# Smart city to Smart village

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# **Speaking points..**

- Opening remarks..
- Prevailing environment
- Smart city vs Smart village
- Various perspectives on smart village
- A few interesting initiatives
- Closing remarks..

# My presentation based on

A Vision of smatter cities by IBM

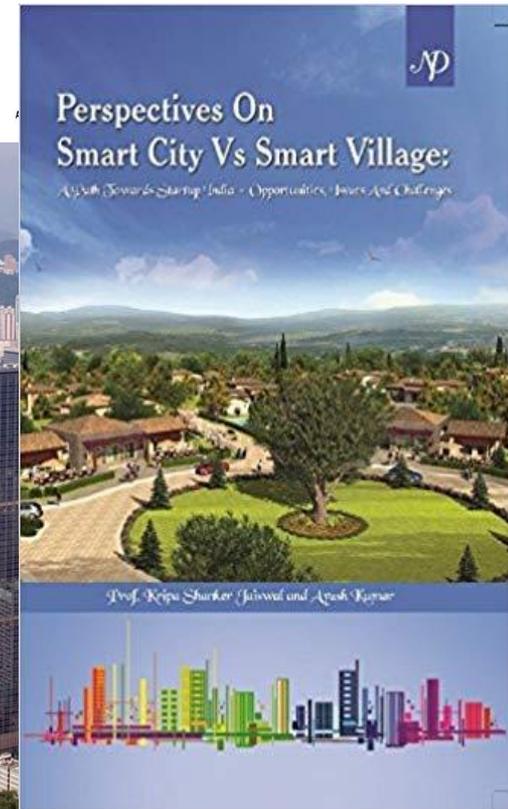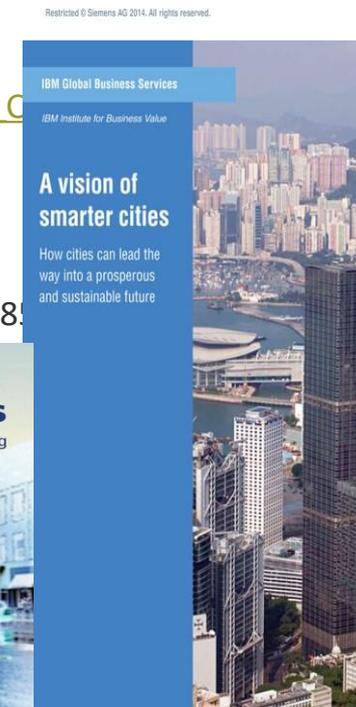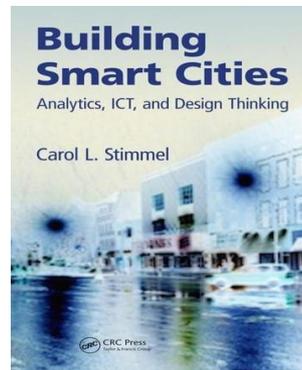http://www-03.ibm.com/press/attachments/IBV_Smarter_Citie

Smart cities: A Siemens perspective

http://www.clines-
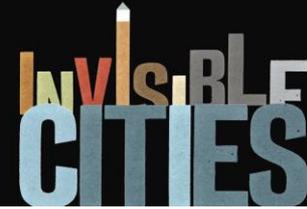project.eu/gestor/recursos/uploads/archivos/Siemens_VolkerHessel_O
14.pdf

**Building Smart Cities: Analytics, ICT, and Design Thinking**
By Carol L. Stimmel, 2015 ,Auerbach Publications/ CRC press

https://www.amazon.in/Perspectives-Smart-City-Vs-Village/dp/9385

# **Opening remarks..**

- In the landmark novel *Invisible Cities*, Italo Calvino writes, "You take delight not in a city's seven or seventy wonders, but in the answer, it gives to a question of yours."

- Every Indian city asks more questions than it hopes to answer, but it all comes down to :"Can you survive me ?"

