Becoming An Innovator: Uncovering your inner problem-solving power

Powering the "Dynamics of Innovation" to enable spectrum of possibilities - 1

Partha S. Ghosh

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The illiterate of the 21st century will not be those who cannot read & write, but those who cannot learn, **unlearn**, and **re-learn**.

Alvin Toffler

Author of "Future Shock"

The loosing organizations of the 21st century will not those who cannot *innovate & serve*, but those who cannot learn, **unlearn**, and **re-learn**.

Partha Ghosh

Several critical questions:

1. What are the **fundamental factors** that make certain communities/nations more innovative than others?

2. What are the specific **mechanisms that you could embrace**, - that could trigger and/or accelerate the **virtuous cycle** of “innovation dynamics” in your environment - at macro and micro-economic levels?

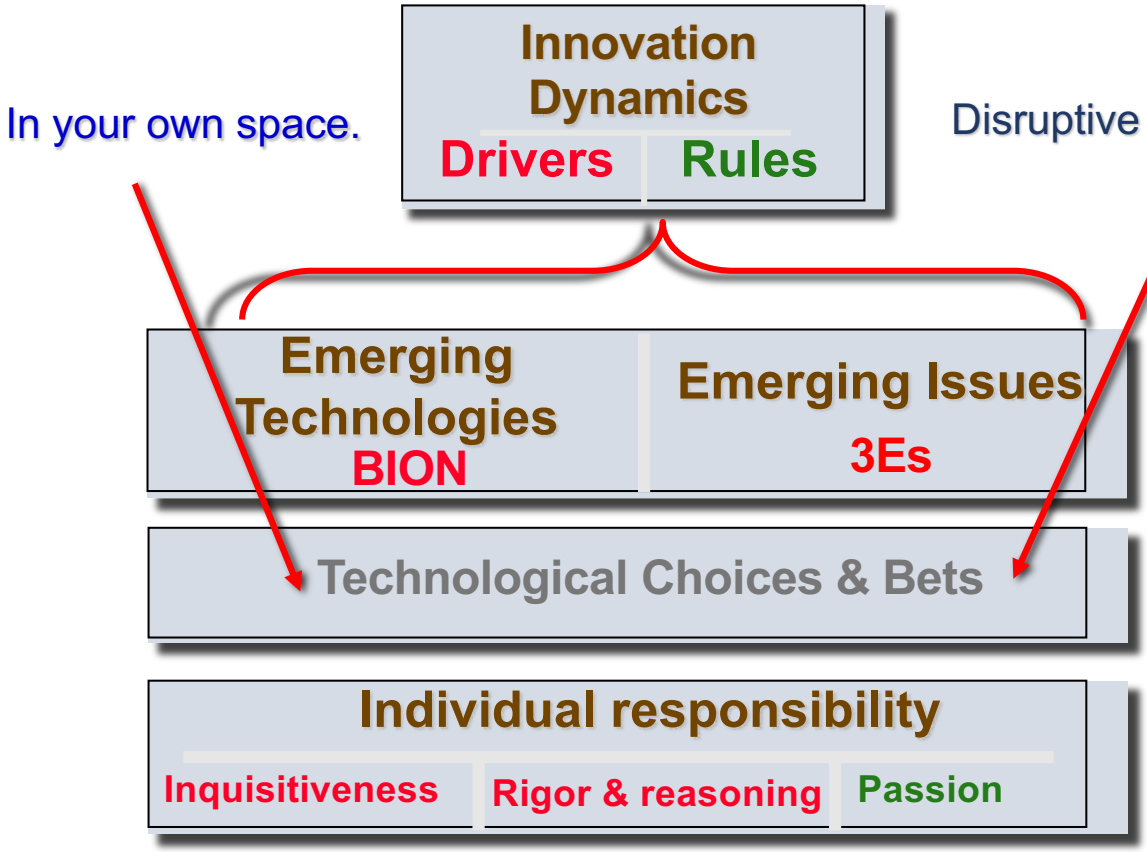
3. How should **collaborative processes** be developed and managed across different segments/nations so that economic value creation through innovation, - such as AI is *relatively more equitable*?

Agenda for the 5 Days

Becoming an Innovator

1. Putting Innovation in the context of the Modern Civilization
2. Demystifying Innovation: Unlocking the Power within you
3. Nurturing Genuine Problem-Solving Skills: The 3 Vectors?
4. Becoming an Innovator: Opportunities abound?
5. Practicing Innovation: Being in the flow as an active player

Overarching Objectives



1. Your **Focus?**
2. Which **Playing field/game?**
3. **Which problem(s)** you wish to solve?
4. **Your brand ?**
5. **How do you launch the process?**

Agenda

Putting Innovation in the context of the Modern Civilization

1. Innovation through the ages – a few common denominators
2. Civilization at the point of inflection – Need for breakthroughs?
3. Challenges in developing nations are even more significant
4. Opportunities to think fresh in privileged and underprivileged environments? It is your turn?

Agenda

Putting Innovation in the context of the Modern Civilization

1. **Innovation through the ages – a few common denominators**
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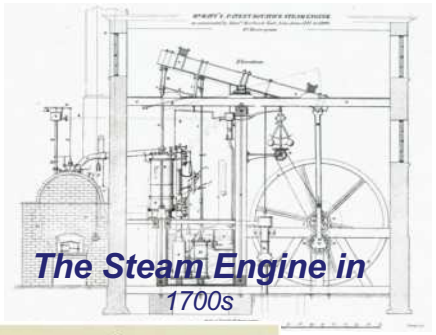
Innovation through the ages…..

Domestication 5500 years ago

Paper currency in China in 9th Century

Invented in China in 14th Century

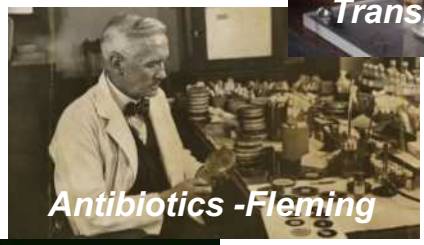


The Steam Engine in *1700s*

Gutenberg's printing press. 1440 in Germany

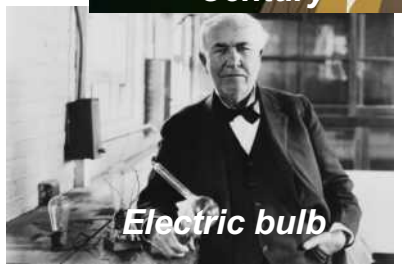
Lens in 13th Century years ago

Transistor 1947



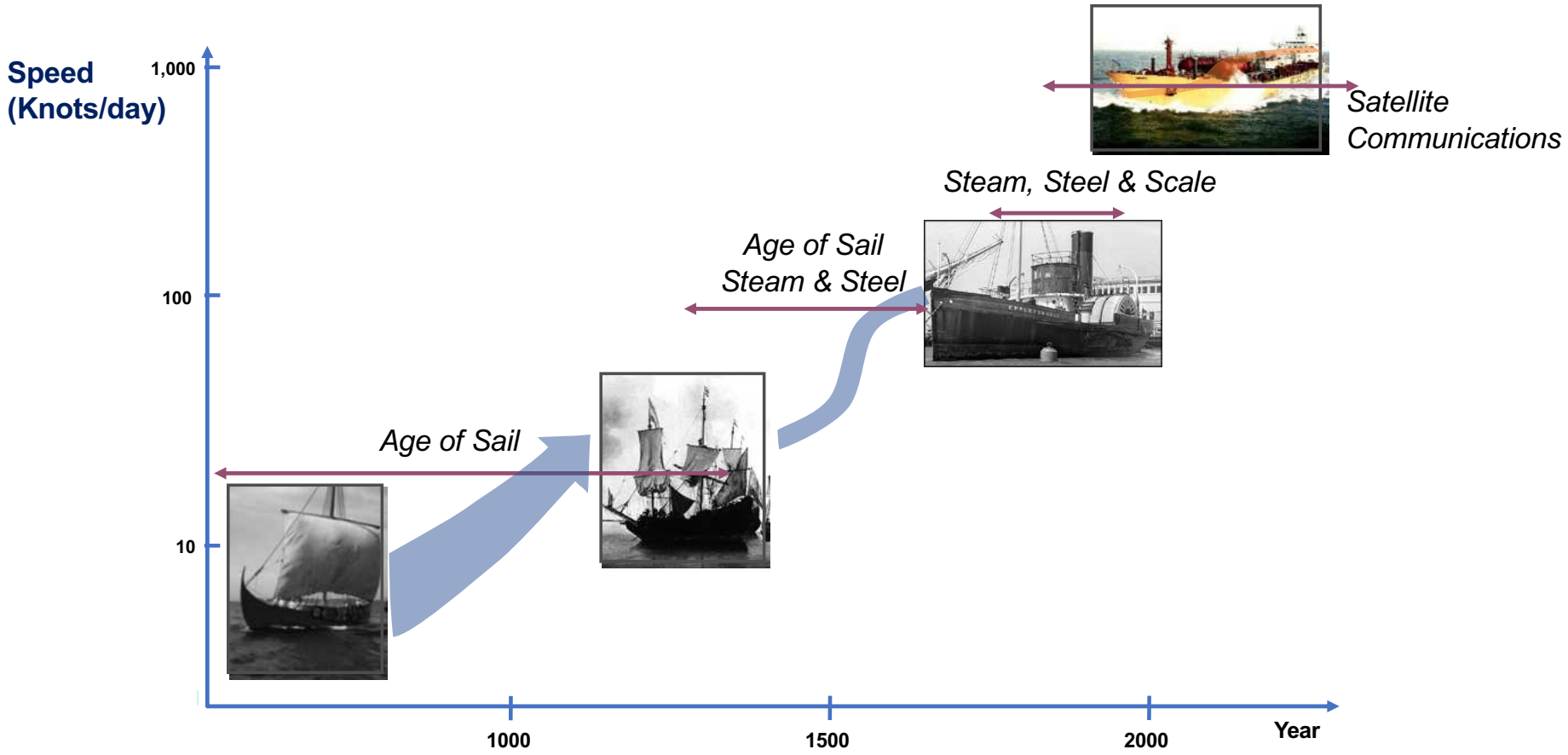
Antibiotics -Fleming

Morse code 19th Century



Electric bulb

Innovation plays in Maritime transportation



Innovation in India…..

Zero… without which there would have been no binary system; Shunya mentioned in Sanskrit texts in 400 BC

Geometry (Gyasmiti) measuring the earth.. 1000 BC

The Value of Pi: Baudhayana Shulba Sutra of 6th Century BCE

Emotions of Plant/Radio waves: J.C. Bose

Hydroquinone: Malaria treatment P.C. Ray

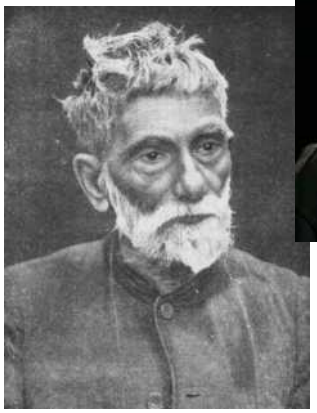
Raman Rays: C.V. Raman

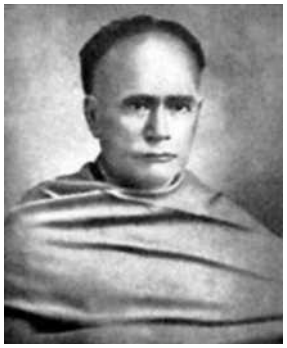
God Particle: Satyen Bose

Saha Ionization Equation: M.N. Saha

The common denominator(s)?

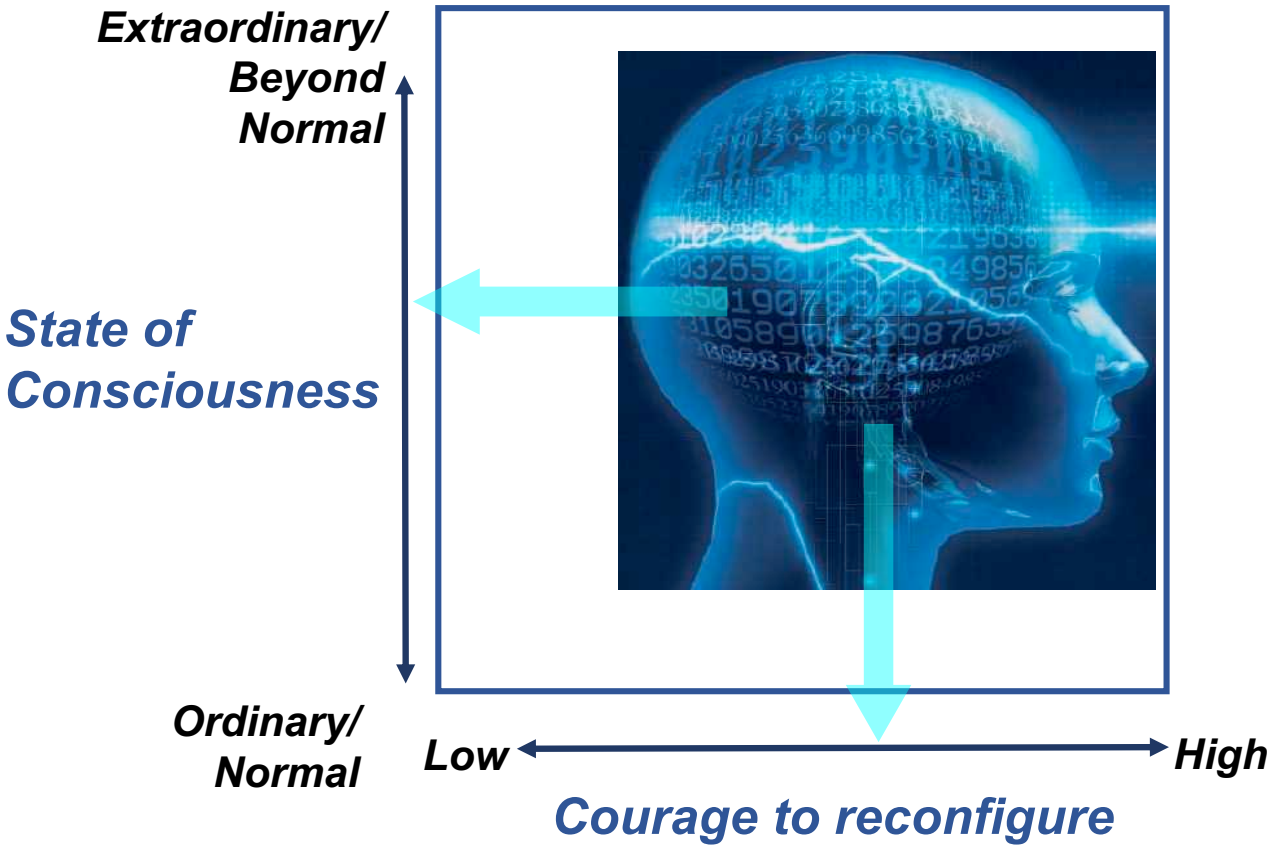


“A sixteen-year old” s sense of purpose

Two Significant Requirements – The Common denominators



Imagination is more important than Knowledge. Knowledge is limited**. Imagination encircles the world**…

