◆ Likely to reach US\$ 50 billion revenue by 2008

The World is Flat

But you aint seen nothin yet

for the changes has not yet touched Rural India



The not so visible

Engineering Education

- ◆ 400K engineering students graduate every year from 1500 engineering colleges
 - ◆ Up from 25,000 in 100 schools in early eighties
- ◆ Uneven quality is a major problem
 - ◆ was foreseen and resulted in reluctance to expand

But it is this human resources which has driven growth

“Our politics is obstacle to growth!”

- ◆ License fee bids in 1994 was astronomical
 - ◆ Operators soon found that they were chasing a mirage
 - ◆ Privatization was caught in legal quagmire

- ◆ Democratically elected Government changed the ground rules completely in 1999
 - ◆ Agreed to forego the large license revenue
 - ◆ And entered into revenue share agreements with NTP99
 - ◆ Quite unlike what European Governments were able to do with 3G license

We make plenty of mistakes, but we correct them in nick of time

Innovation

The Story of **TeNeT Group**

Incubating Entrepreneurs in a University

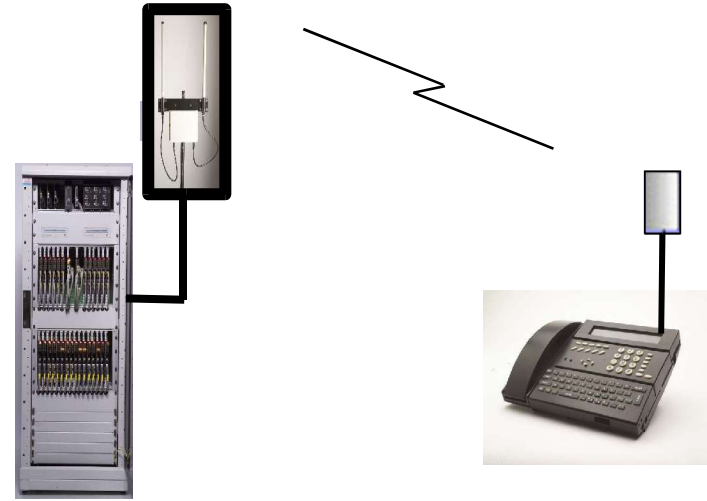
Balancing Economic Growth & Social Development

A group of 16 faculty members at IITM and about 14 companies incubated or nurtured by it with about 1400 engineers

TeNeT Learnings

- ◆ Successful Business is the best way to drive **development dreams** of a country
 - ◆ Let entrepreneurs flourish
 - ◆ Examples:
 - ◆ Entrepreneur lead PCOs (STD) brought in telephony to 300 million middle and lower middle class Indians
 - ◆ Local Cable TV operators brought in cable connection to homes at US\$2 per month
- ◆ India is a large market at the right price point
 - ◆ Nirma, sachet shampoo

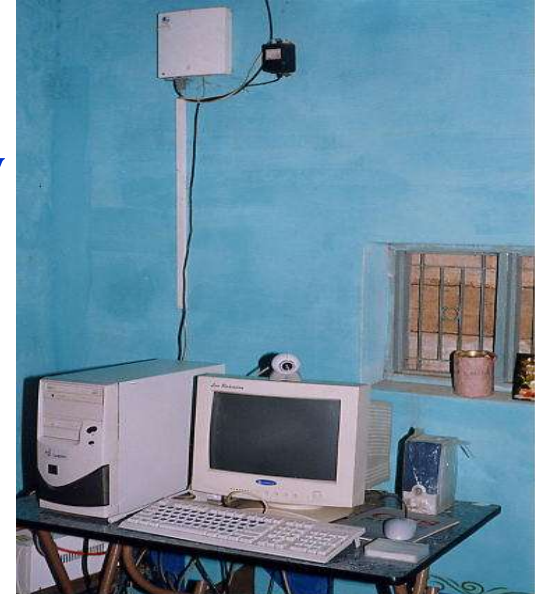
1994TeNeT Vision:
Connect India with 100
million telephones



Identify Local Loop Capex as
primary bottleneck:
Incubate **Midas**: help develop
Wireless in Local Loop
technology

- ◆ 2005
 - ◆ India crosses 100 million telephone lines
 - ◆ corDECT WiLL sales cross US\$ 200M (Rs 1000 Crore)

Rural India has 700 million people in 600,000+ villages with per-capita income of **US\$0.50 per day**

