Indo – US JCM

23-24 June 2010

Advanced telecommunications and Broadband Knowledge Networks in India

Presented by

Prof. S. V. Raghavan

ICT and India

* Ernet and Nicnet
* BSNL
* Reliance, Airtel, Tata Comm
* RailTel and PowerGrid
* ~250 ISPs
* Fiber to all Districts (Provinces)
* Fiber to Villages under Progress

Broadband

* 2 Mbps fast becoming the minimum speed
* Fiber to “Key” users is the Mantra
* GiGE (aka Gigabit Ethernet) is very popular
* Many service providers (TSP and ISP) have the capacity or in the process of building
* TSPs and ISPs still think of maximum speed as 10 Gbps

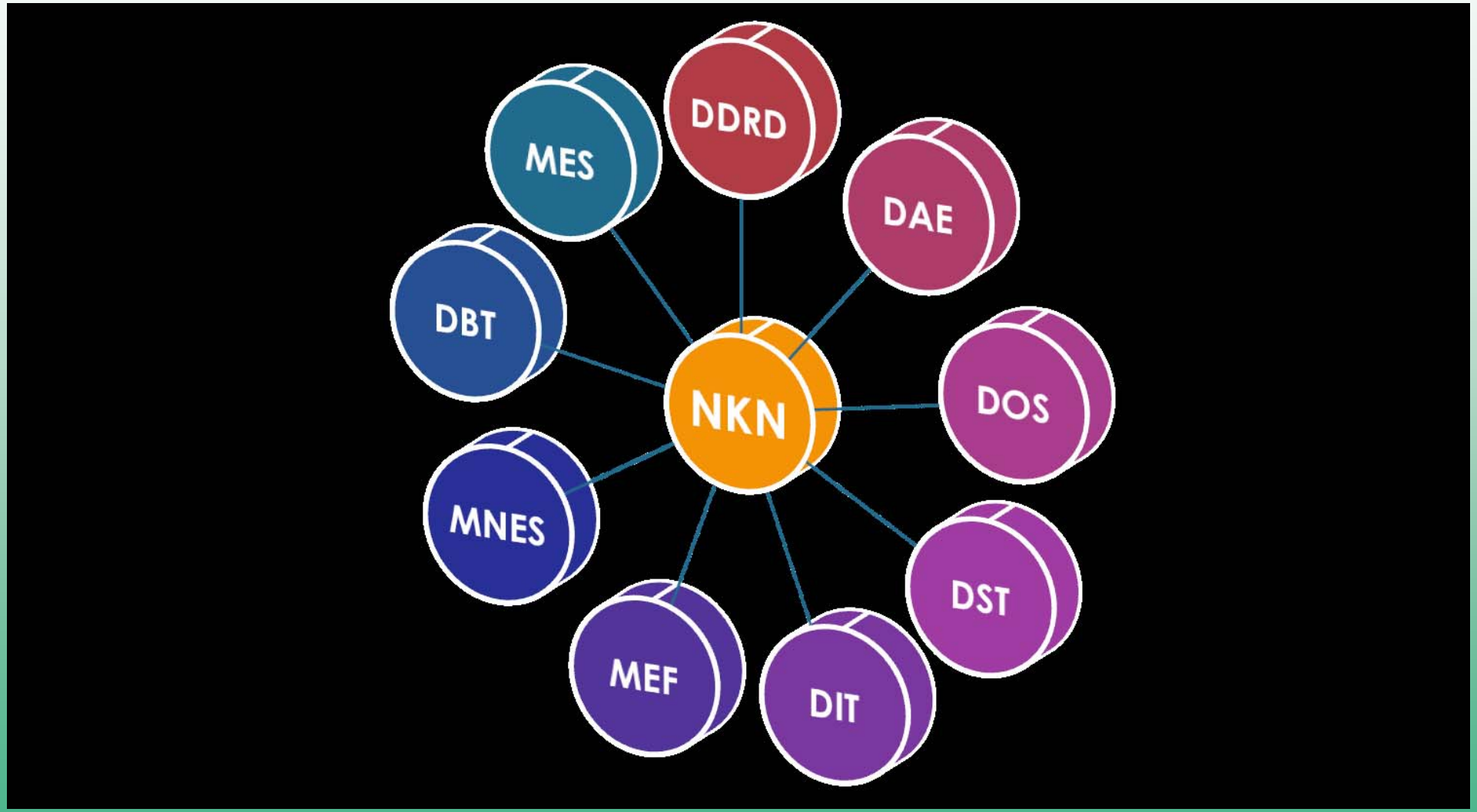
Research in India