Albert Einstein

Agenda for session 1

Putting Innovation in the context of the Modern Civilization

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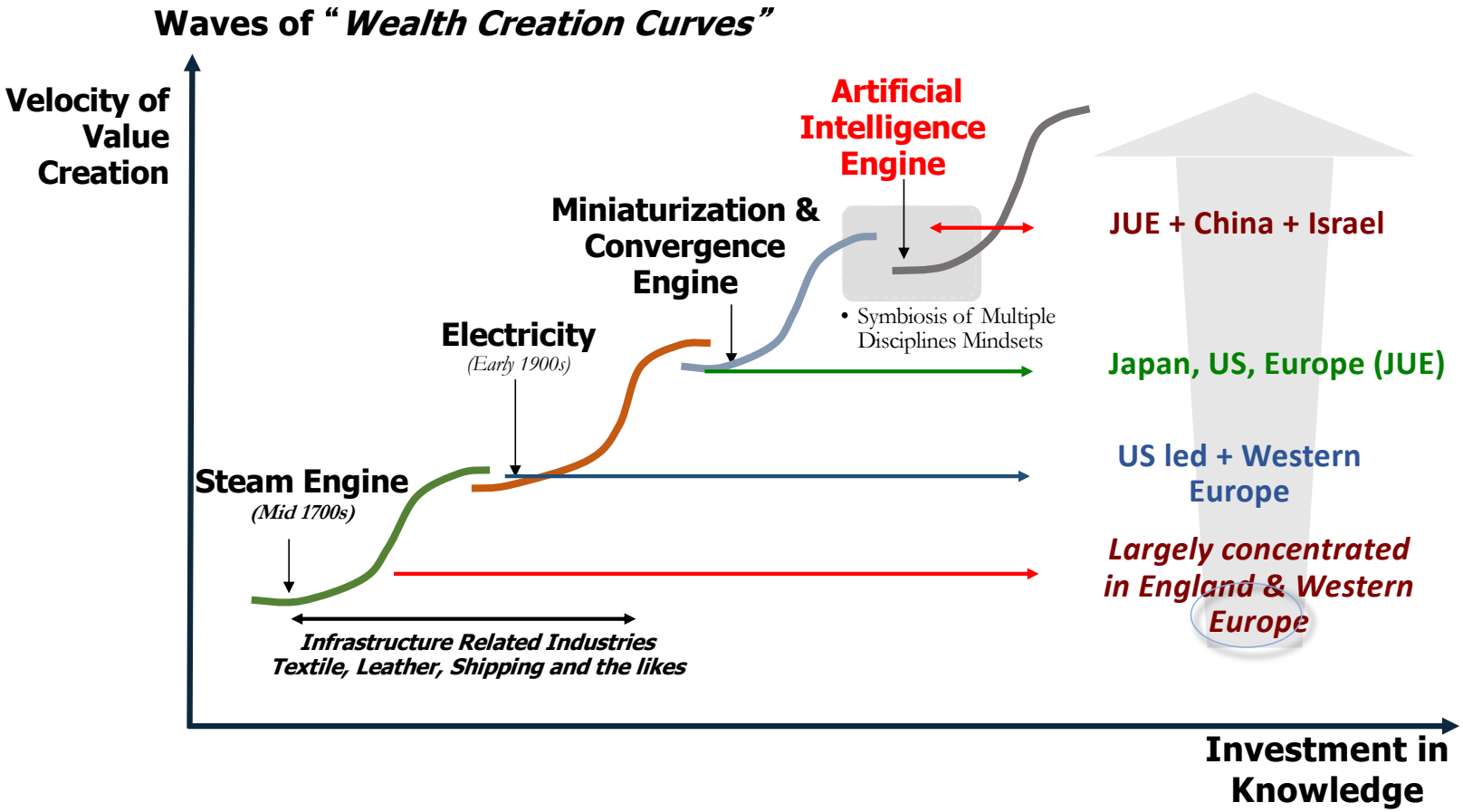
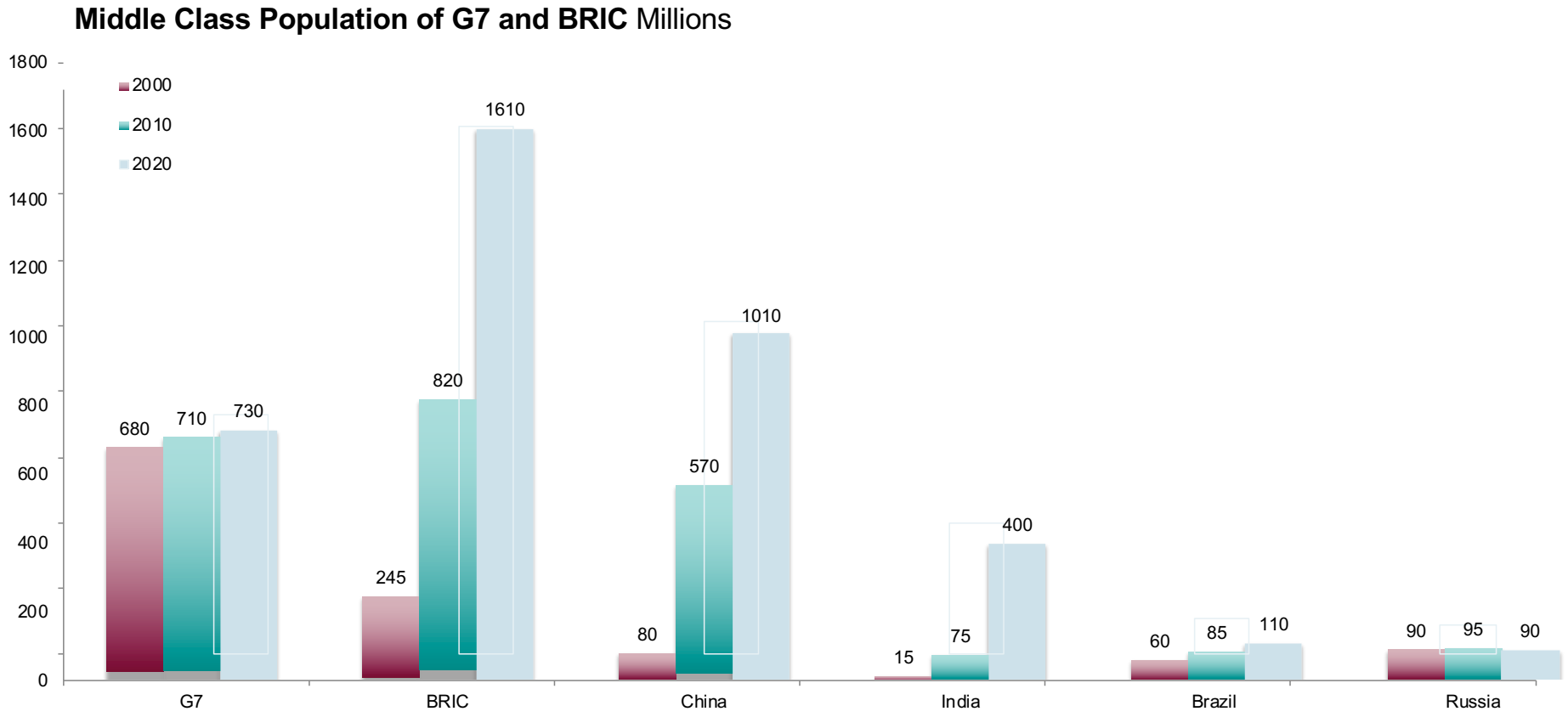
Innovations over the past 500 years have essentially limited within a few regions



Rising middle class in China….

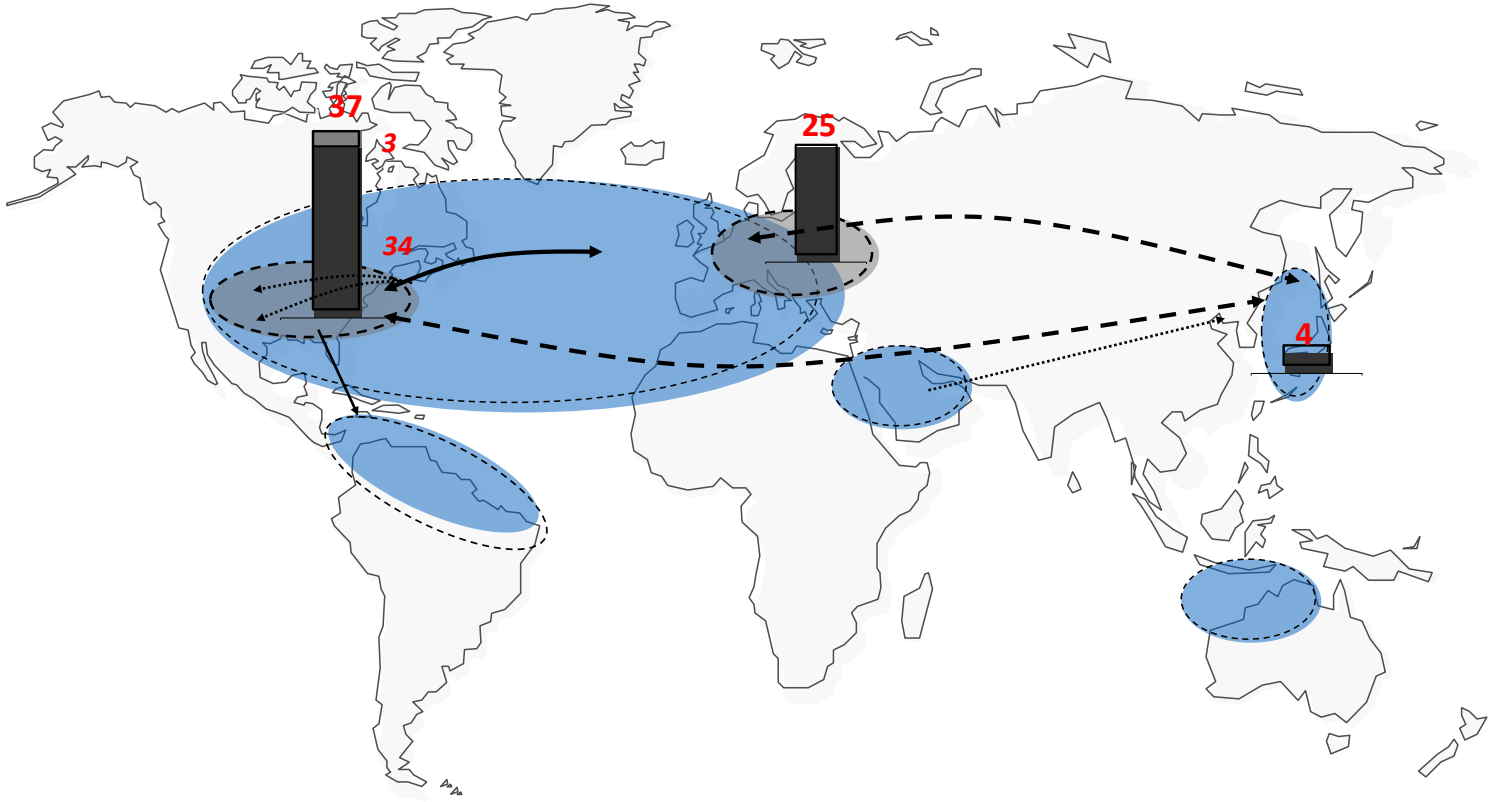
SHIFT IN ECONOMIC CENTER OF GRAVITY



Source: World Bank and Goldman Sachs
**Middle Class: Annual income(current value) >$6000, <$30000*

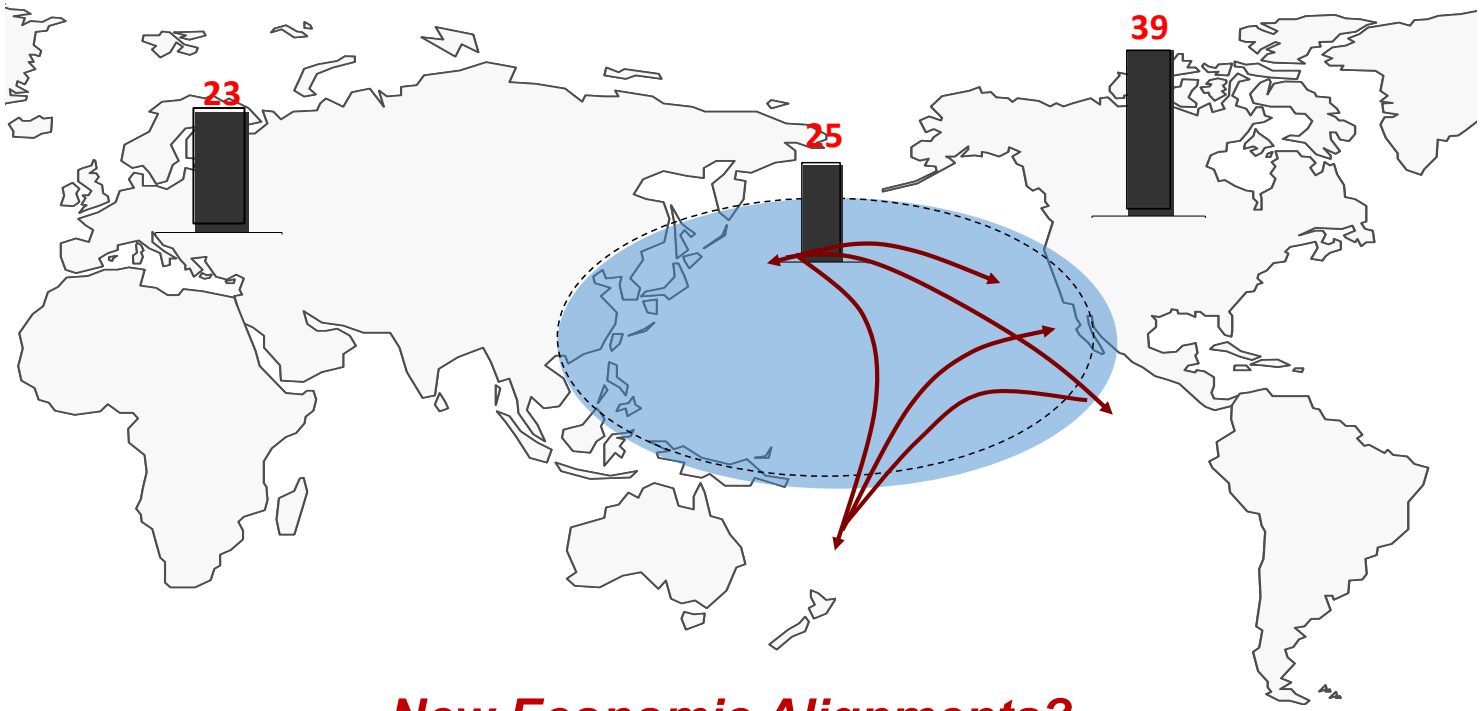
Shifting Geo-Economic Equations: Globe Half a Century Ago

Percent of GDP Distribution in the Mid-Sixties



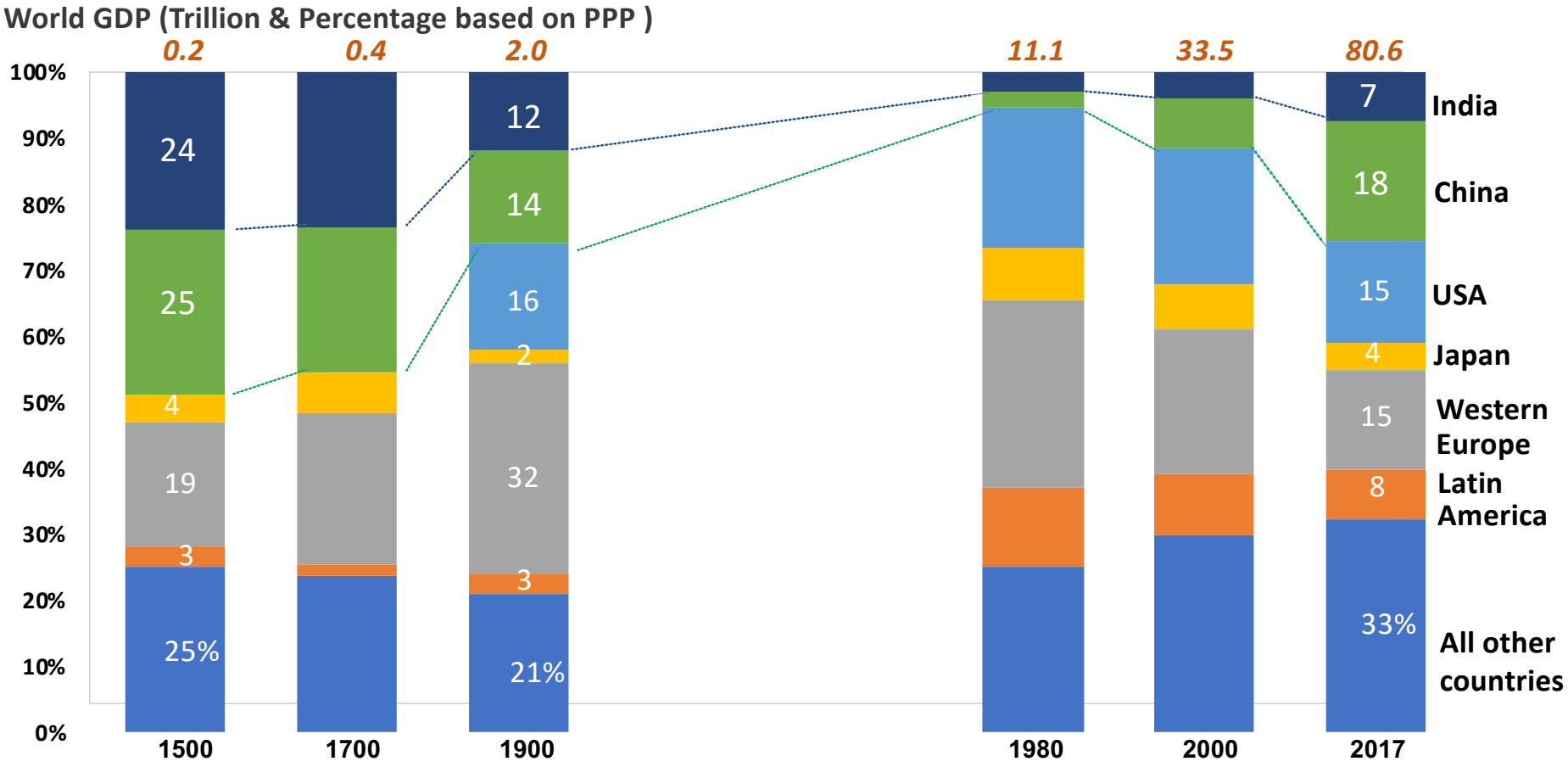
Globe In the 21st Century: Shifting Center of Gravity

Percent of GDP Distribution



New Economic Alignments?