- https://www.goodreads.com/book/show/9809.Invisible_Cities

- Source: Manik Sharma-  https://m.dailyhunt.in/news/india/english/the+indian+economist-epaper-indecono/why+india+needs+smart+villages+not+smart+cities-newsid-93737959

# *Music of the spinning wheel..*

MUSIC OF THE
*Spinning Wheel*

Mahatma Gandhi's Manifesto for the INTERNET AGE

'A deeply intellectual study'
*- Dr Harold Kroto,*
Nobel laureate nanotechnologist

'A fascinating book. Gandhi
is a prophet for the age of the
communication revolution'
*- Ray Kurzweil,*
renowned techno-futurist

SUDHEENDRA KULKARNI

- Internet, as a spinning wheel, is a technological tool, to help us move to a higher plane.
- For empowerment of the common man, internet is the biggest contributory tool
- Broadband as  a tool of inclusive development
- Once villages are connected to internet, then it will enable decentralization of development which would "fulfill Gandhi's dream".

- **https://www.amazon.in/Music-Spinning-Wheel-Sudheendra-Kulkarni/dp/9381506**167

# Remark..

- Most of the 'unsolvable' problems in today's cities (traffic, garbage and sanitation) stem from a single root cause – the massive inflow of people, which chokes the cities.

# Philosophy of our institute..

विश्वजीवनामृतं ज्ञानम्

- Do research on unorganized sector

- Focus on applied research

- Have an interdisciplinary approach

- Evolve protocols and procedures for unorganized sector

- Map practices of organised sector to unorganised sector

# **Definition**

- A settlement with a maximum population of 15,000 is considered "Village"

  ( source: Planning commission)

- According to 2011 census ", rural area has population of 68.84%,whereas, urban area has population of 31.16%

- *We have 6,40,867 different villages. The size of these villages varies considerably, with 2,36,004 villages having a population of fewer than 500, while 3,976 villages have a population of over 10,000*.
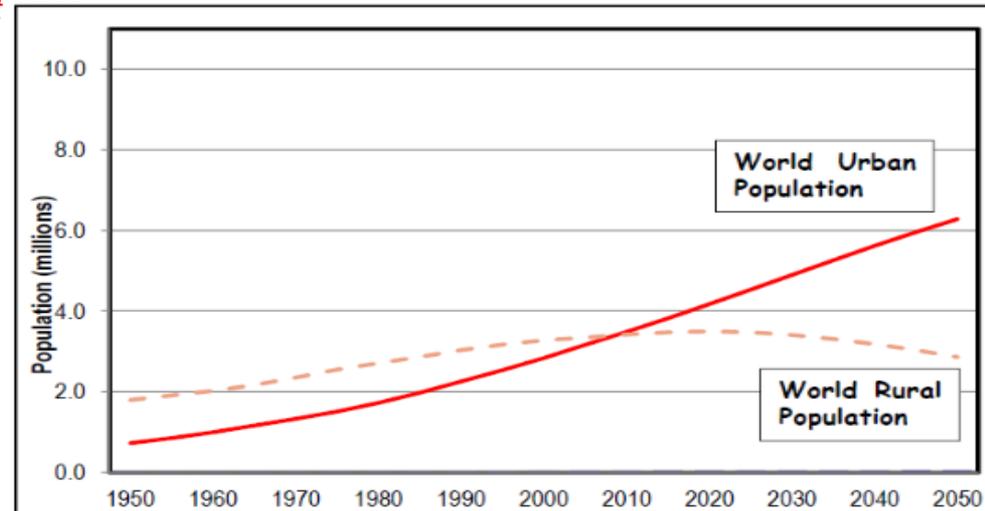
# Let us get into present: Smart regime..

| Smart Phones | Smart Homes | Smart Vehicles | Smart factory |
|---|---|---|---|
| | | | Smart City /village |
| Technology Push | | | Market Pull |

# Context

- As the global population continues to grow, the migration of people from rural to urban areas has been on the rise.
- Estimated that urban population shall double by 2050 with urban residents in India alone numbering 843 million.
- Cities thus act as 'engines to economic growth'
- To accommodate the massive urbanization cities need to find ways to increase efficiency, manage complexity and improve quality of life- Develop into Smart Cities.

*Smart City Mission :Prof K C Iyer,(IIT Delhi) at , Keynote address at Bhagalpur College of Engineering, Bhagalpur/ 26th August 2018*

# Source ..

- https://nexus-center.ch/smart-villages-instead-of-smart-cities-why-our-focus-is-rural/

# Case for smart village..

- **Policy of leaving no one behind**. We believe that rural regions also have the right to adequate infrastructure development. 3/4ths of the world's poor live in rural areas. Thus, the increasing pressure on cities as well as the rural-urban divide shall be reduced.