* Basically centered around IITs and IISc
* Some leading Universities are also part of it.
* Very good understanding from Physics, Optics, Transmission, Modulation, Coding, Devices, FPGA based solutions, Data and control stacks, Open source, Large Scale Design and simulation, Collaborative engineering design, Infrastructure creation, and so on.

S & T Reseach and Synergy

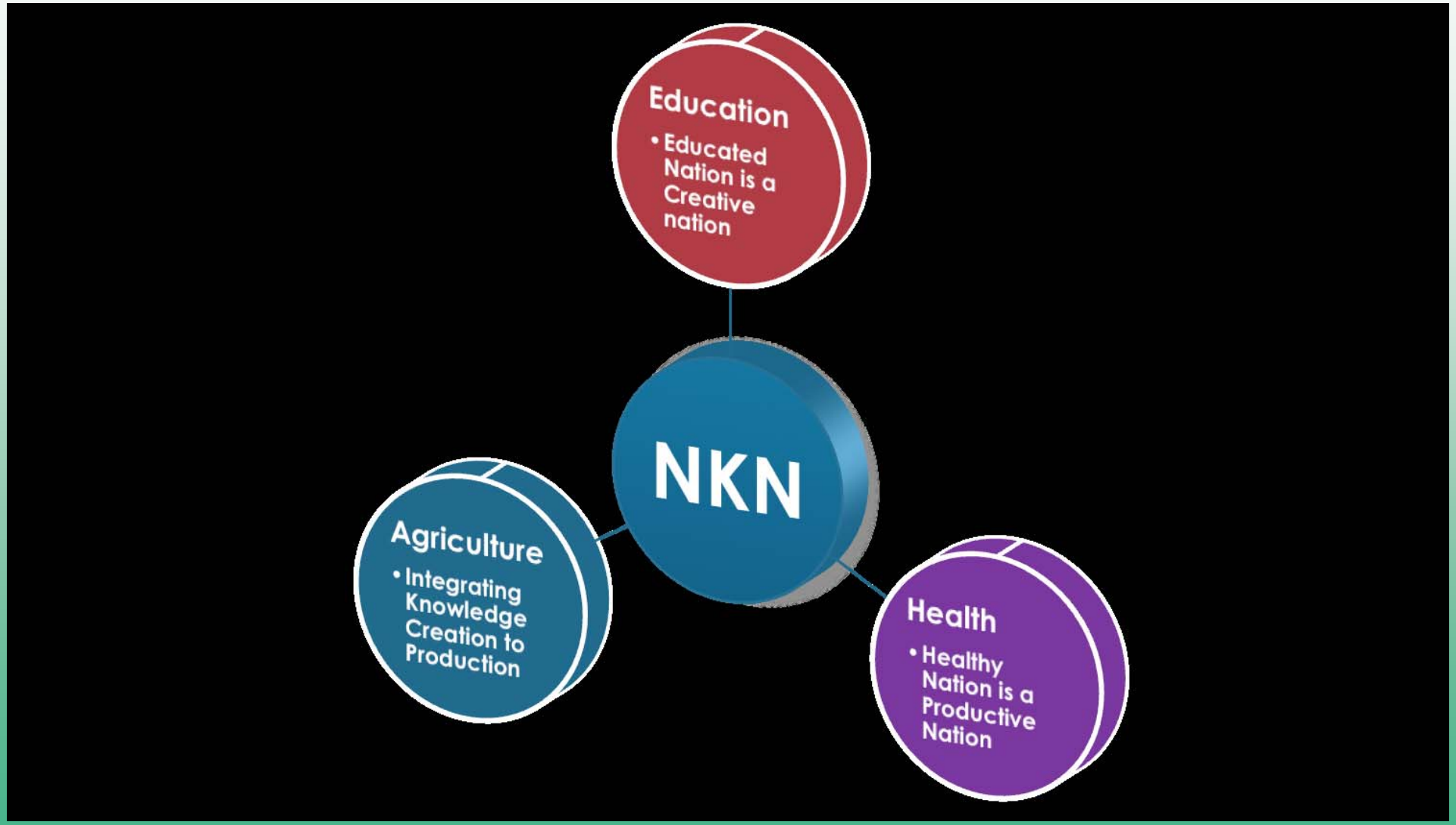
* Problem Size and Complexity
* Divide and Conquer
* Critical Mass of Scientists and Engineers
* Higher Level of Interaction at all levels
* Liberal use of ICT in normal work
* Automation and Remote Access to Experiments and Facilities