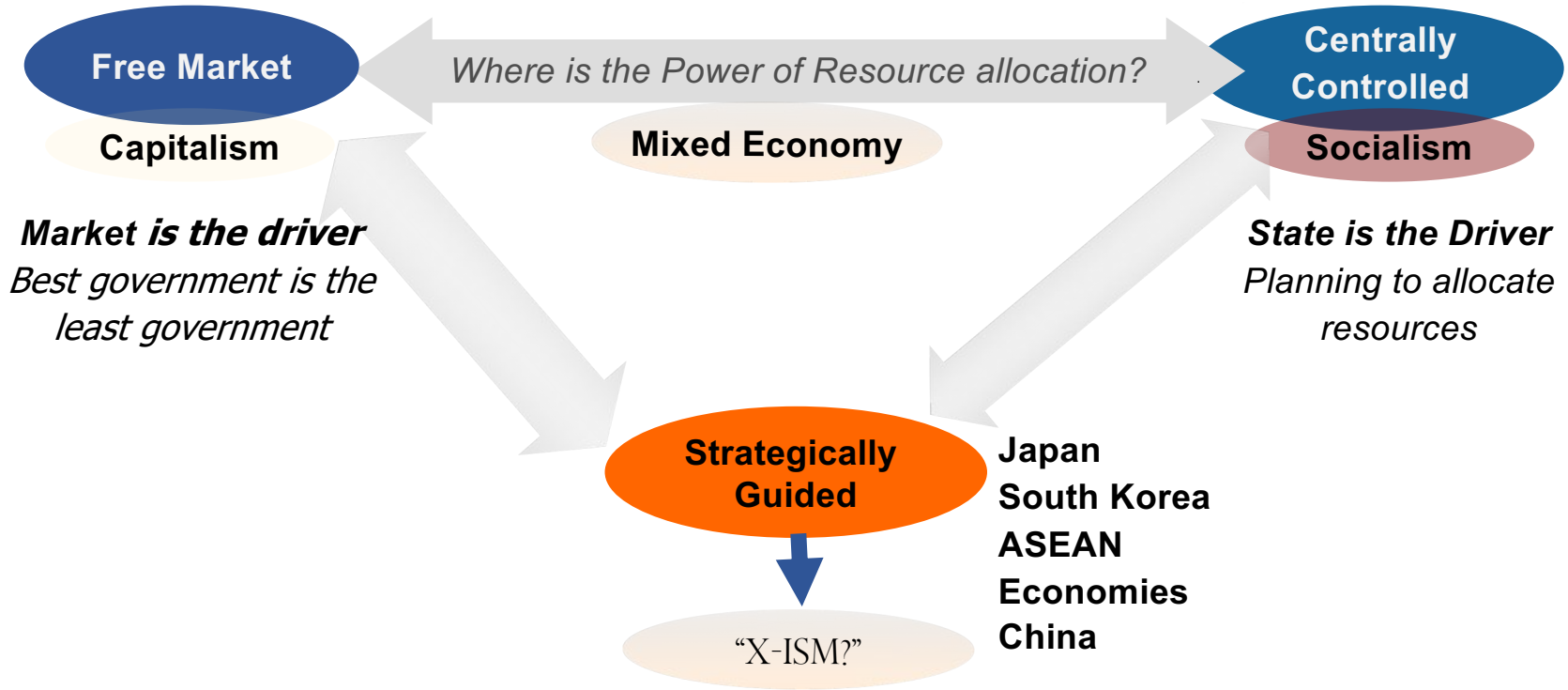
China is on the way to regaining its past glory



Data Source: IMF/Maddison Historical Statistics

Future of Resource Allocation Mechanisms: Need for Strategic Guidance

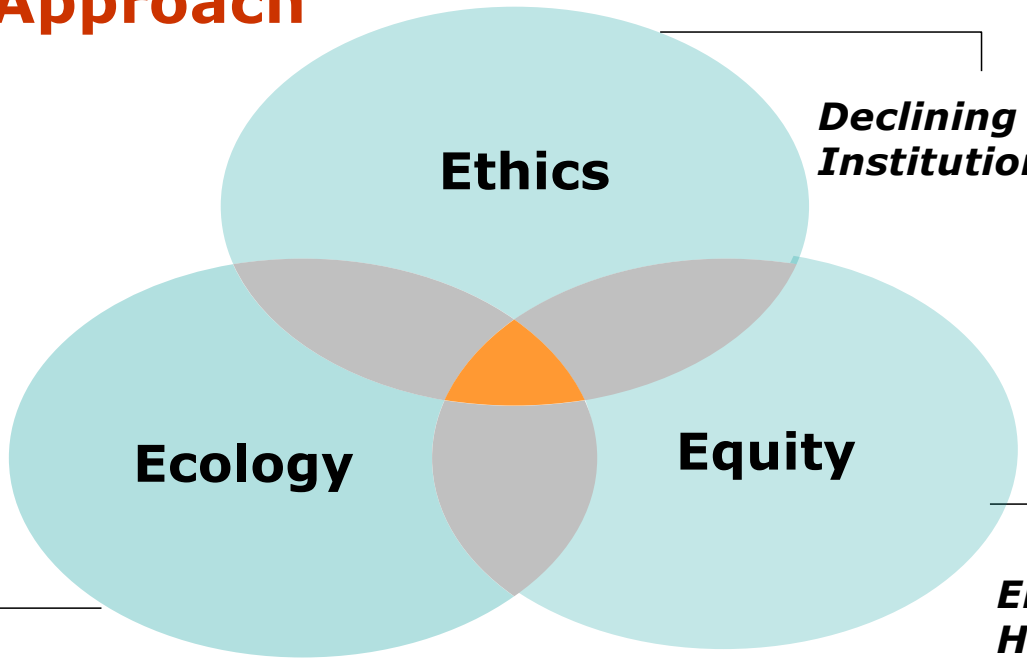
ECONOMIC PHILOSOPHIES AT WORK



Decadence in 3Es

PROBLEMS ≈ OPPORTUNITIES

Holistic Approach

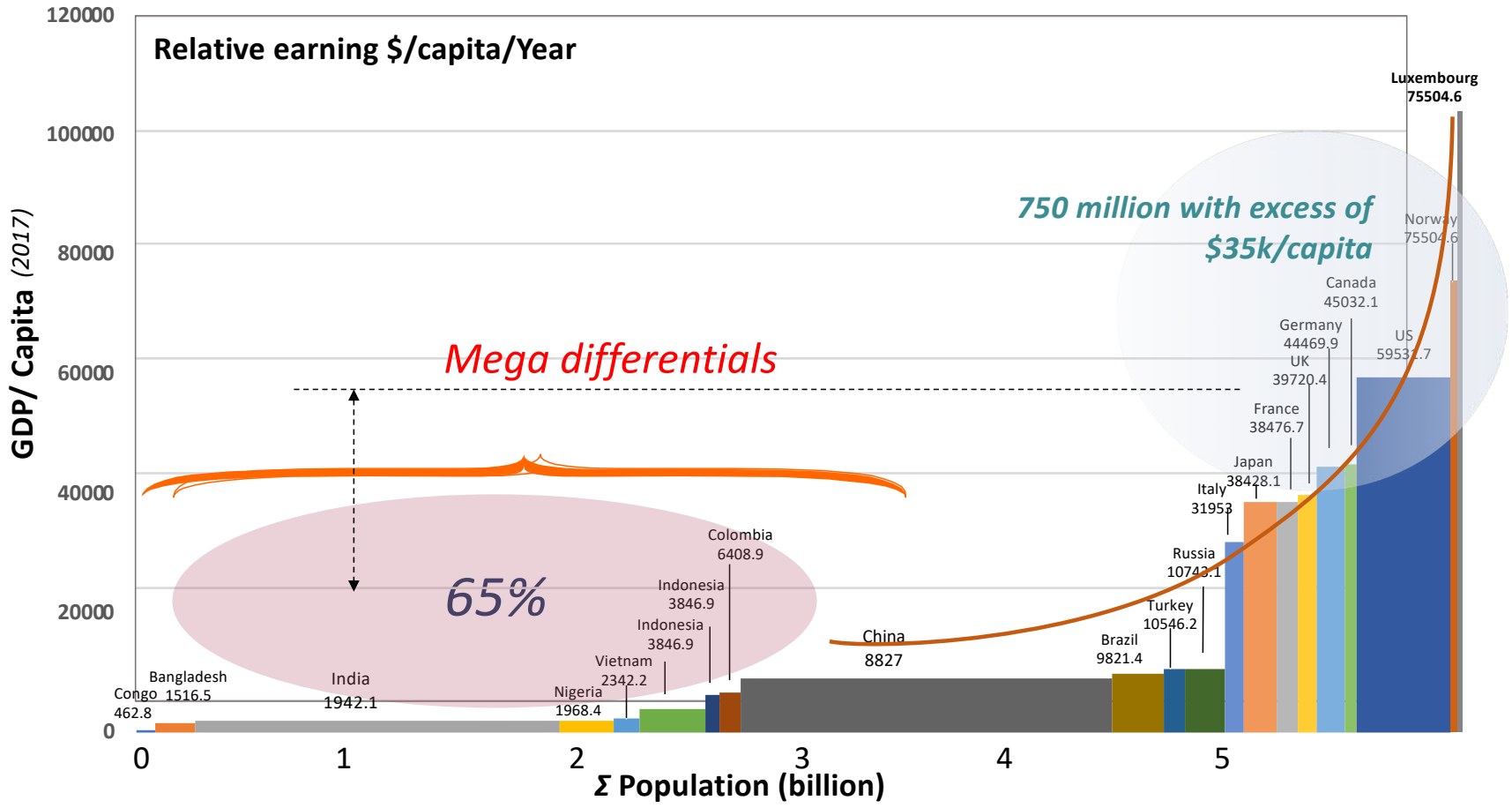


Declining trust in Institutions

Energy, Food and Health for All

Climate change: Sustainable Economic Developed?

Critical Challenge: Mega differentials



Data Source: World Bank

State of our Planet's health?

Fundamentals ?

Widening Gap

1 B Hungry

2 B Malnourished

1B On the line

Rise of slums = Increasing waste-pickers


Phnom Penh, Cambodia


Rio De Janeiro, Brazil

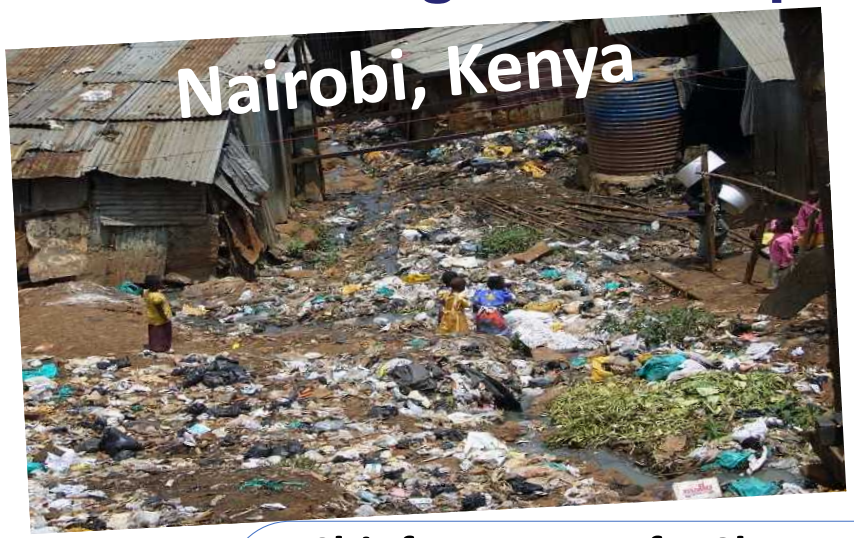

New Delhi, India


Manila, Philippines

Waste of Nations?


Buenos Aires, Argentina

Slums are a globalized problem



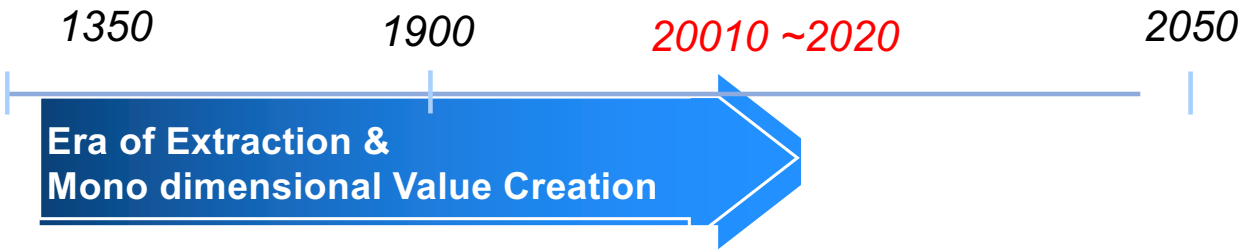
Chief Features of a Slum

- Lack of durable housing
- Insufficient living area
- Lack of access to clean water
- Inadequate sanitation
- Insecure tenure

Generate large amounts of untreated waste

So what happens to the waste?

Mega Challenge = Managing a Mega Transition to avoid Mega disruption



"*Unconstrained*" Processing of Earth's resources

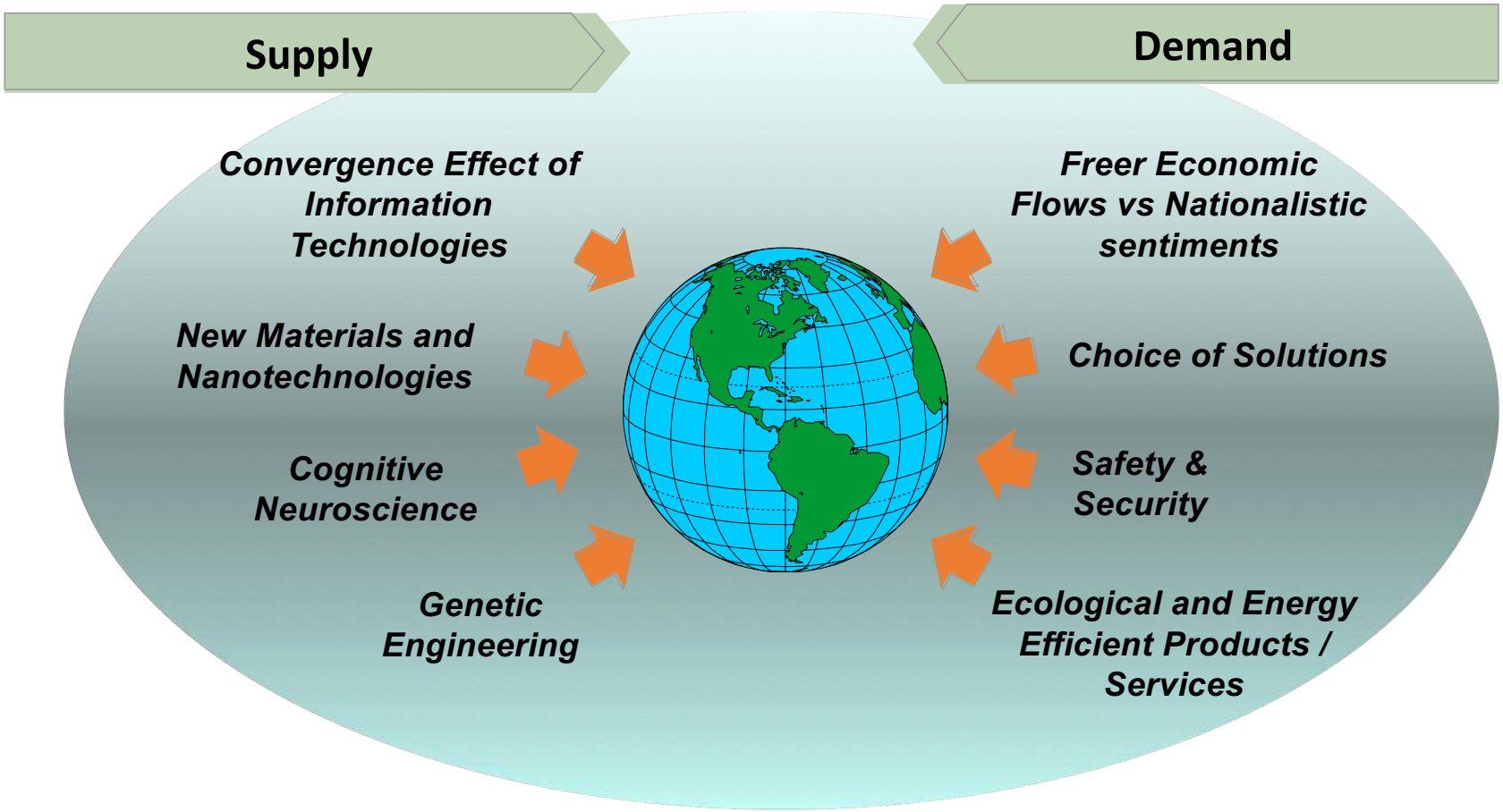
New Relationship of Space & Time

Supply to Fuel Unidirectional Demand

1. Concentrated Economic Growth
2. Ecological disequilibrium
3. Complex Politics of Supply Chain (diffused sources of anger/irrationality

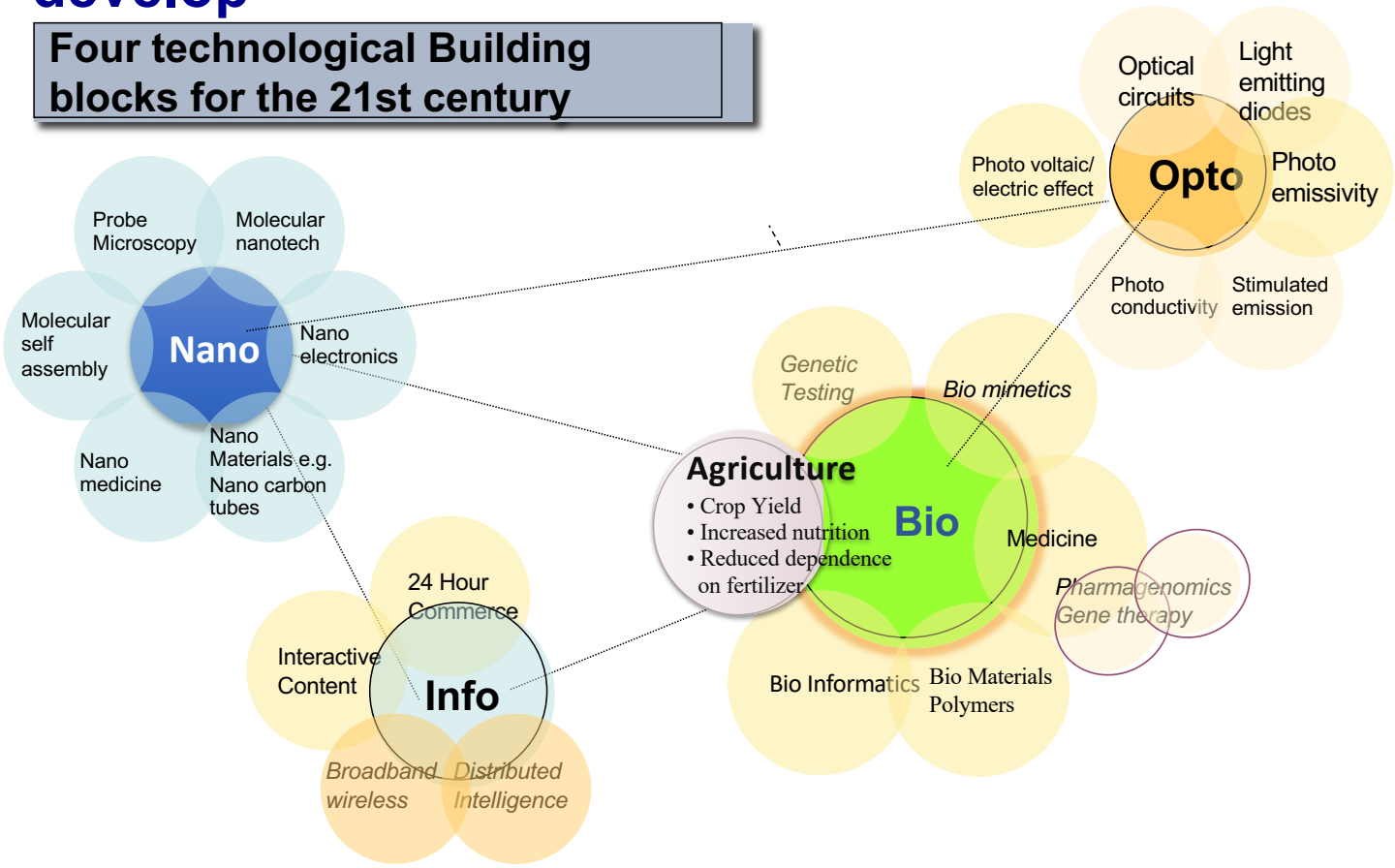
Next Era Paradigm?