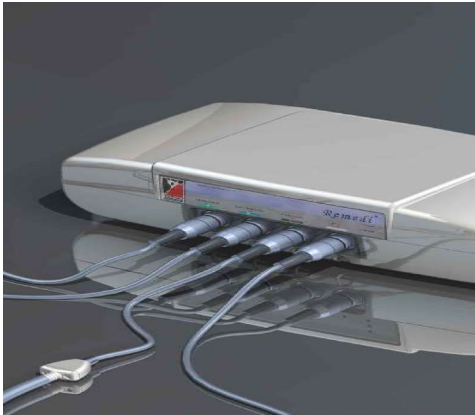


TeNeT 2001 Vision:
Connect every village
of India

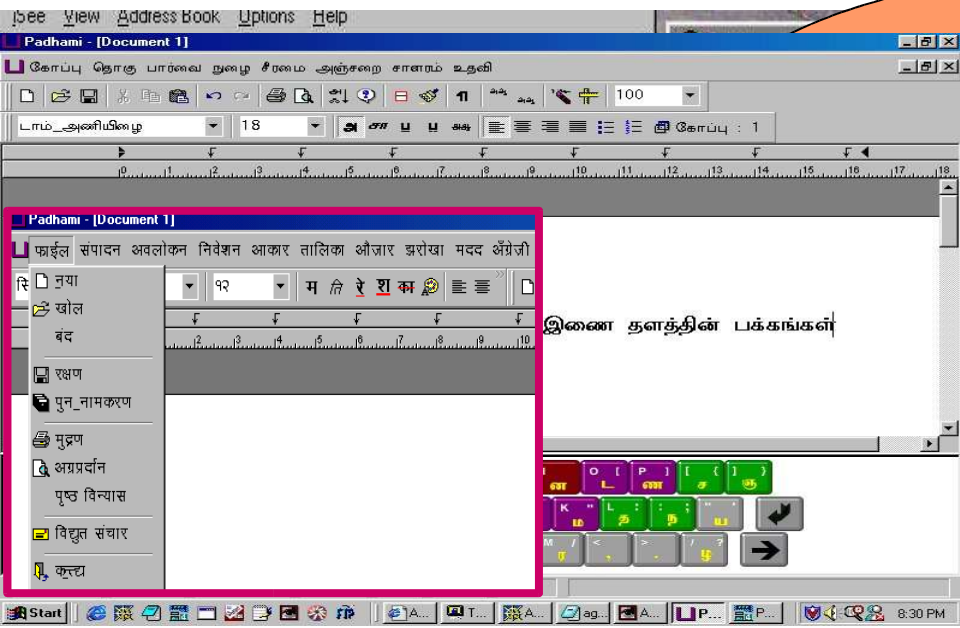
n-Logue focuses on
Internet Connection to each
village and drive education,
health and microenterprises
Double per capita
Rural GDP using ICT

- ◆ aggregate a village demand into a kiosk owned & driven by a local entrepreneur
 - ◆ **US\$ 1200 (Rs 55,000) Kiosk**

TeNeT Vision:
Double per capita
Rural GDP using ICT



CK-Shakti creates a Indian
language Office package



Outsourced Production enabled by Internet

◆ Embroidery for Life

- ◆ Women embroiderers trained by designer entrepreneur in villages
- ◆ An emerging business model for entrepreneur and kiosk operator