Bringing together the Accomplishments of Scientific Ministries and Departments of the Government of India



Creating Synergy Across Institutions of Higher Education and Research in India

Understanding Human Welfare and Development by Bringing together Education and Research in Health and Agriculture in India



NATIONAL KNOWLEDGE NETWORK:

WELCOME TO 10,000,000,000 BITS PER SECOND !

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Why NKN?

NKN creates the ambience to bring together Science, Technology, and Higher Education

In other words NKN is

ICT* for Human Development

Focusing on

Education, Health, and Agriculture

ICT - Information and Communication Technology

Property of ICT that Attracts... Attention…

Annihilation of Distance

Ultra High Bandwidth

Near Instantaneous Observation of Events

Low Latency

The Benefits: Education

- Access to Secondary and Higher Education
- Social Equity
- Quality Teachers and Quality Lectures
- Virtual Access to Expensive Laboratories
- Enable to see and Empower to Visualize
- Inculcate Scientific thinking
- Remove economic and social differences
- ***Educated Nation is a Creative Nation***

The Benefits: Health

- Modernizing Public Health Centers
- Digital Health Information
- Access to Highly Competent Doctors
- Virtual Reality – No Fiction
- Timely Detection and Cure
- ***Healthy Nation is a Productive Nation***

Seeing is Believing

WHY?

- Computational Resource Access
- Critical Mass of Scientists in Key Areas
- Common Country-wide Classrooms
- Increased Peer Group Interaction
- Data Bases Sharing Online

Application Requiring High Bandwidth

- Virtual Laboratories
- Collaborative Mega Science Projects
- Innovative Info-Bio-Nano Experiments
- Non-invasive Medicare for Diseases like Cancer
- Diagnostic Domes as Public Health Centers in Rural Areas
- Country-wide Classroom
- University without Walls
- Voice & Video Conferencing among Researchers
- On-line access to Electronic Resources

Life @ 10 Gbps

- Scenario #1: **Education**
- Scenario #2: **Research**
- Scenario #3: **HealthCare**
- Scenario #4: **Governance**
- Scenario #5: **FarmCare**
- Scenario #6: **HPC: Weather Modeling**