- **Food security**. At the current rate of global population growth, the world will need to increase food production by 50 – 100% by 2050. Knowing that we **depend to 50% on smallholder farmers** to reach global food production, **including them in development progress** is crucial.

- The **balance of our global ecosystem** is **struggling** with the rapid and uncontrolled growth of cities and aching under the pressure of urbanization. We **counter that imbalance** by establishing sound and functioning rural (eco)systems.

# Case for smart village..

- **Promising potential for financial profit**. The growing city populations need increasing amounts of food. The higher economic status often asks for better quality and more sustainability. Both trends add to the potential of smallholder farmers and fishermen to become economically profitable and offer attractive employment opportunities for young generations.

- Even though "Smart Cities" receive a lot of attention from investors and development programs, **we believe that "Smart Villages" offer more direct potential**. Less administrative and legal hurdles, faster implementation, manageable size, better social and ecological impact and higher scalability are just some advantages of "Smart Villages" compared to "Smart Cities"

# One more reason..

- India's crafts thrive in villages, especially as cooperative ventures.

- Pottery, metal craft, weaving, jewellery making, wood craft, shell craft, cane craft, embroidery, ivory craft, glass craft and paper craft could be sources of income.

- The arts and crafts ecosystem of villages is impossible to recreate in cities. A great deal of export potential is hidden here. Senior/elderly artisans can be employed as 'trainers

# One more reason. (contd.)

- Villages traditionally preserve large number of water bodies like ponds, wells, bawadis, canals etc.

- Training villagers in water harvesting methods, rejuvenating ponds/wells to improve water storage and sharing these good practices systematically with others, would help mitigate hardship

# Smart villages..

- " *Smart Villages are rural areas and communities which build on their existing strengths and assets as well as on developing new opportunities", where "traditional and new networks and services are enhanced by means of digital, telecommunication technologies, innovations and the better use of knowledge".*

  o EuAction for Smart Villages, European Commission

# Another perspective

- Resource efficient rural activities including smart agriculture, and public assess to all necessary facilities for human well being and satisfaction of high standard quality of life

# **Village's ambit..**

- A village as a part of a panchayat has 29 subjects within its ambit

- Some of them are :
  - agriculture, land, animal husbandry, fisheries, forestry, housing, water, sanitation, school or education, health, fuel and fodder, electricity, libraries, cultural activities, family welfare, women and children, social welfare, small scale industries, roads, bridges, infrastructure, markets and fair, and public distribution.

# **Motivation..**

- Most effective way to bridge the rural-urban divide

- 'Providing Urban Amenities in Rural Areas' (PURA)

- Self-sufficiency ?

- A  sustainable model of development ?

# Remarks..

- Internet has made it easy for companies to work from anywhere. So where is the need to crowd around only in Mumbai, Bangalore and Chennai?
- We don't need anything new !
- Creative restoration !

# What is happening today..

- Enhanced expectations & aspirations!

- An increasing focus on interdisciplinary research; merging of discipline boundaries !

- An increasing focus on problems, rather than techniques;

- Greater emphasis on collaborative work and communication

- Smart village offers a landscape of immense opportunities to explore .