The Emerging Economic Environment — *The Big Picture*



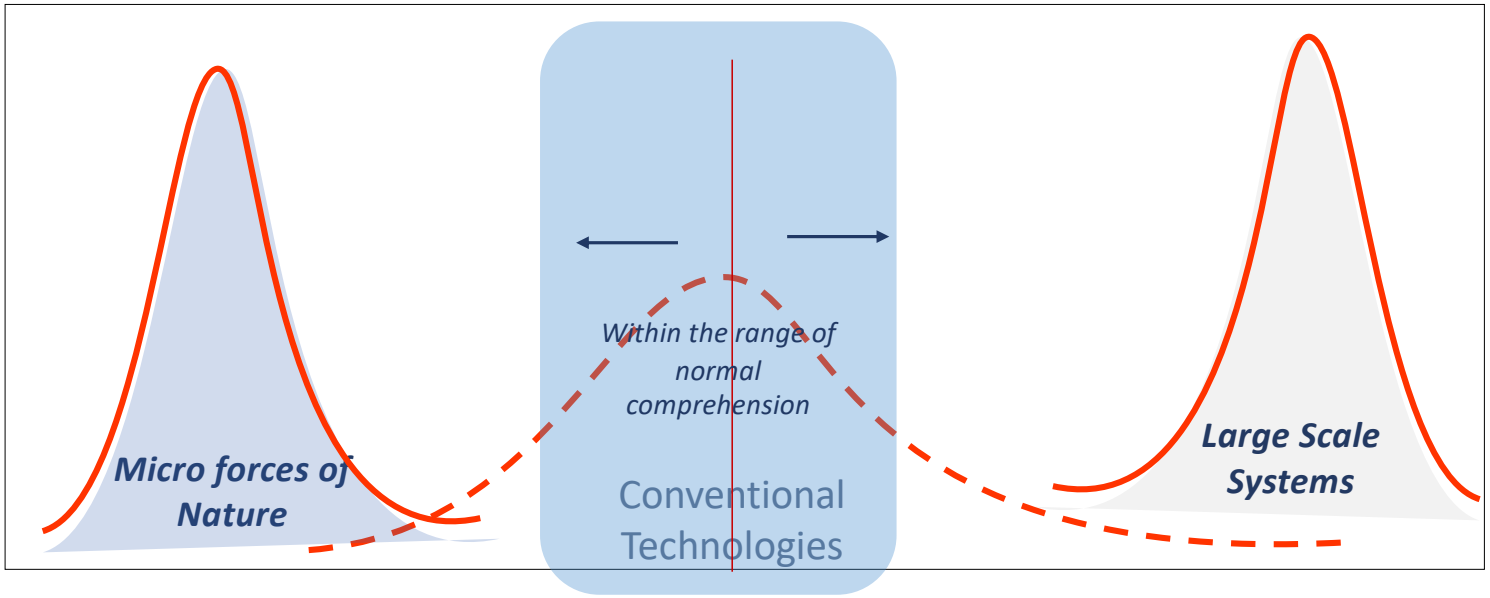
Four technologies will influence how new Global solutions will develop

Four technological Building blocks for the 21st century



Shape of things to come…

Influence of Technologies on Society



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Nuclear forces Nano materials Genetic Sciences

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Technological Focal Point

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Global Logistics Energy & Power Financial Systems www Systems

New Business models are emerging rapidly

Largest **retailer** without retail stores

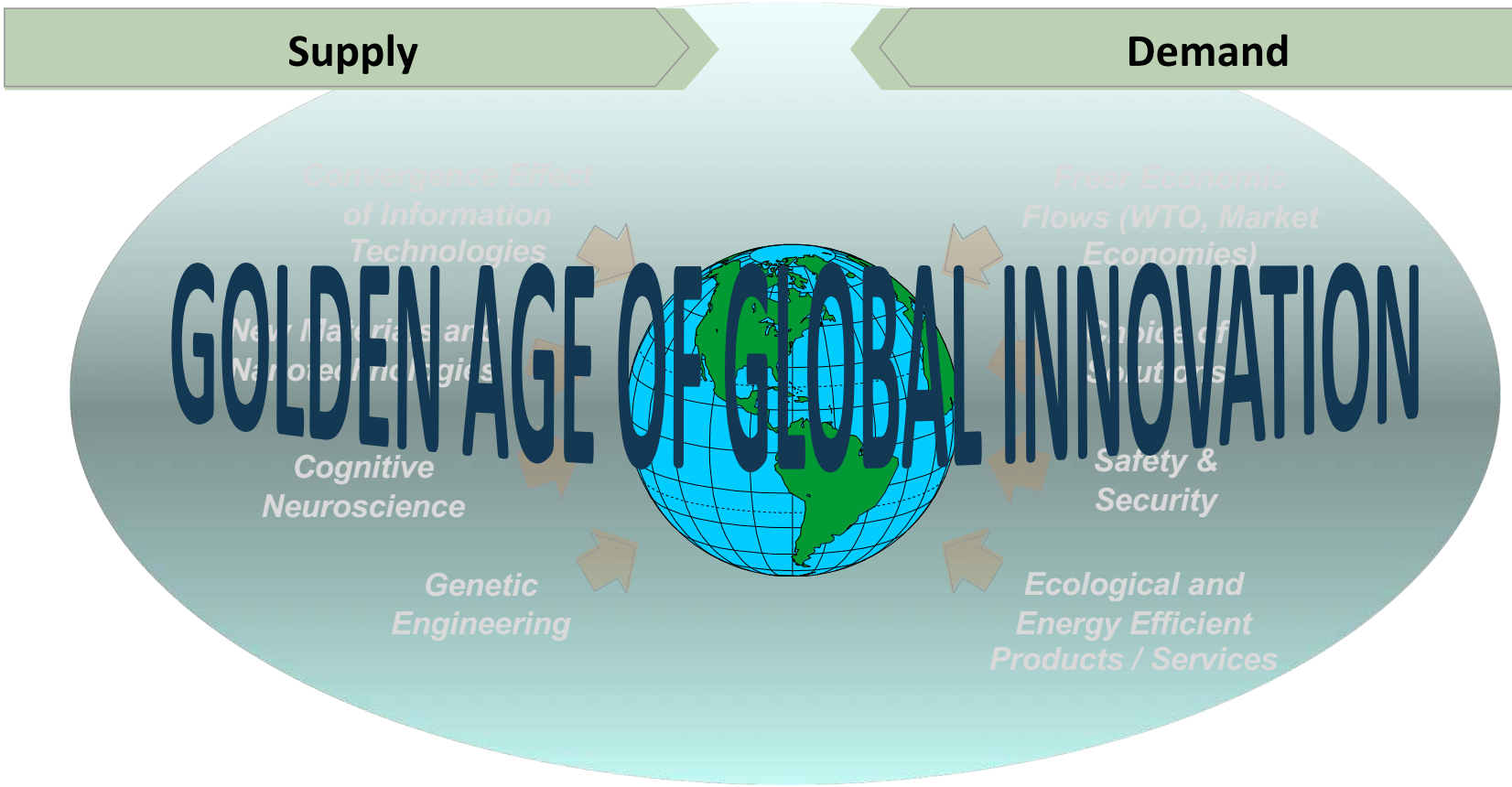
Largest **Taxi Company** without CARS

Largest in **hospitality** without real estate

Largest in **social media** without content

Largest retailer and developer of SMEs

The Emerging Economic Environment — The Big Picture



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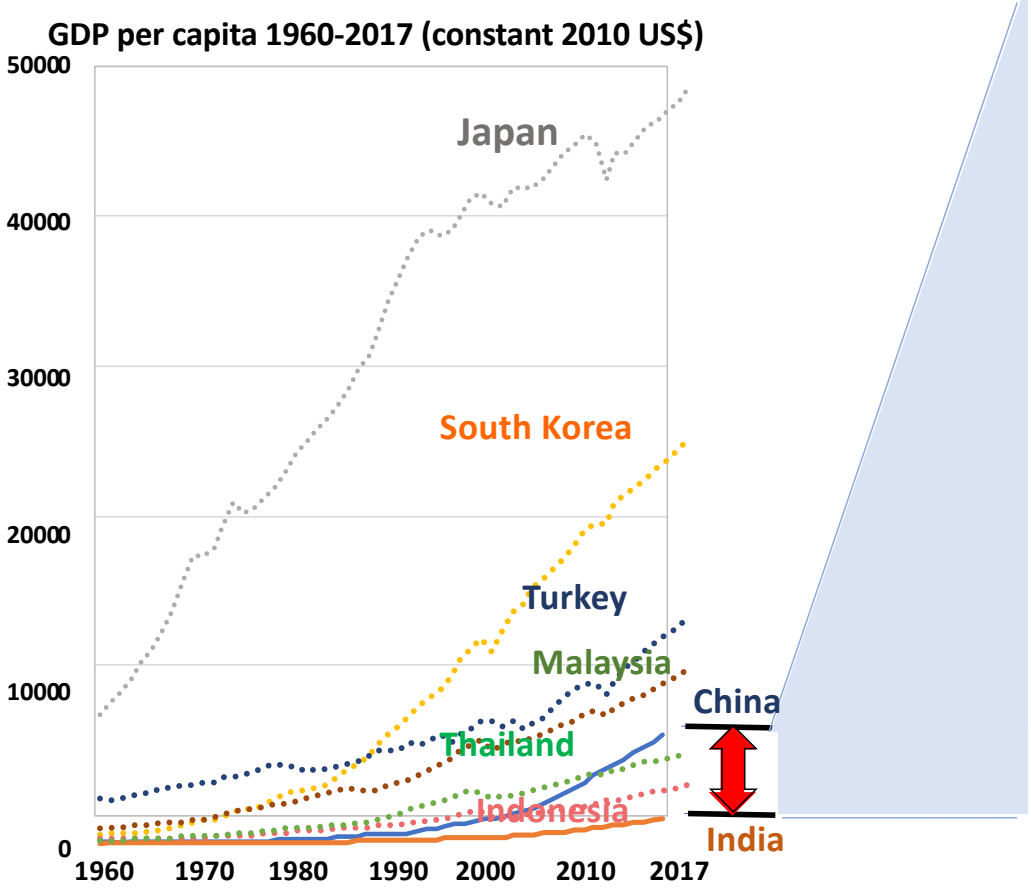
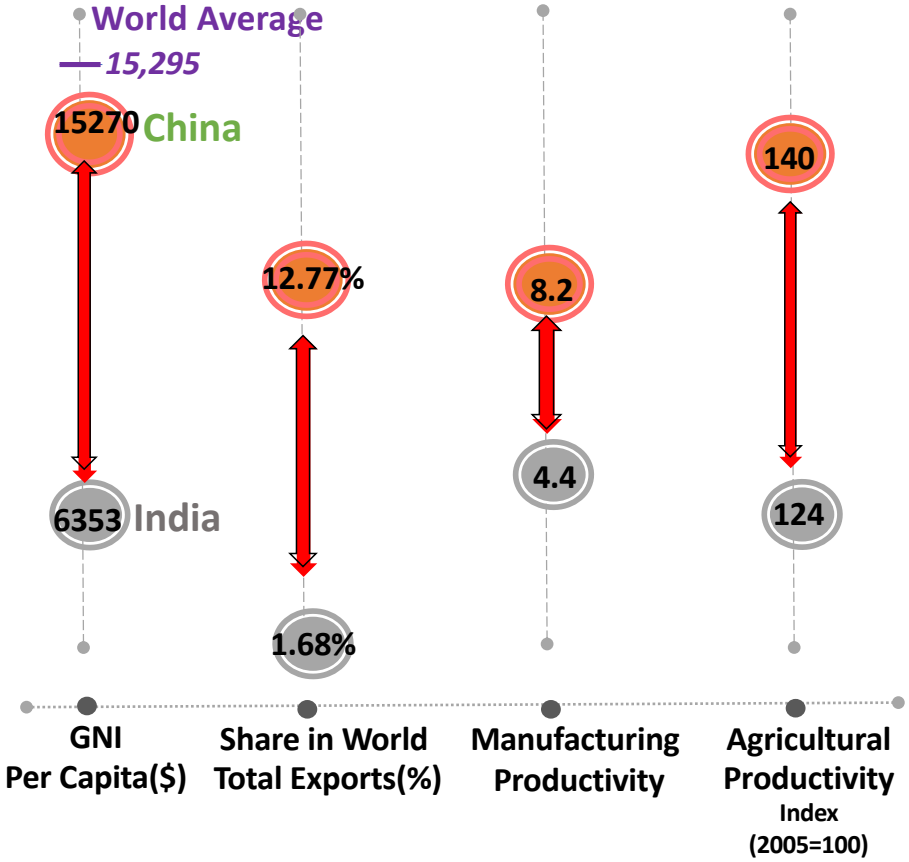
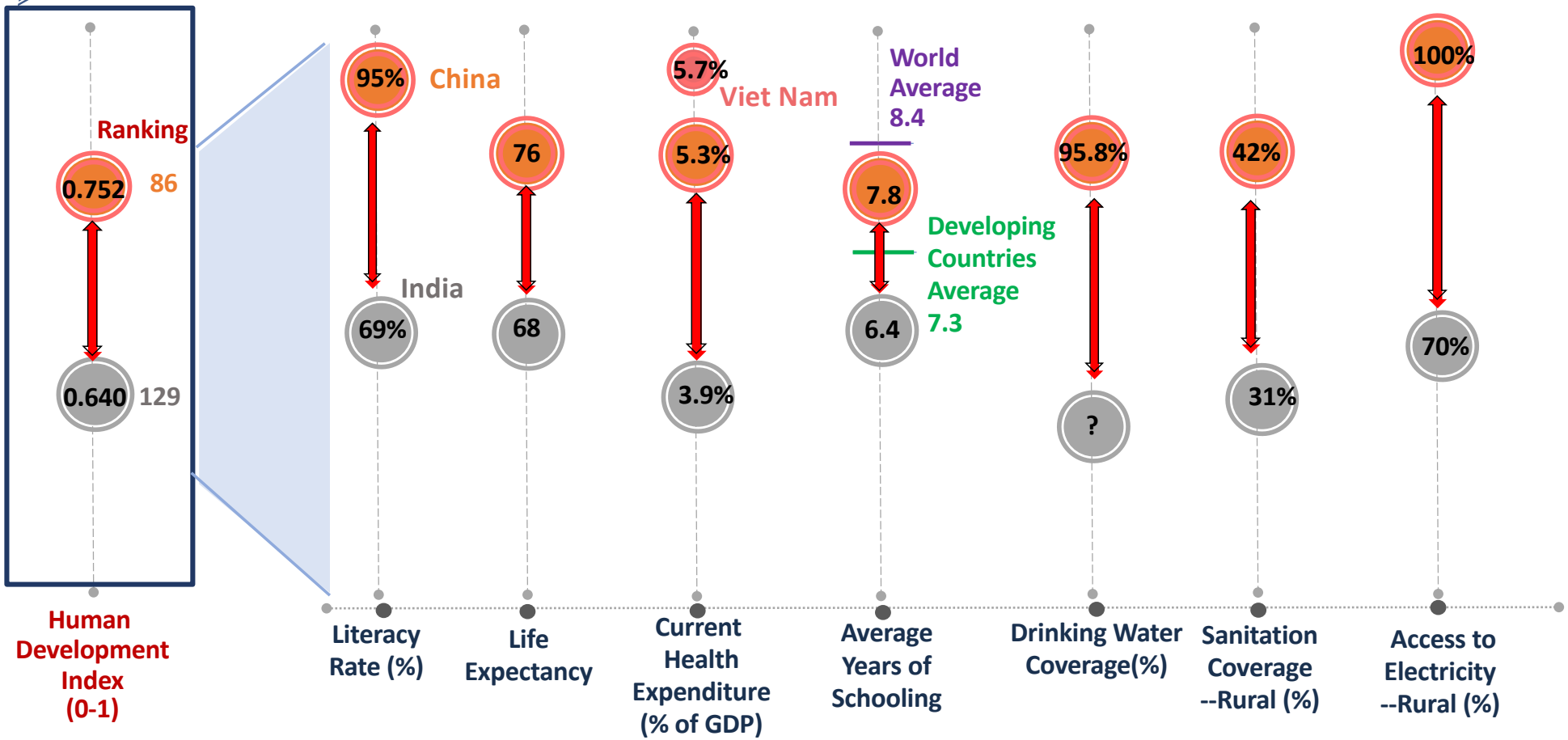
India's economic performance has lagged other Asian nations





Data Source: World Bank/World Trade Organization/ The Conference Board/United States Department of Agriculture: Economic Research Service

Gaps in Social Infra-structure are serious = "Economic Drag?"