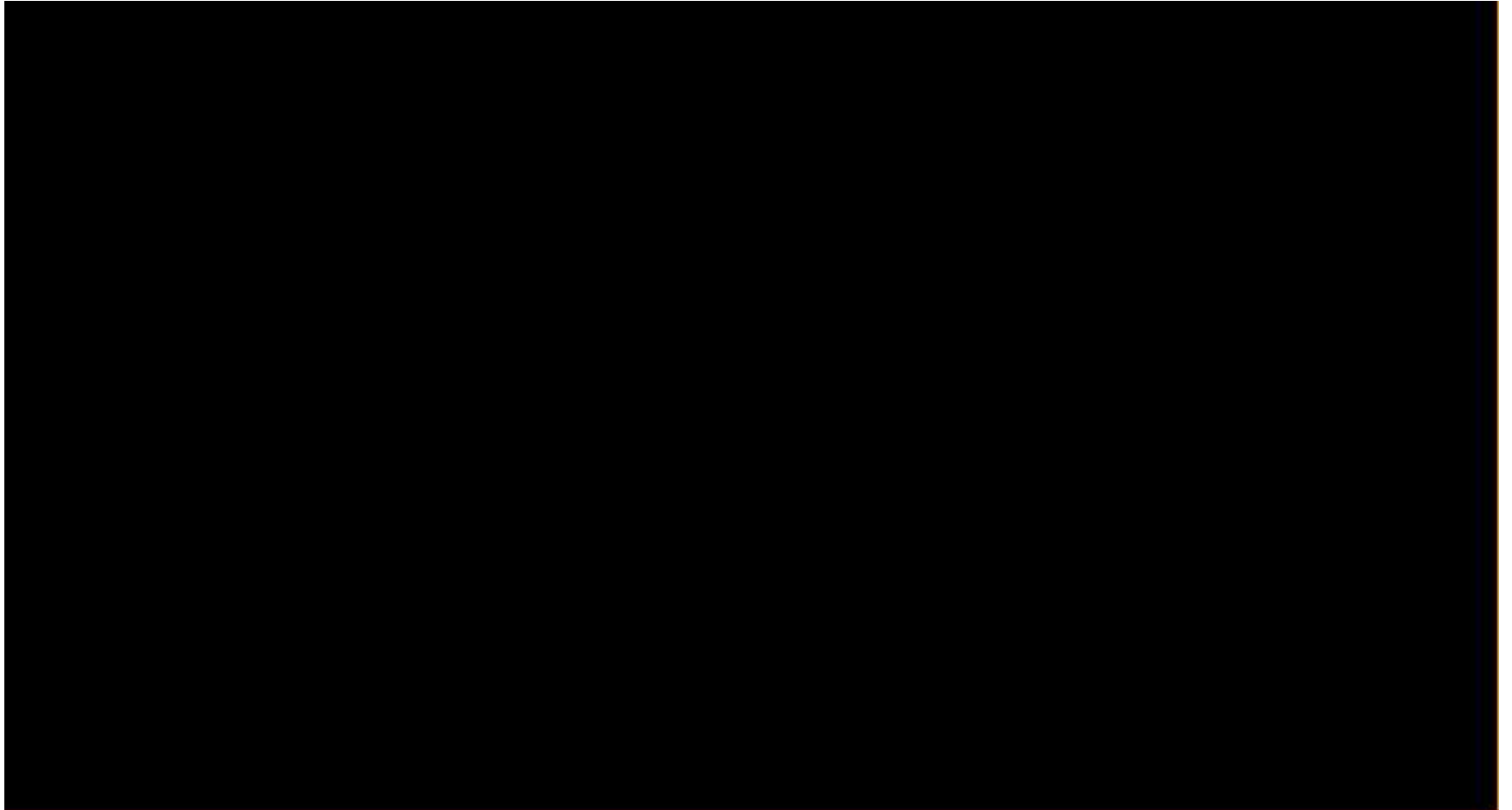


◆ Bags for Life

- ◆ Training in handmade paper bag, organizing production, quality control
- ◆ Quality products for the domestic and export market



IT Enabled Services at Rural kiosk



50 Million Broadband Connections in India by 2010

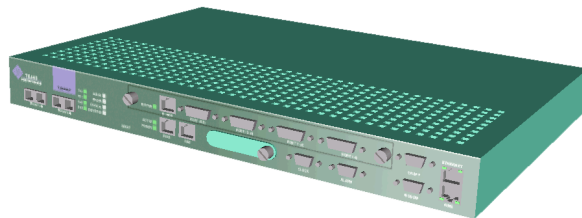
- ◆ Midas drives the Broadband connectivity Solution
 - ◆ From wireless, DSL and cable wireless
 - ◆ Introduces disruptive technologies like Cable wireless leverages existing coax infrastructure

- ◆ Novatium introduces NetPC at US\$ 80 plus monitor
 - ◆ Lower maintenance as all data stored in servers