# Elephant & Six blind men ...
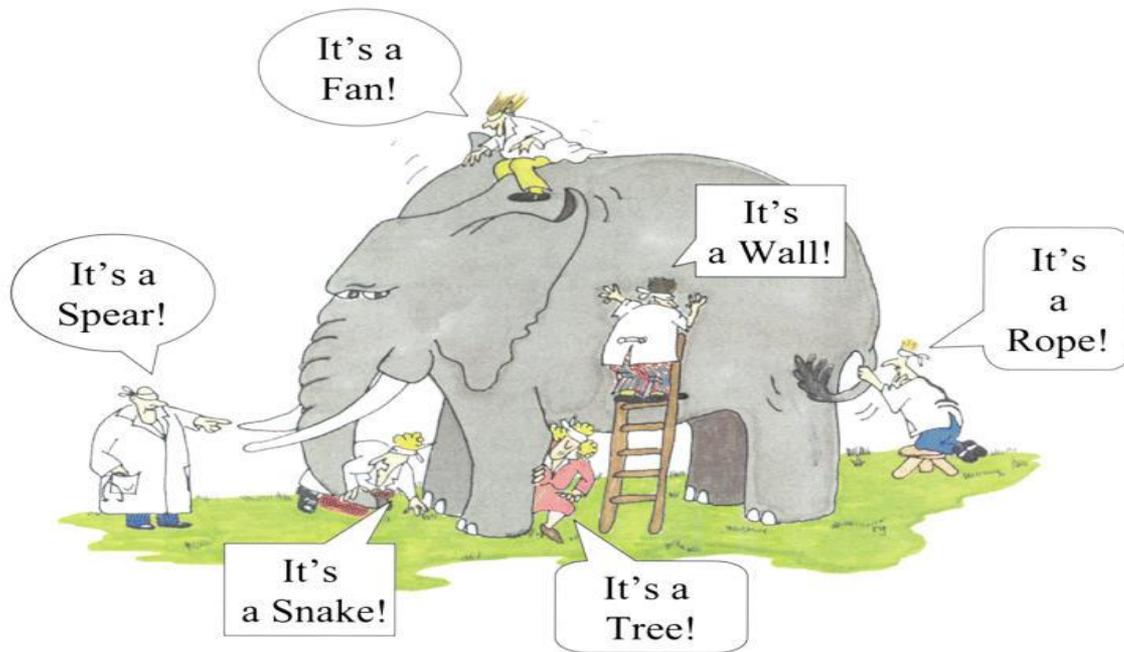
# Views of elephant

- Planners view
- Architect's view
- Business view
- IT view
- Citizen's view
- Sustainability view

# Architect's view

- Energy efficient /green dwelling
- Commercial and residential clusters
- Use of local material
- Appealing aesthetics keeping heritage in mind
- Transportation network in line with the local needs

# Business view

- Smart village as a competitive business unit
- Hub of activities
- Able to attract investors due to tremendous opportunities
- Rural entrepreneurial spirit
- Employment generation possibilities
- Connectivity with others

# Insights ..1..

- Village – a microcosm of world, community living, hub of activity, wealth generator

- Across the globe, governments, industrial federations, and corporations have recognized the significance of creating their own added value through production.

- One can't sustain unless villages are strong !

- Concept : "systems" !

# IT View
# Smart dimensions

- Smart governance
- Smart economy
- Smart mobility
- Smart environment
- Smart people
- Smart living

# Indicative disruptive technologies responsible for smartness

- Analytics and Big Data
- Mobile technology
- AI & Robotics
- Cloud Computing
- Social networking

# Four big forces ?

- Digitalisation
- Personalization
- Localization
- Democratization

# Four big forces..

- **Digitalisation** of land records, citizen's information, natural resources health records, effective quality control at multiple and remote locations

- **Personalisation** of services tailored for individual users and user-friendly enhanced services

- **Localisation** of services, point of contact, and material use for quick response, and environmental sustainability

- **Democratisation** of civic service chain through enhanced participation from administration, citizens , service providers and industry partners