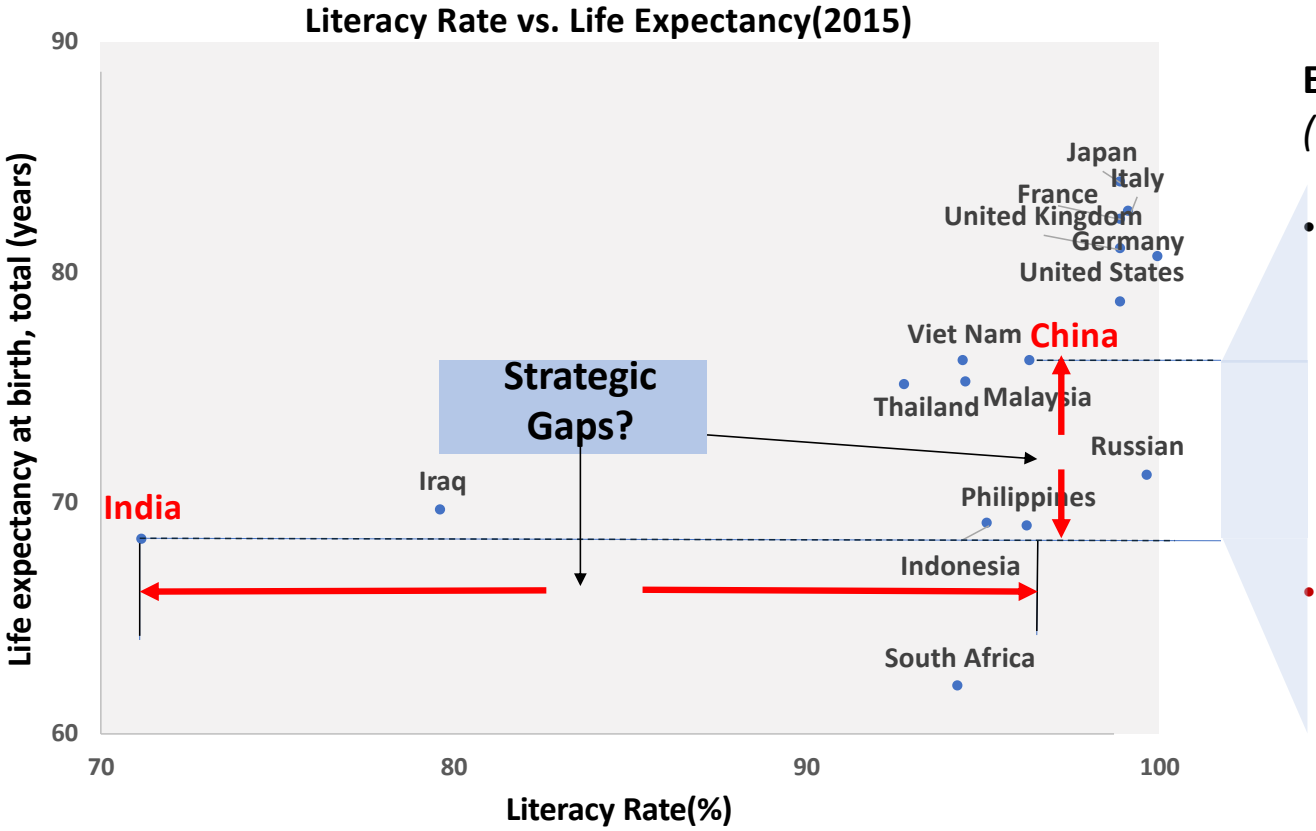


Data Source: Human Development Indices and Indicators: 2018 Statistical Update/ WHO--UNICEF JMP/World Bank

Trade Balance has continued to be in the red

Data Source: World Bank

Primary & Secondary Education powered by AI is essential

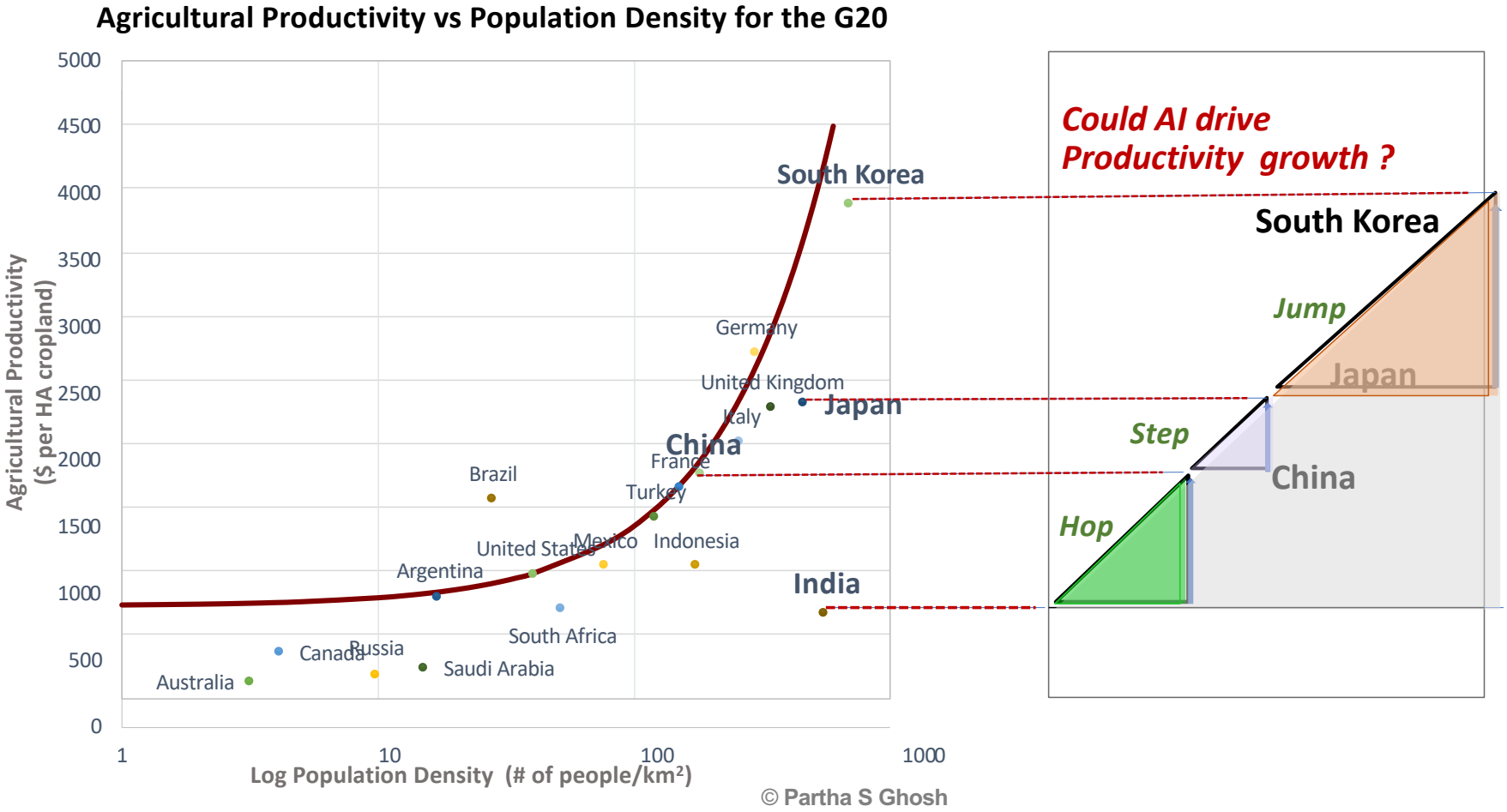


Educational Programs:
(examples from China)

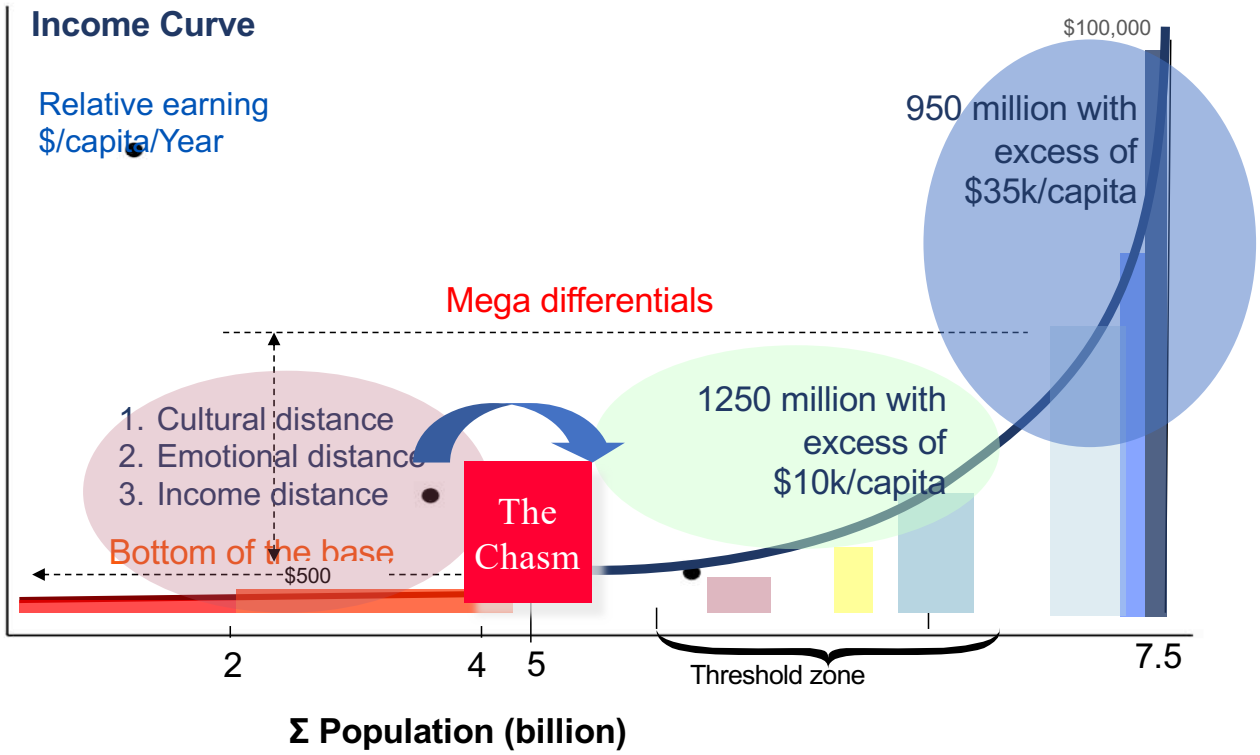
- Law on Nine-Year Compulsory Education, calls for achievement of the 'two basics': universal enrollment among school-aged children (6-15 years) and full literacy among those under the age of 20.
- "Teaching Curriculum for Full-time Primary and Secondary Schools (Pilot)": include subjects targetted to solve local problems

Data Source: World Bank

Particular focus should be on Agricultural Productivity

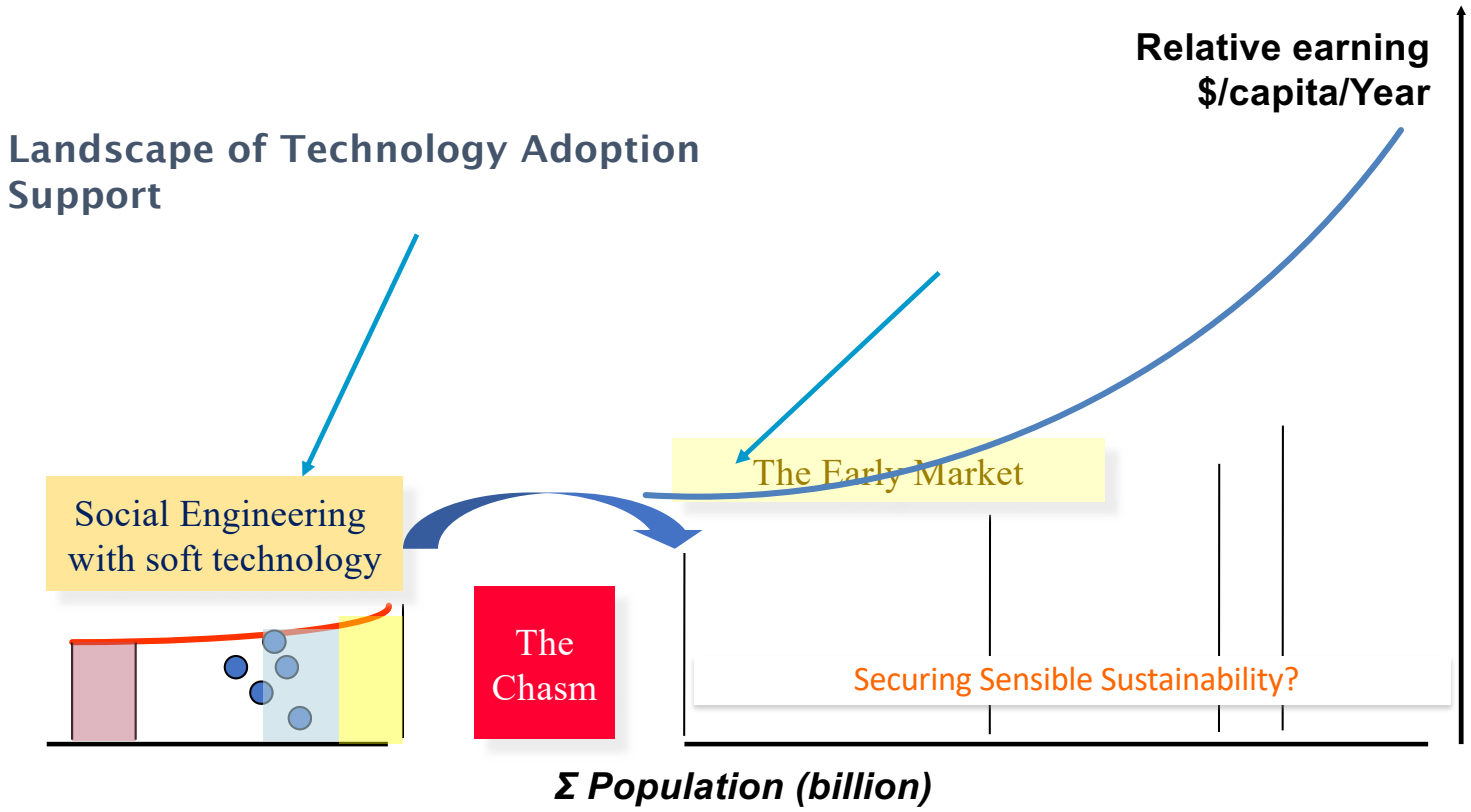


Critical Challenge: *Mega differentials > Down-scaling technologies*



* Relative to the lowest cost producer

Significant social engineering will be required so that successful innovators do not migrate away from under-privileged environments

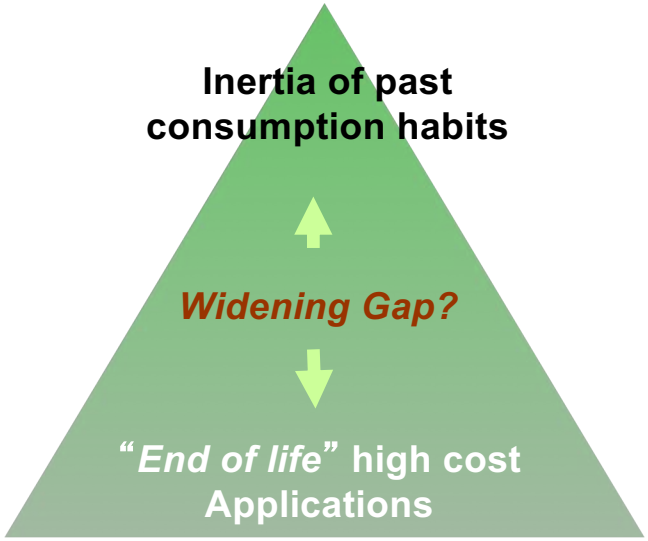


- India must explore ***a new approach*** along multiple dimensions

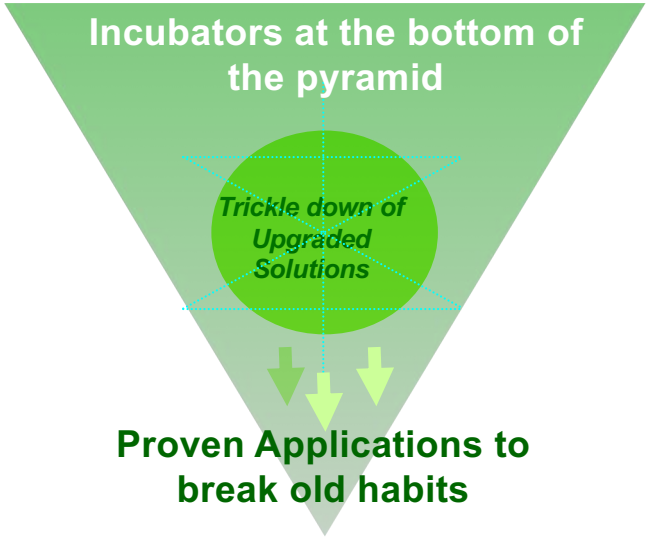
Need for a New Approach ?