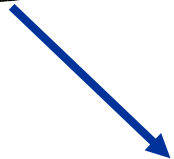


As Telecom Product companies in West Recede

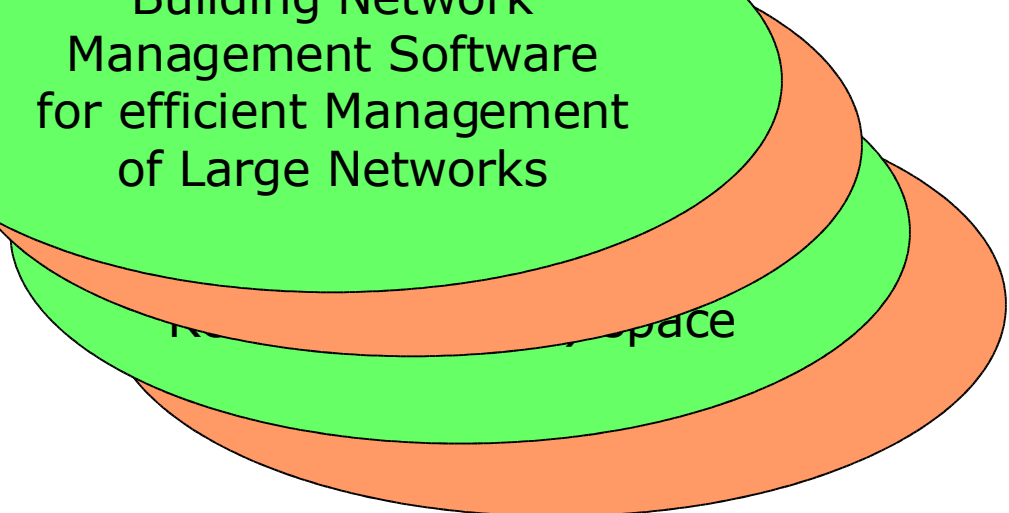
- ◆ and as Chinese companies try to fill in the void
- ◆ Imperative for India to build Billion Dollar product companies
- ◆ Midas and Tejas (with leadership in Optical Products moving towards such dreams



Aggregating
companies: Telecom
Products and Applications



NMSWorks
Building Network
Management Software
for efficient Management
of Large Networks



Network Space

Can India become

- ◆ Technology leader in one or two areas?
- ◆ TeNeT helps India Create a public-private Partnership toward leadership in Wireless Technology
 - ◆ Center for Excellence in Wireless Technology (CeWiT)

IITM Research Park

- ◆ IITM in process of building 1 m sq ft Research Park
 - ◆ for industry to work closely with IITM
 - ◆ Towards technology Innovations
- ◆ Modeled on Stanford Research Labs





Leveraging this Changing India

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- ◆ 20 million children in India ready to enter schools every year
 - ◆ Very small number of good teachers
 - ◆ Poor infrastructure in schools
 - ◆ Large drop-outs



Can technology be used to help overcome the shortcomings and train all the children?

Not a issue of selling operating systems, computers

-
- ◆ Can ICT be used to significantly enhance
 - ◆ college education
 - ◆ engineering and management education
 - ◆ skill training
 - ◆ entrepreneurship training