# Scheme of things

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                    ┌─────────────────────┐
                    │  Internet of things │
                    └─────────────────────┘
        ┌───────────────────┼───────────────────┐
┌────────────────┐  ┌────────────────┐  ┌──────────────────┐
│Digitized services│ │   Digitized    │  │   ...Digitized   │
│                 │  │   Business     │  │  Administration  │
└────────────────┘  └────────────────┘  └──────────────────┘
        │         ┌───────┴────────┐
┌────────────────┐           ┌────────────────┐
│ Smart products │           │  Smart village │
└────────────────┘           └────────────────┘
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| Product innovation | Process innovation | Intelligent systems | Cloud and AI based networking |
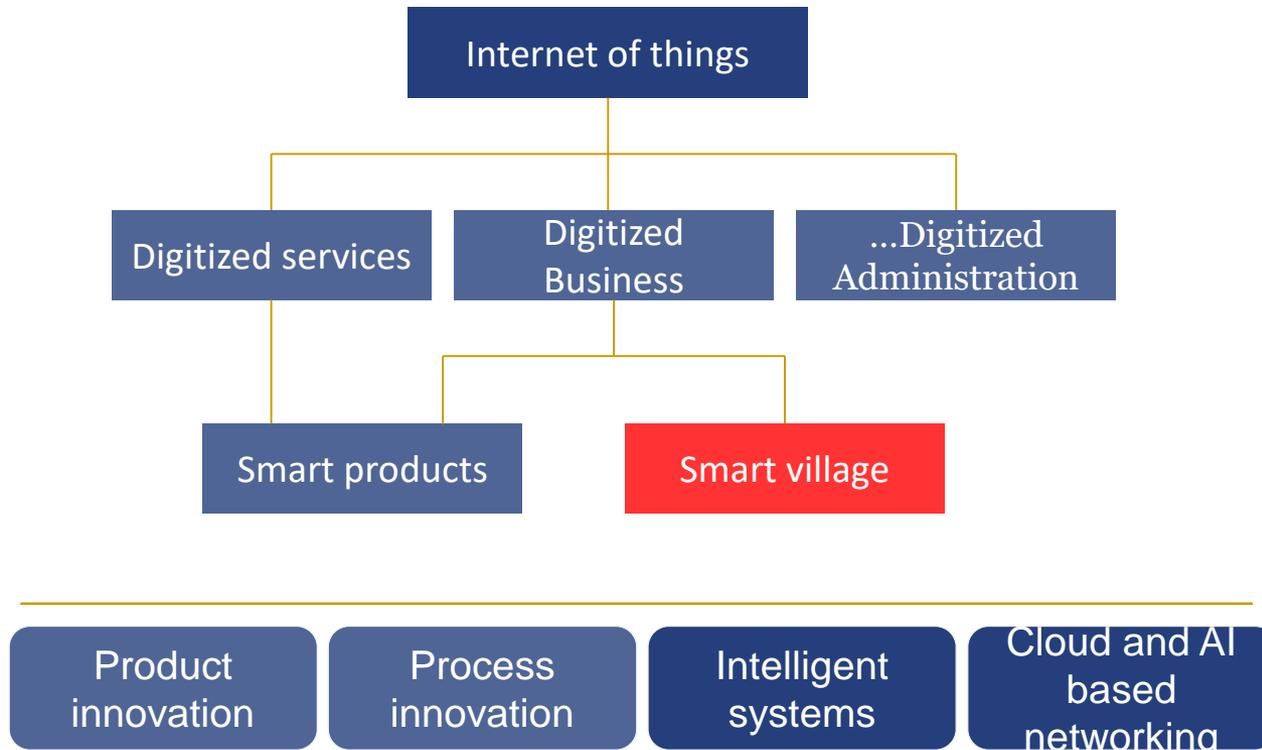
# Insights ..2..

- New organization of value chains based on networks of stakeholders .

- On the one hand through vertical network distribution, of infrastructure and services (smart utilities, health, building etc.)

- On the other hand through horizontal network distribution between Government, citizens and service providers

- Value chains generate hybrid entities (Part material/ part service /part knowledge)

- Village administration : Service orientation ?

# Citizen's view

- Preservation of culture & values !– IT helps in this !!

- Accessibility & reach

- Quality infrastructure

- Citizen's participation in decision making - Crowdsourcing

- Quality of service – healthcare/education/utilities etc.

- Responsive administration-panchayats

# Expectations of citizen.

- adequate clean water supply,

- assured electricity supply,

- sanitation, including solid waste management,

- affordable housing,

- robust IT connectivity and digitalization,

- good governance, especially e-Governance and citizen participation,,

- Safety/security of citizens, particularly women, children and the elderly, and

- health and education.

# Sustainability view

- Economic, Environmental & Social sustainability
- Attractive business opportunities which are sustainable
- Carbon footprint
- Green and energy efficient technologies
- Minimum damage to mother earth
- Social infrastructure
  - Care for elderly
  - Care for physically challenged
  - Synergistic co-existence / communities of practice

# Implications ..1..
# Change in orientation

- From compartmentalized to interdisciplinary
- From pure administrative to service
- From control & command to empower & enable
- From push to pull
- From Reactive to Responsive

# Implications ..2.. Networking

- Smart village presents a big opportunity to have an enterprise view of village where there will be a strong degree of coupling between Cyber and Physical world!.

- Integration of IT and Non-IT view

- The entire village can be visualized and enabled through apps available on smart devices - remotely controlled yet at the ground level .

- Networking of institutions, stakeholders and partners !

- Village is visualized as smart, social and sustainable !