Embracing the base of the Pyramid as platform of Innovation of new value propositions

Current Obstacles of Typical Socio-economic Pyramid

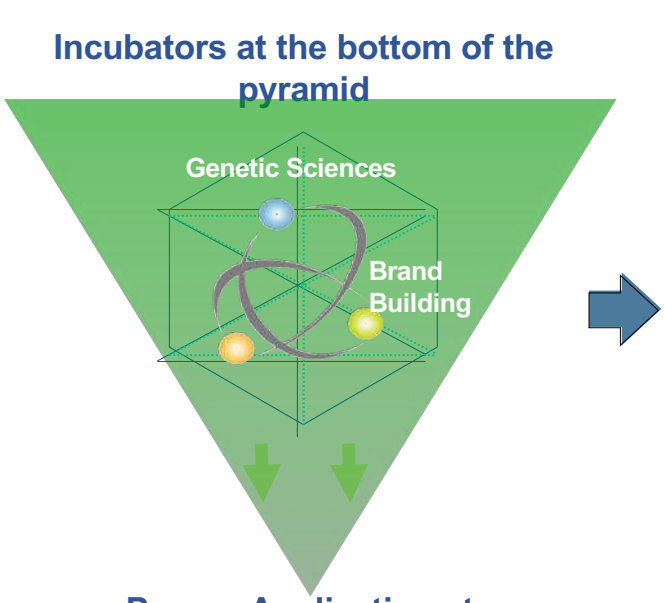


Experiments at the top of the Inverted Pyramid

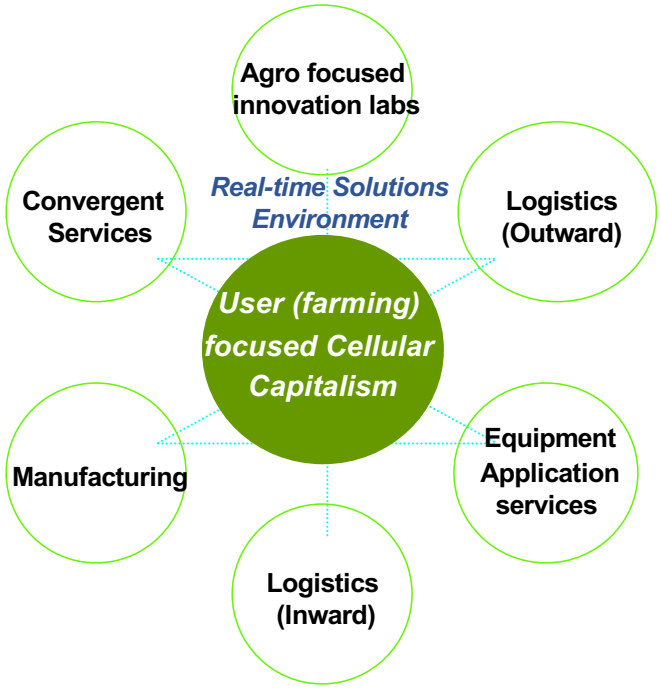


Economic Implications could be significant while enabling multi-level innovations

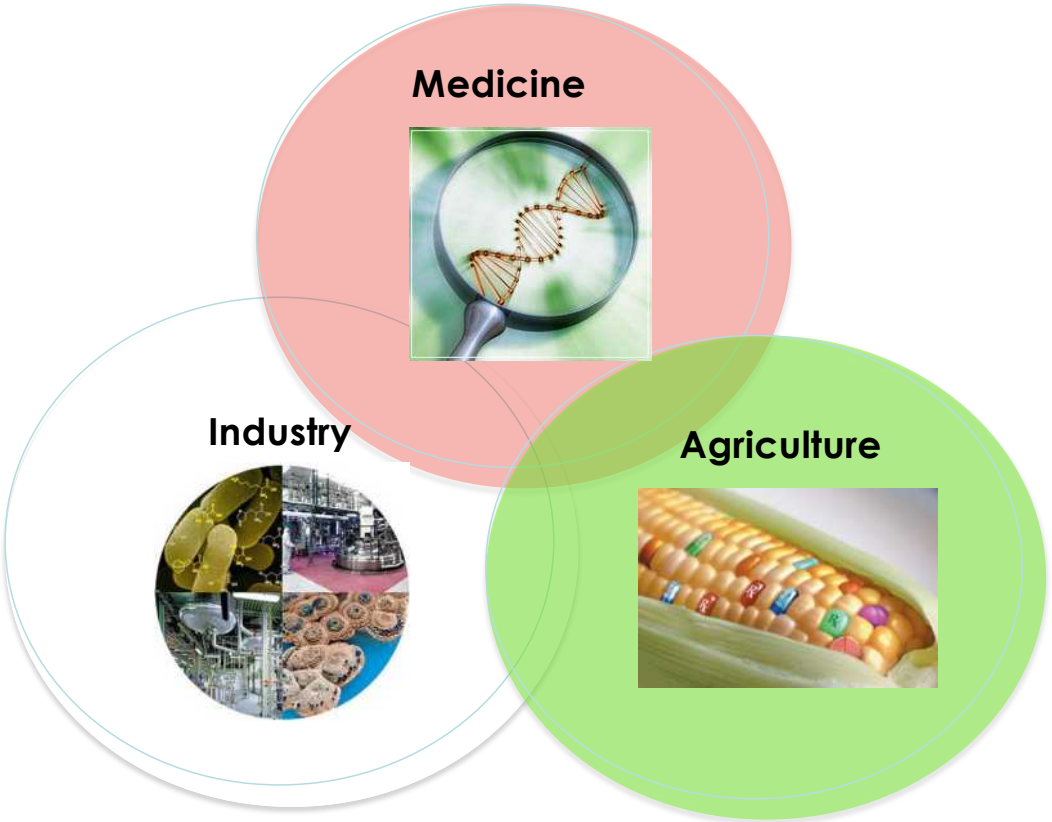
Inverted Pyramid Structure



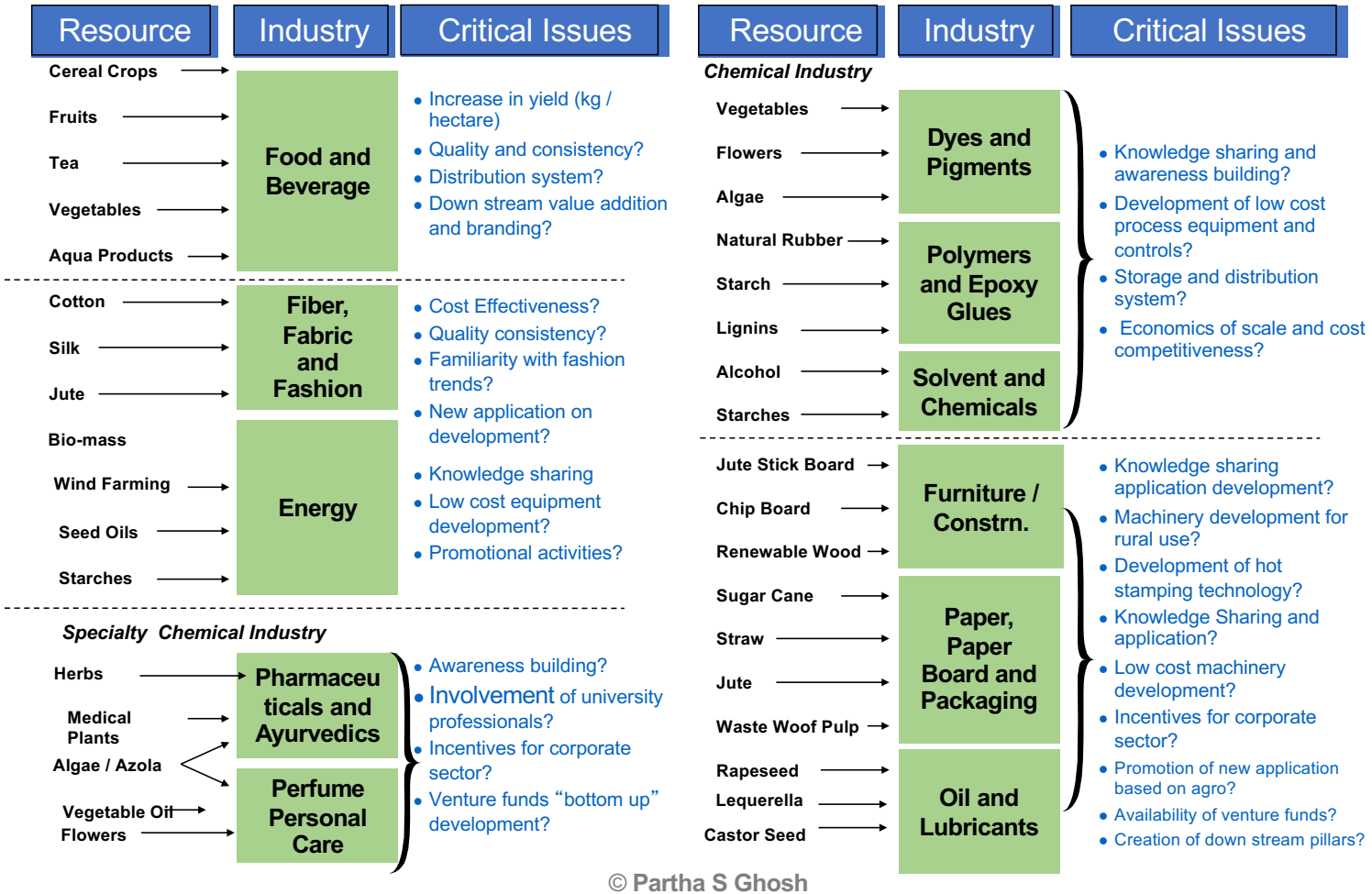
Networking Structure



Technology & Innovation in Biotechnology



For Example: *An Agro Complex?*



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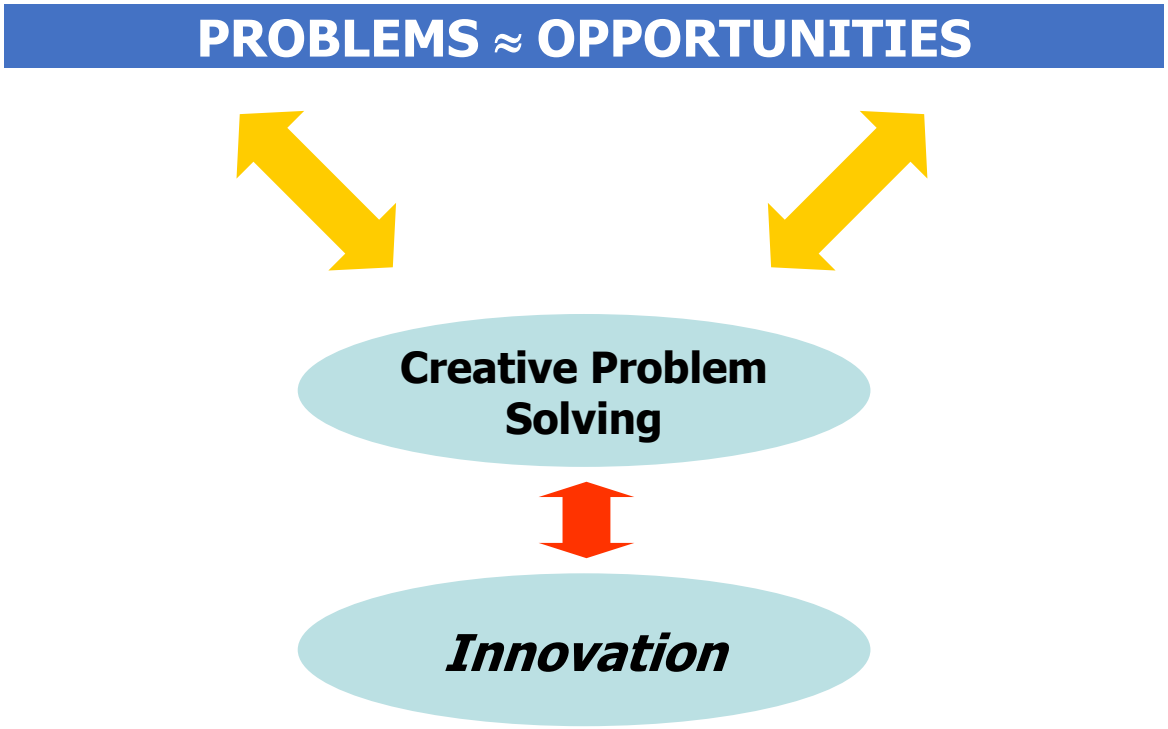
Innovation and Enterprising ≈ Creative Problem Solving



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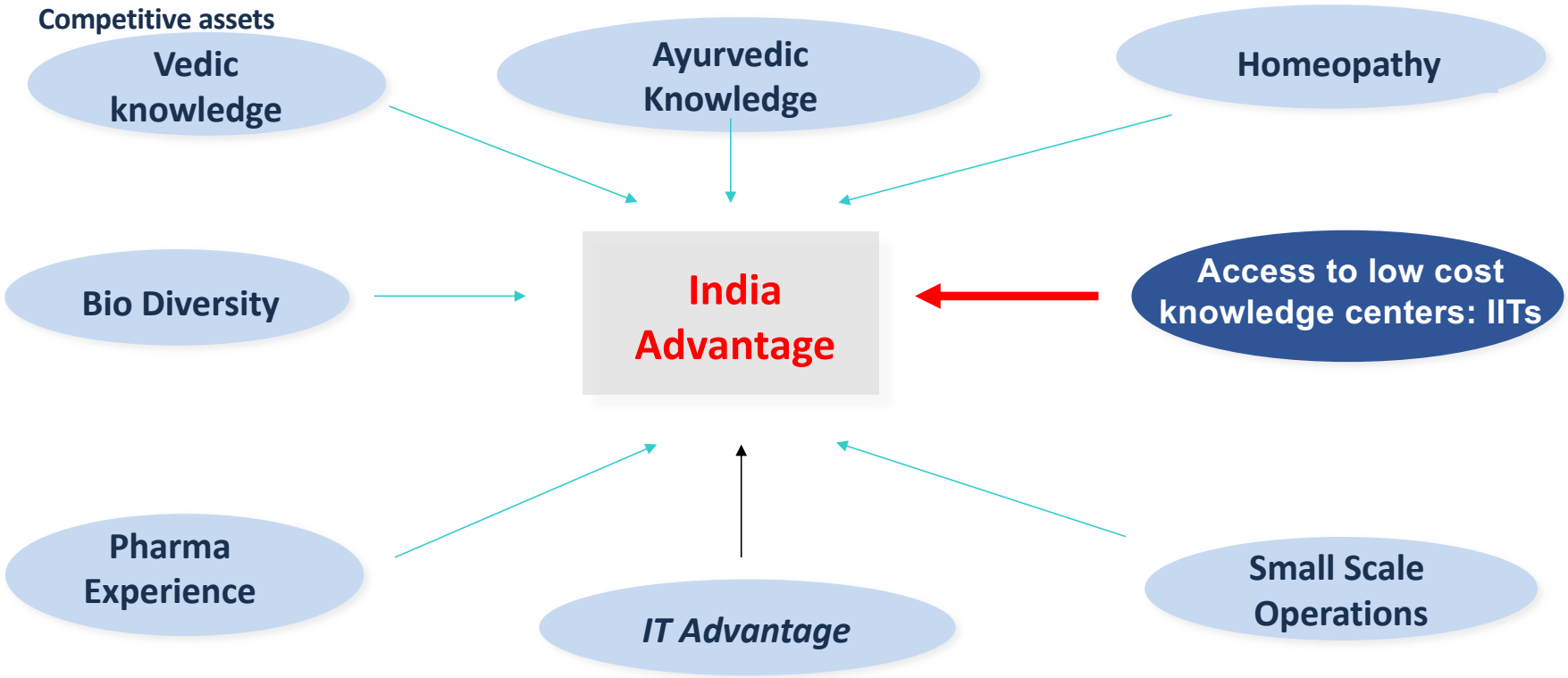
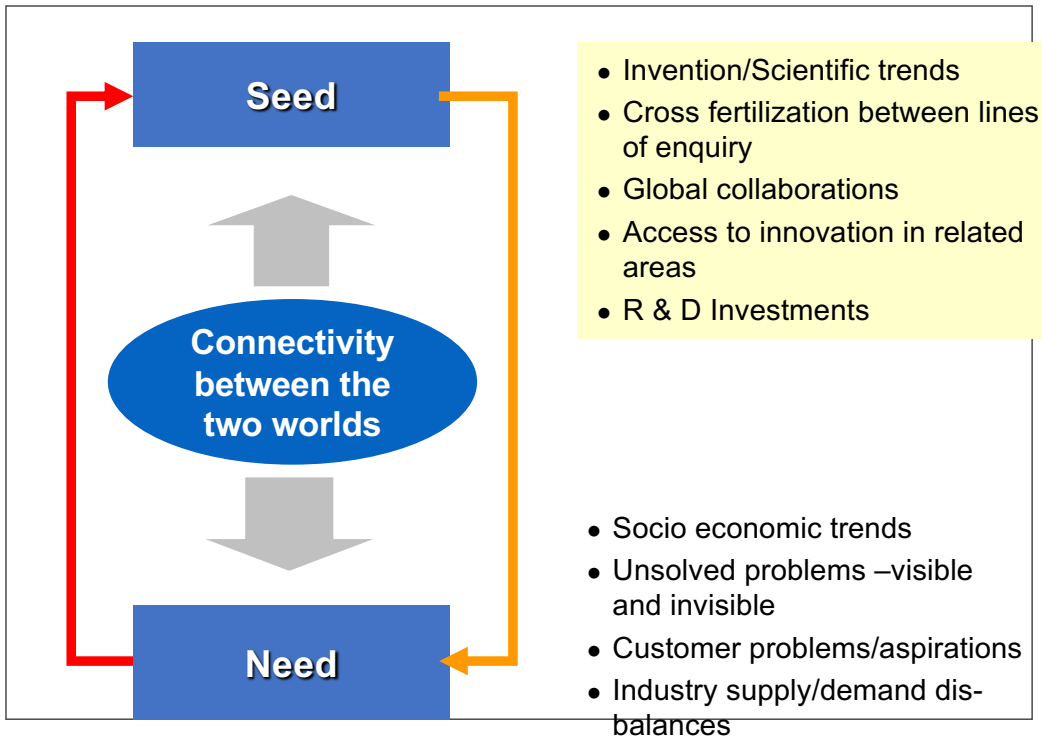
Accordingly promise of to secure “India Advantage” could be defined

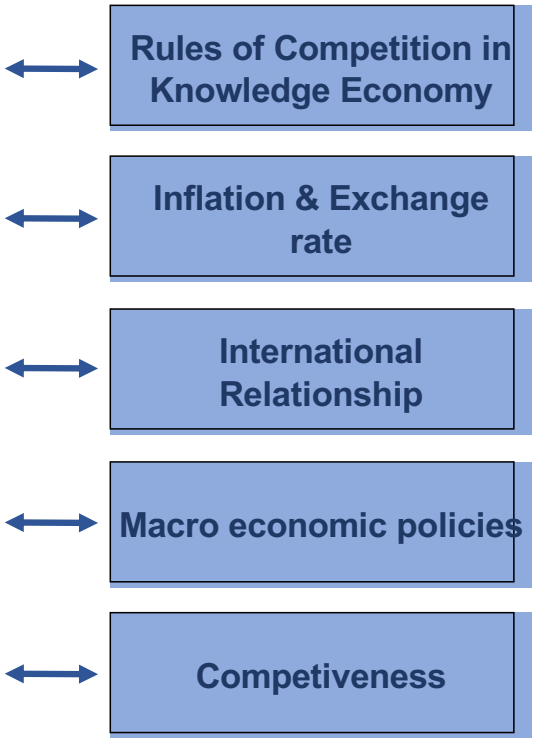


Multiple factors (both on seed and need sides) typically work together to impact your mindpace



- Invention/Scientific trends
- Cross fertilization between lines of enquiry
- Global collaborations
- Access to innovation in related areas
- R & D Investments

- Socio economic trends
- Unsolved problems –visible and invisible
- Customer problems/aspirations
- Industry supply/demand dis-balances



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Putting Innovation in the context of the Modern Civilization

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2. Civilization at the point of inflection – Need for breakthroughs?
3. Challenges in developing nations are even more significant
4. **Opportunities to think fresh in privileged and underprivileged environments? It is your turn?**

Need for mega scale innovation = Global Opportunities ahead?