in absence of sufficient number of quality
trainers / teachers

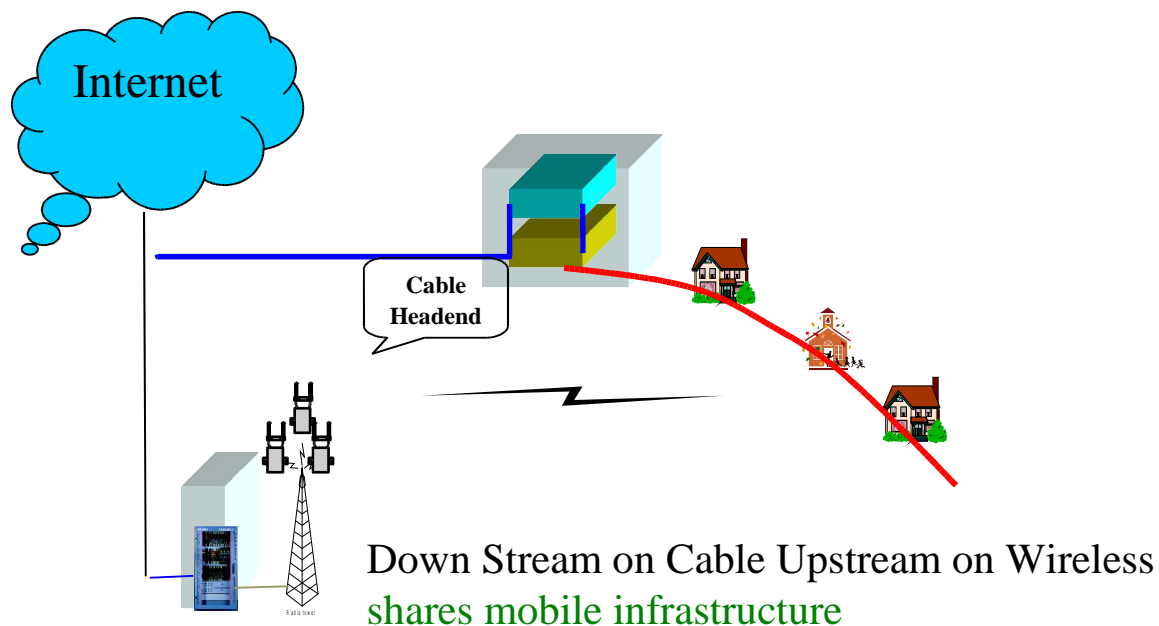
Make India a Product House

- ◆ Conceptualize, build and drive new products from India
 - ◆ use India talent
 - ◆ use Indian academia

- ◆ Develop products for Lower Income Emerging Markets like India
 - ◆ Conceptualize and develop them in India
 - ◆ Capitalize on Indian talents and low costs

Help drive dreams like

- ◆ 50 million Broadband connections by 2010
 - ◆ Cable Wireless Innovation for Connectivity
 - ◆ Network PC



Can one develop technology and programs which would leverage this connectivity to strengthen India, in turn driving this dream

and Dreams like

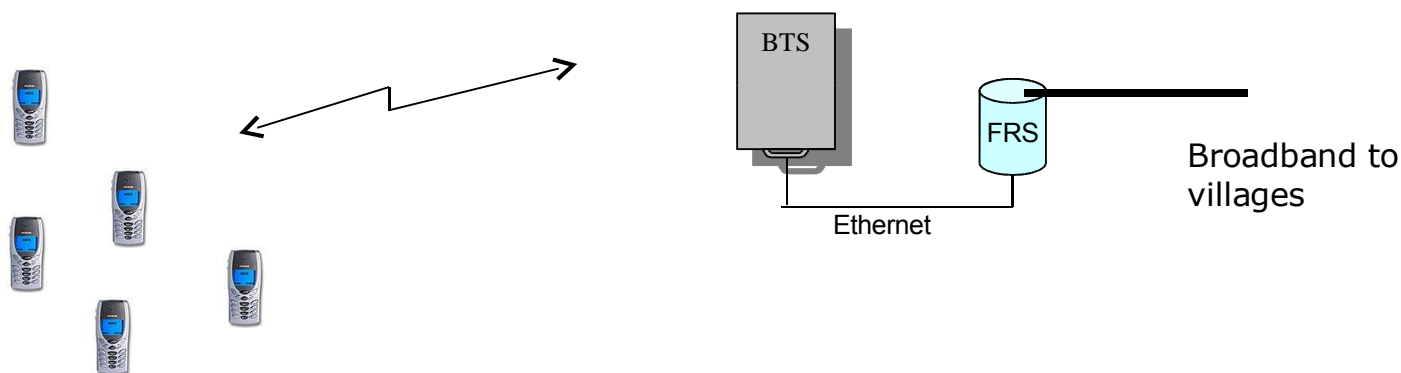
- ◆ Double per capita Rural GDP in ten years
 - ◆ Ten or more Micro-franchise and micro-enterprises in each village employing 10 to 15 people each
 - ◆ Can ICT help bring in the required finance, knowledge, training and support, buying, selling and logistics and risk mitigation

Will require 25 KVA to 100 KVA decentralized power plant in each village operated by a local entrepreneur

- ◆ Bio-diesel, crop-residue, biogas, solar

Using Innovations like

- ◆ Rural GSM Base Station in each village
 - ◆ Enables differential tariff for phones registered in the village and making calls from the village
 - ◆ Enables Rural affordability to not affect urban ARPU



National Rural Employment Guarantee Scheme

- ◆ 100 days guaranteed employment to one member / rural family
 - ◆ Can eliminate hunger
 - ◆ Can build Rural Infrastructure
 - ◆ Can add significantly to Rural Income
- ◆ **But only if we can contain corruption**
 - ◆ Can technology be used for this?
- ◆ An ATM in a mobile van at each worksite once a week
 - ◆ Can take project photographs
 - ◆ Image processing to assess progress in work and correlate to payments made
 - ◆ Make payments directly to villagers
 - ◆ Using finger print authentication
 - ◆ Collect database of each family
 - ◆ Ensuring distributive justice

To Conclude

- ◆ India is changing rapidly
- ◆ We need to dream big and then work hard to realize these dreams