NKN Design Philosophy

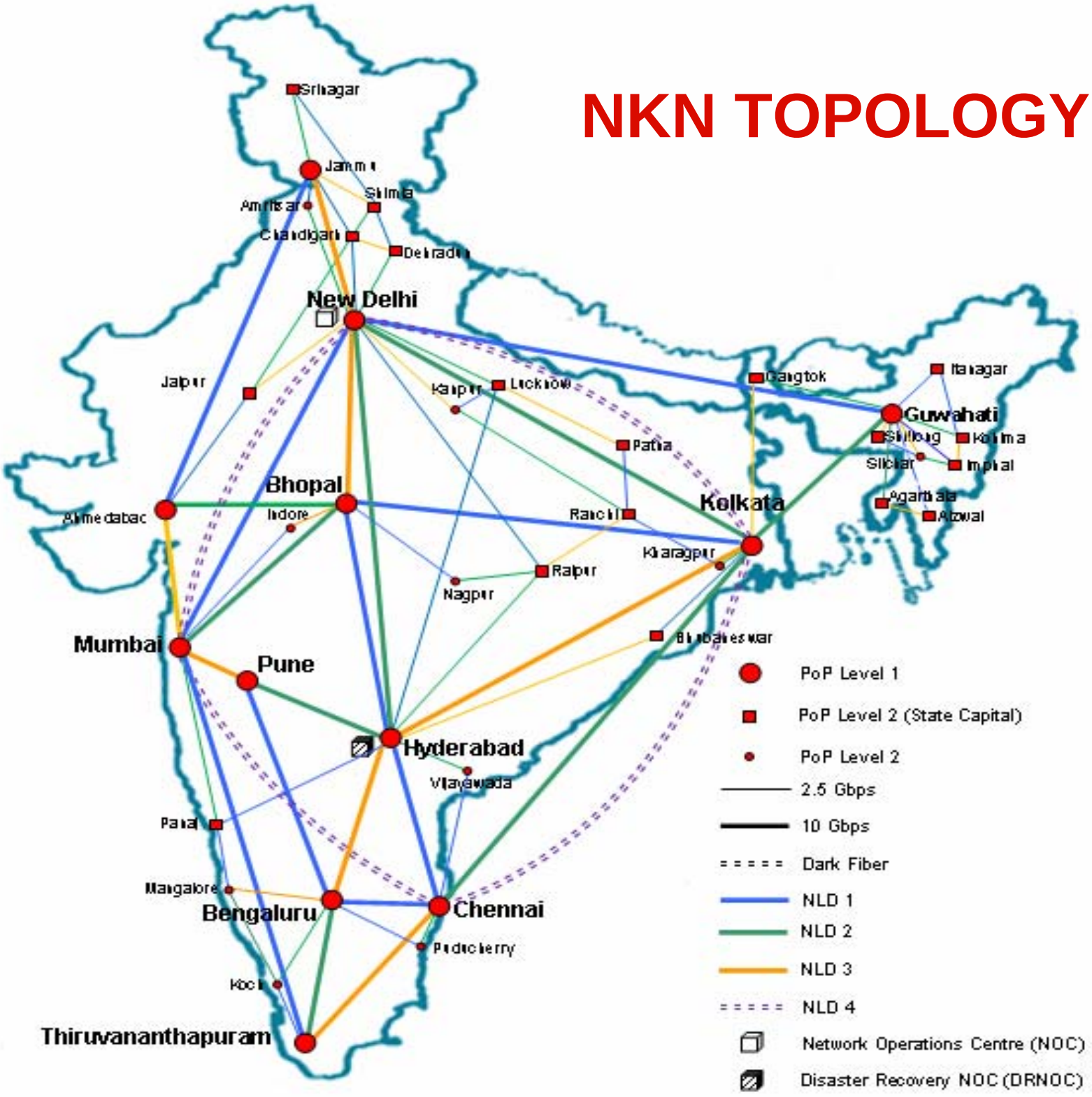
- To build a scalable network, which can **expand** both in the **Reach** (spread in the country) and **Speed**.

- To be a common Network **Backbone** like national highway, wherein different categories of users shall be supported.

Features NKN

- High Capacity, Highly Scalable Backbone
- Provide Quality of Service (QoS) and Security
- Wide Geographical Coverage
- Common Standard Platform
- Bandwidth from Many NLD's
- Highly Reliable & Available by Design
- Test beds (for various implementation)
- Dedicated and Owned.

NKN TOPOLOGY



Relevance to Indo – US JCM

- 10 Gbps connection between India and USA is becoming a necessity to leverage the outcome of S&T cooperation – The interconnection is required both through East Coast and through West Coast.
- Identification of “Groups of Institutions” on Either side and electronically and Seamlessly bringing them together.
- NKN already has the Concept of Model Pilot Projects – an idea worth scaling at Indo – US level.

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