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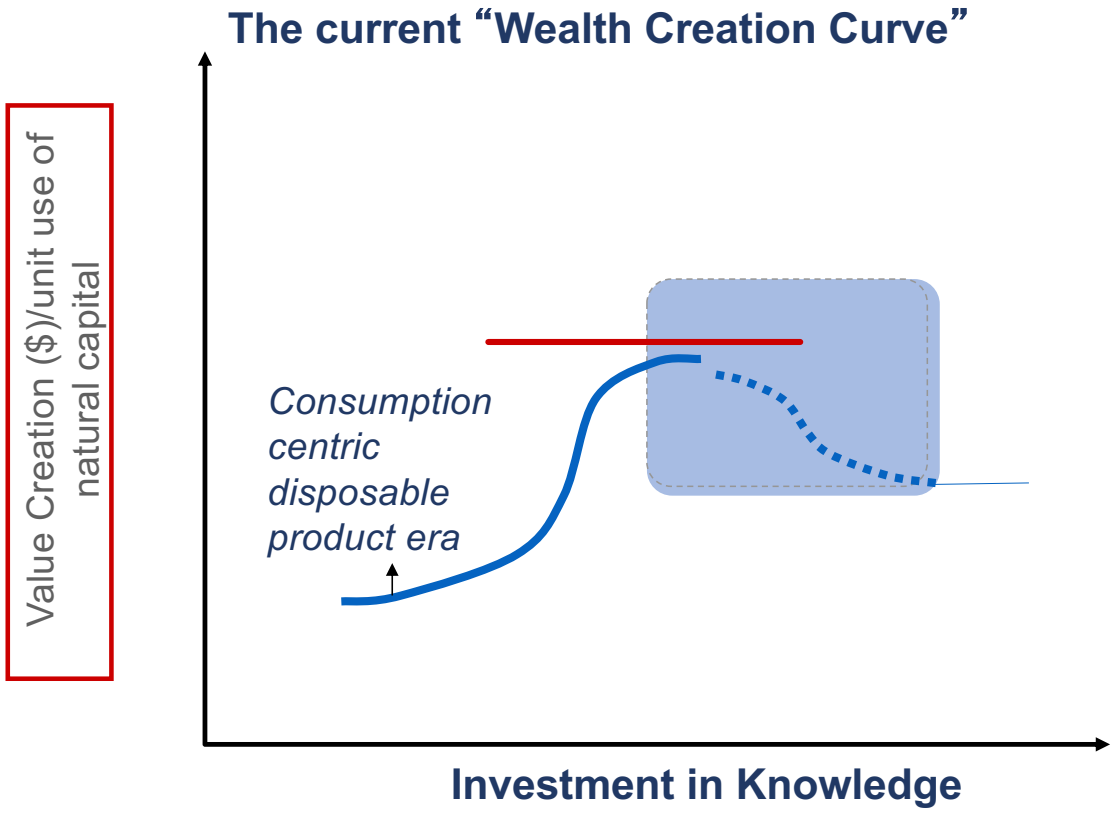
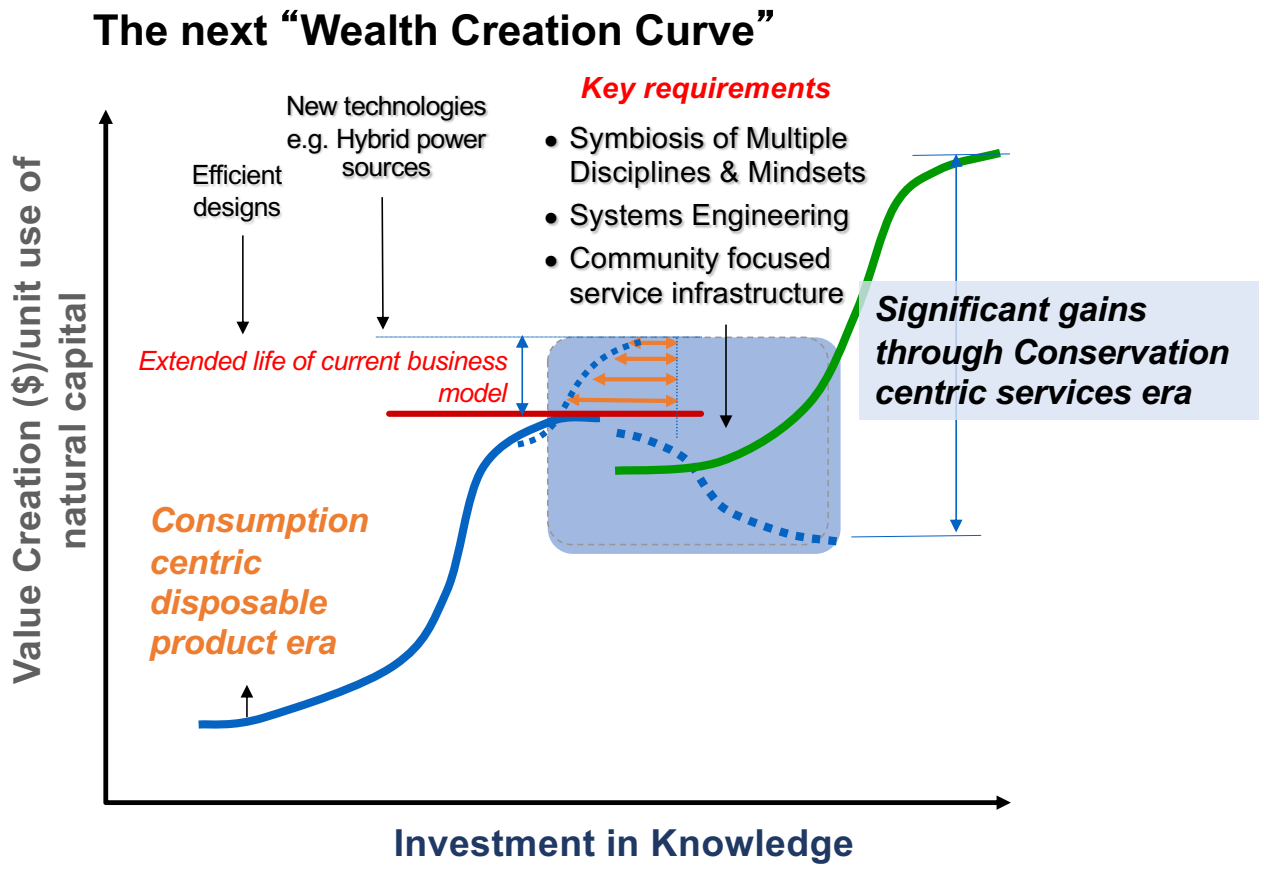
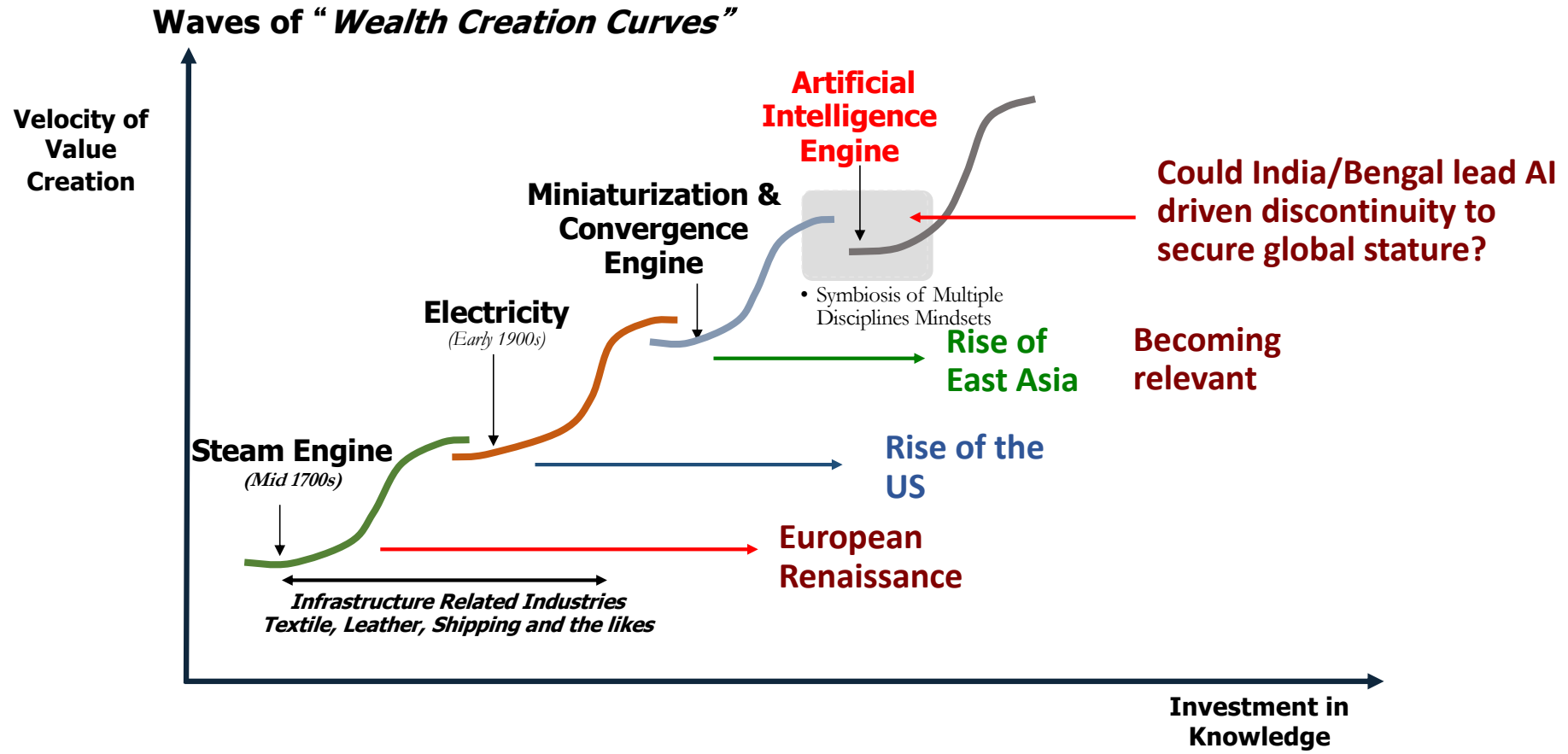
The New S-Curve for Economic Advance - *The Challenge of Transformation*



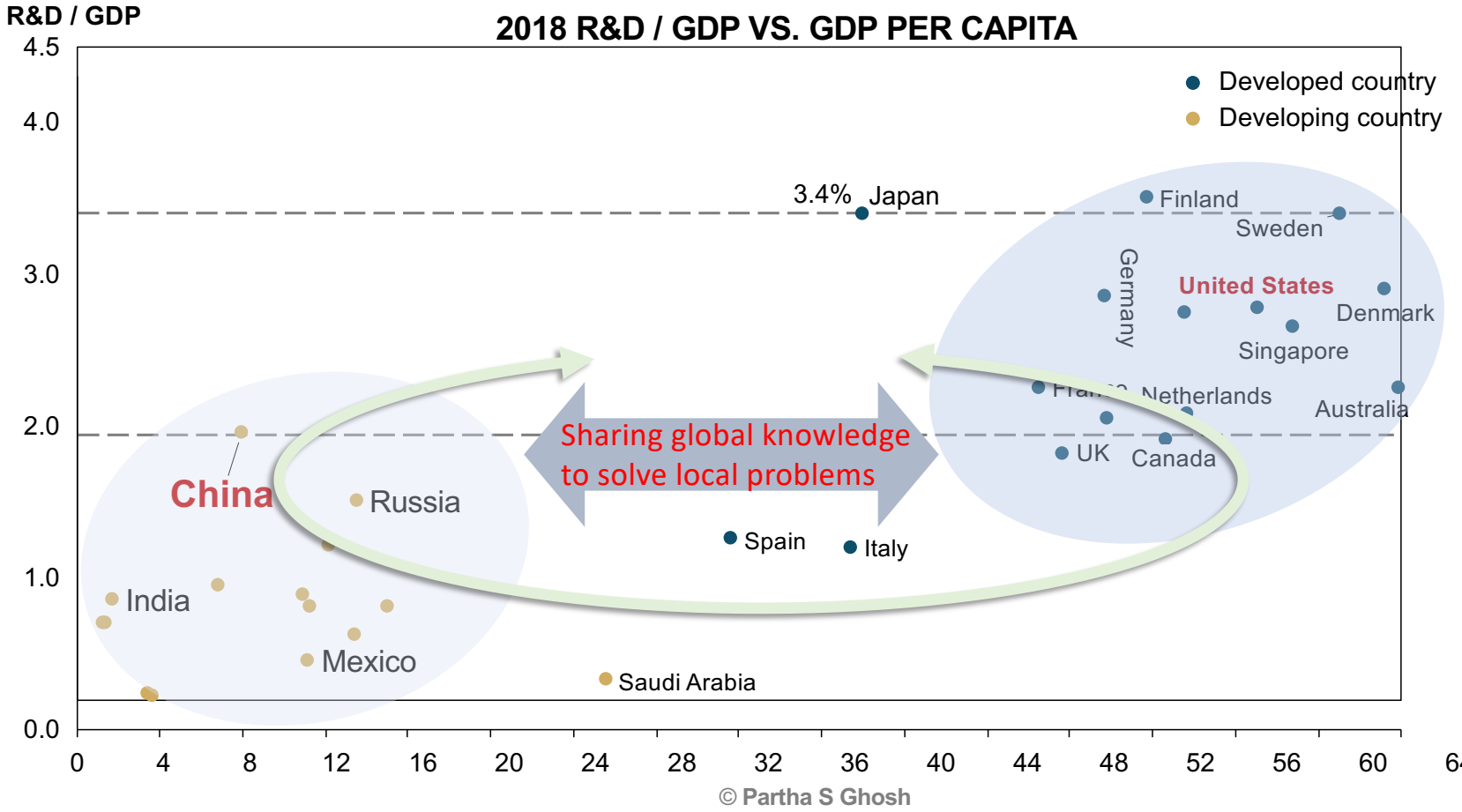
The New S-Curve for Economic Advance - *The Challenge of Transformation*



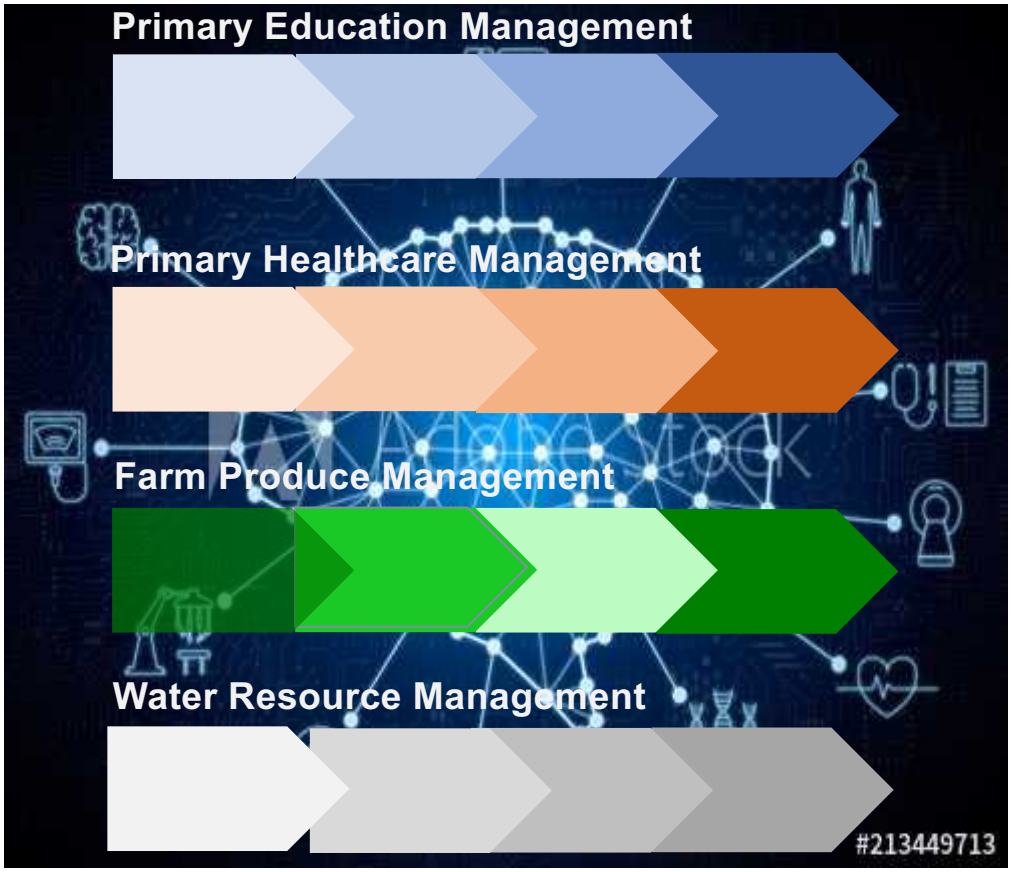
So could India/Bengal become AI-led problem solver for global issues?