# Implications ..3..
# Quality of workforce

- Habitat for both-production as well as service opportunties

- Rapid change of necessary skills/capabilties

- Innovative ways of control and monitoring of behavior and performance

- Increased expectons regarding quality of life

# Smart village

- Smart Agriculture: In order to increase quality/quantity of agricultural production using" Sensor" technology

- Democratic and make farms more "intelligent" and more connected through Precision agriculture "also known as' smart farming'

- Road Infrastructure: GIS

# **Observations..**

- Rural enterprises are seen more as a philanthropic gesture than viable business models.

- We need money to draw people, not just for sentimental values and feeling good.

- We need to mix and match across successful ventures to weave the solution, learn and adapt as we grow. And replicate and scale across,

# Smart village..

- Smart water supply

- Smart sanitization

- Smart Education

- Smart Disaster management(DM): DM cells may be set up at panchayat level to address the disaster related issues

# Smart village through Govt initiatives..

- *Shyama Prasad Mukherji Rurban Mission* (SPMRM) in 2016 - 300 smart villages to be developed

- *Sansad Adarsh Gram Yojana*, which envisages integrated development of selected villages

# Smart villages through CSR

- Nokia has launched a Smartpur project which aims to create a sustainable ecosystem where community members can leverage digital tools to bring efficiency in daily lives. It aims to bring transparency in governance, economic prosperity for households and ease of access to various government services and information.

- Tata Trusts supports agriculture intervention for tribal communities under its *Lakhpati Kisan*

# Some examples..

- Healthcare needs (Glocal Healthcare Systems, mHealth, iKure),

- Delivering quality education (Gyanshala, Hippocampus, Avanti),

- Providing decentralised energy solutions (Sun Moksha, Mera Gao Power, Mlinda)

- Transforming agriculture productivity (Ekgaon, Jain Irrigation, Milk Mantra)

- Providing drinking water and sanitation services (Sarvajal, Svadha, Banka Bioloo)

- Creating livelihood opportunities for women (Dharma Life, Frontier Markets, Sudiksha Knowledge Solutions)

# A few startups..

- **eFarm — an online marketplace for farmers, buyers**
- **I-Agri,** which works with 1,600 farmers from Andhra Pradesh and Telangana, connects the farmers with fertiliser makers and retailers as well as hotels. The startup collects produce from farmers directly in the districts and takes care of the logistics at its own expense. It charges the buyers and input companies which are looking to establish a link with farmers.
- FrontalRain provides cloud-based supply chain solutions for agri-businesses, cold-storage chains, distributors and retailers.

# SmartGaon

- NGO based in Mumbai
- The Mobile app has key features like the villagers' directory, news and events calendar, health centre, information cee, etc. in English as well as Hindi.

- SMART stands for
- S- social security schemes
- M- modern urban amenities
- A- adoption of smart agriculture practices
- R- roads infrastructure & transportation
- T- tech savvy
- Taudhakpur (Mirzapur Urf)
- https://smartgaon.org/

# A comparison..

| Attribute | Smart city | Smart Village |
|---|---|---|
| Focus | Technology intensive | People intensive |
| Approach | Fragmented | Integrative |
| Meeting of SDG | ? | Yes |
| Involvement of community | Passive | Active |
| Spread | Internet of Things | Internet of People + Internet of Things |

# Concluding observations..

❑ Smart village allows integration of various views.
❑ Opportunity to work seamlessly
❑ Opportunity to look from a systems perspective

*... becomes smart when the human and social capital investments, the traditional (transport) and modern (ICT) infrastructures, foster sustainable economic growth and an high quality of life, through an efficient management of natural resources and a participatory governance. (Nijkamp et al., 2009)*

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# Holistic view .. A way of life



**Warli Painting .. A tribal art form**

- A unique style
- Holistic life depicted in the paintings.
  - Coherence
  - Creativity
  - Collaboration
  - Inside-out and outside- in orientation
- Harmony with technology
- Harmony with people
- Harmony with nature

# Bottom line..

- **Inclusive development and shared prosperity**

# Without comment..

- *Smart villages can translate into improved farm productivity, water conservation and economic independence to village youth. It makes great social, economic and political sense.*

# **Acknowledgement**

- Prof S K Rao(VC, RVSKVV)

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# Thank you !

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