Fair circulation of knowledge between advanced and emerging nations could boost Global Liquidity of IQ

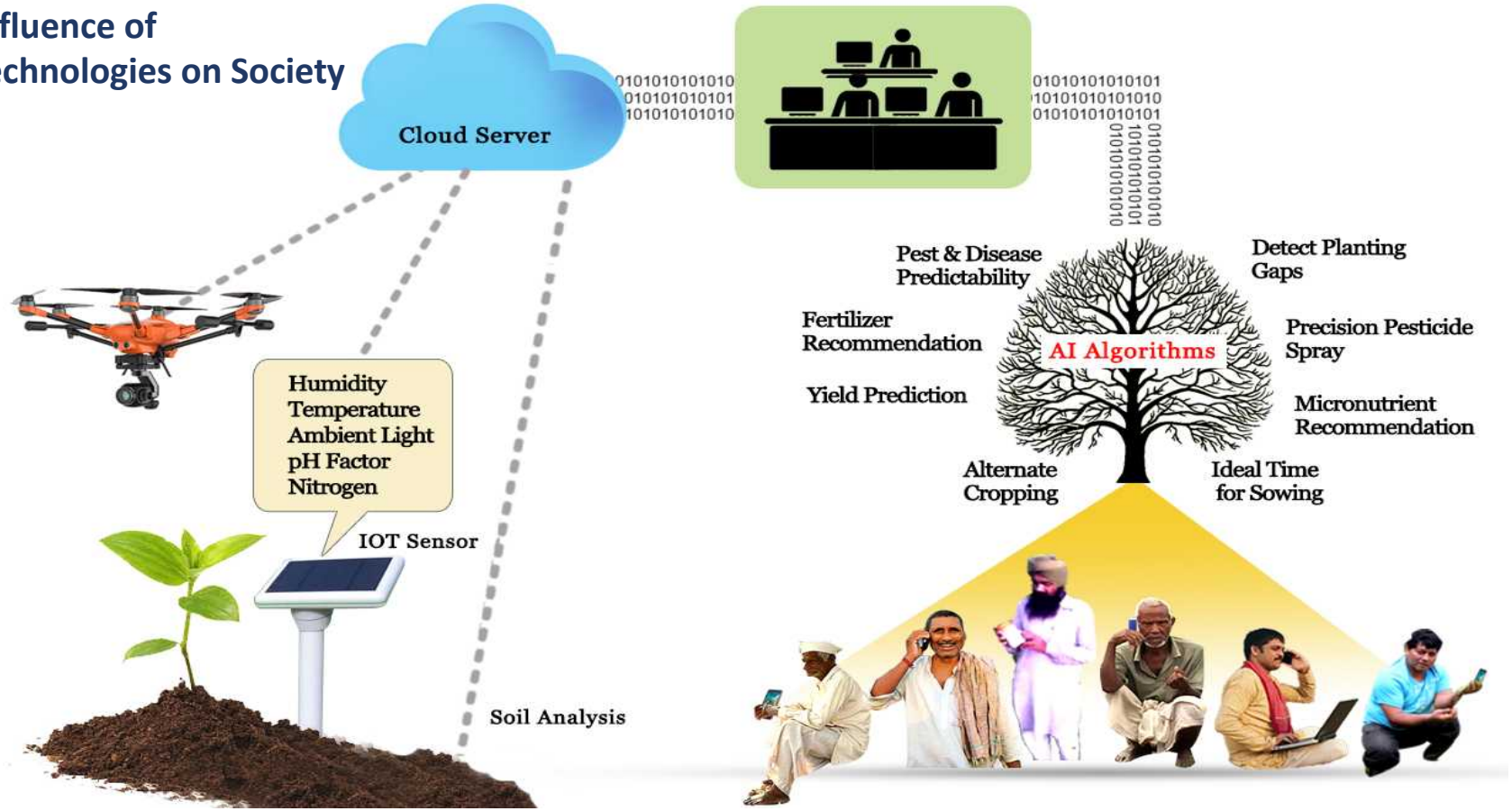


AI technologies to boost social infrastructure



Application of AI
▪ **Differentiated and individualized learning** ▪ **Universal access to Quality Education** ▪ Automate admin tasks ▪ Tutoring and support outside the classroom
▪ Managing Medical Records and Other Data ▪ Digital Consultation ▪ Nutrition/Medication Management ▪ Health Monitoring & Healthcare System Analysis
▪ Crop Grading ▪ **Yield prediction based on satellite imagery** ▪ Recognize crop diseases and pest damage ▪ **Help precision application of pesticides**
▪ Understand the real-time water loss and misuse ▪ Design comprehensive distribution networks ▪ Forecast groundwater reserves

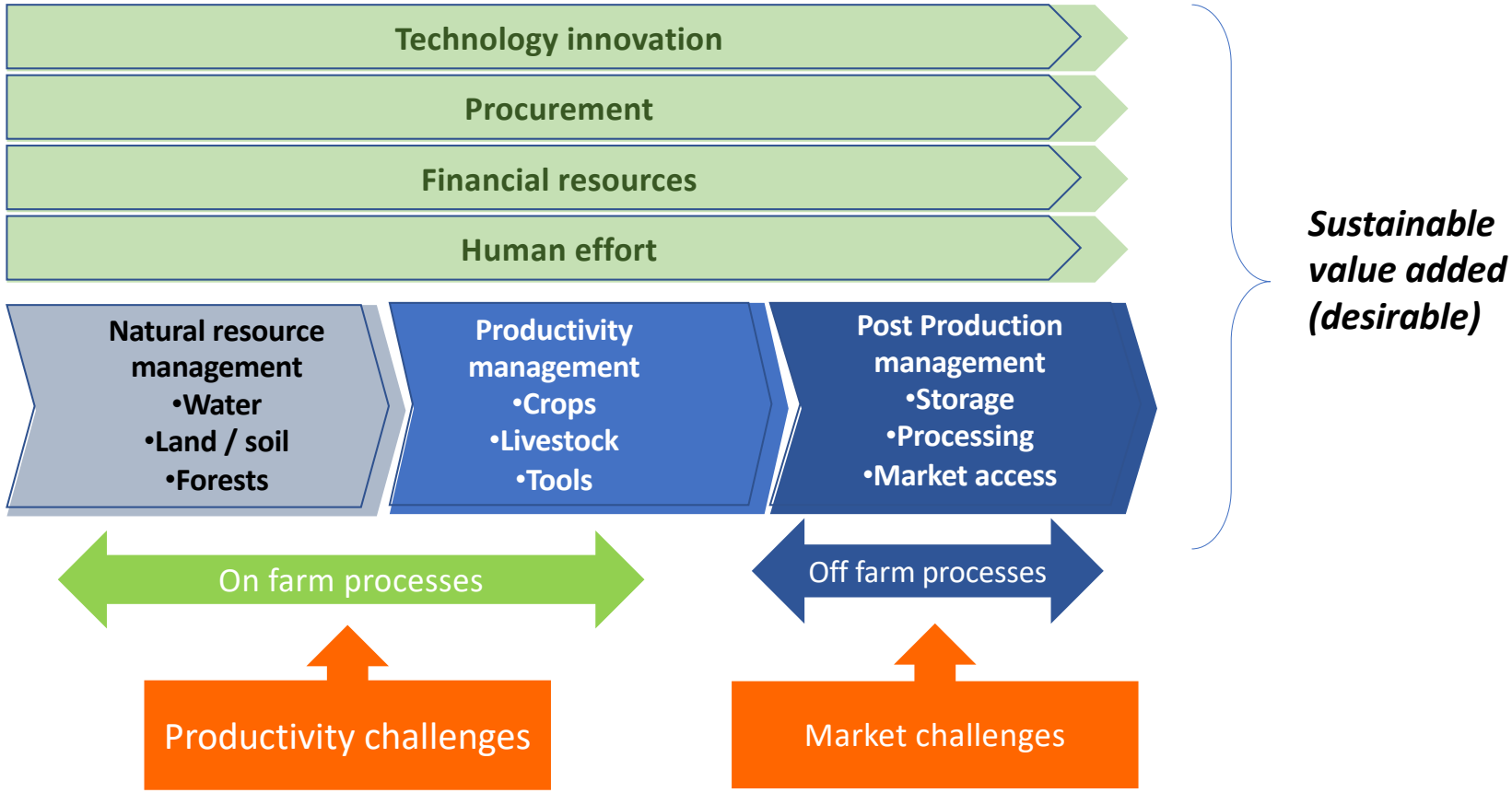
For example through application of AI productivity of agricultural sector could improve several folds in the developing countries



Enabling communication for the Global rural community

Influence of Technologies on Society

Innovation in agriculture value chain



Furthermore developing reverse logistics process could open up new Industries

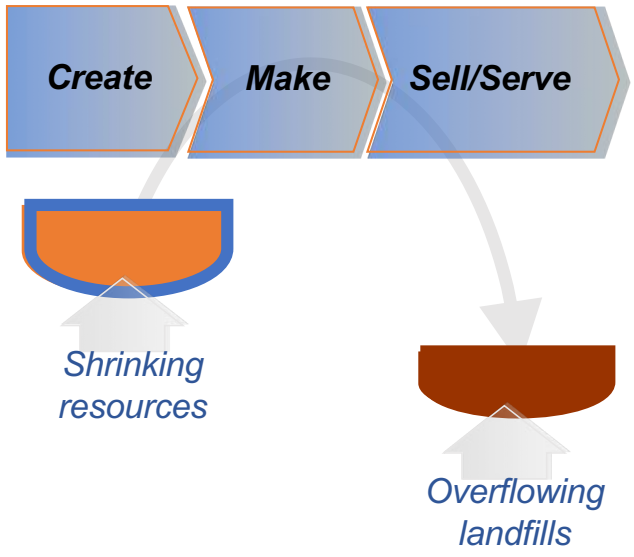
Creating An Industry *(Reverse Logistics)*

The Challenge of Creation of a New Industry:

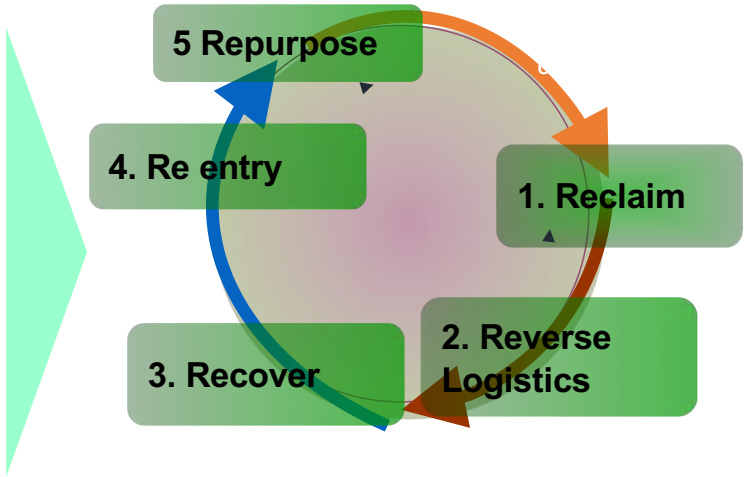
1. Distributed to concentrated
2. Rules of engagement
3. Stewardship

Towards Circular Economics= *Play of 5Rs*

Old paradigm: Linear Business Model



Possibly Paradigm: Circular Business Model

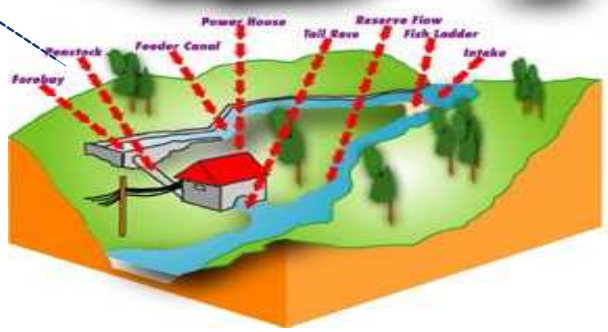


AI technology to operationalize hybrid energy infrastructure

Smart National infrastructure

Decentralized Villages

Local electrification
Solar, wind, geothermal
Small or micro hydro
'Hand crank' generators



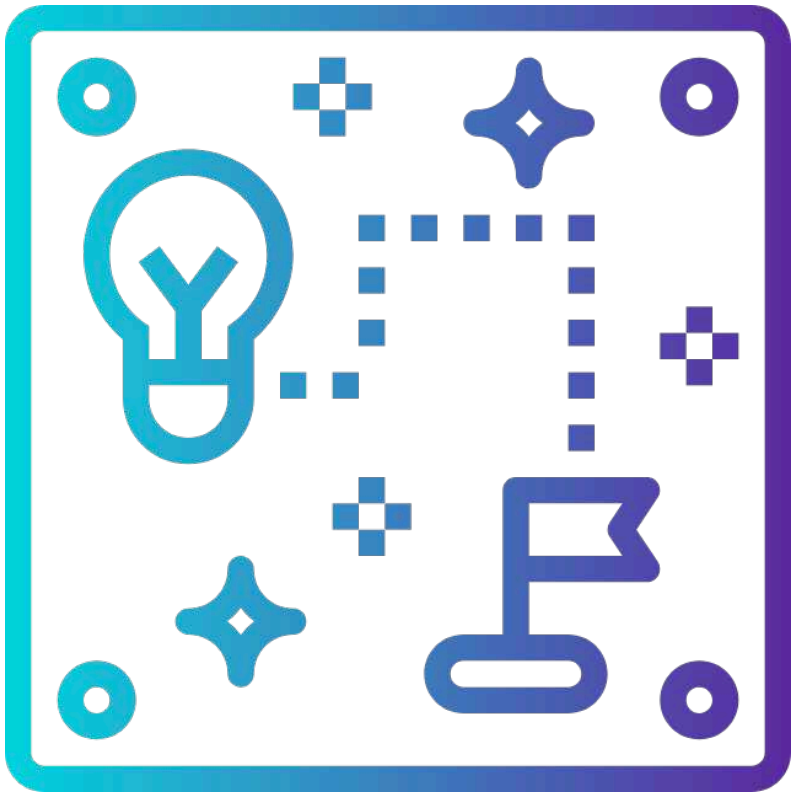
Will require heavy government funding

- ***China invests $9.50 for every $1*** *that India invests in infrastructure*

Enabling Multi-dimensional AI driven Programs at village

Will require holistic approach

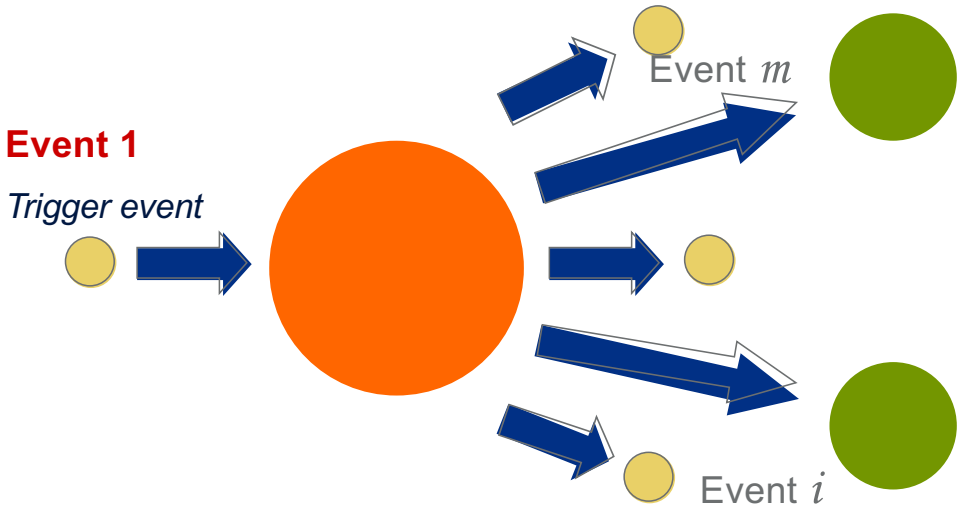
Paths could be zigzag…. Persistence, Passion and Principles should be the key drivers.. 3Ps



Homework 1

***Anatomy of Innovation**: Choose the most important three innovations (e.g. iPod, internet, light bulb, plastics, steam engine and paper) preferably any In India you are familiar with that you think have affected your life and then analyze how the different factors in interaction with each other enabled those innovations.*

Anatomy of Innovation
Fission



Innovation Fission

Event 1 leads to a *next series of products/services?*

Next series of events?

Which in turn lead to *new Applications*

Please discuss (at least one paragraph for each of the points);: (i) The Trigger event? (ii) How that event has played out ? (iii) How did the other events occur leading the influence of an innovation on society?