Indian Agriculture: Mechanization to Digitization

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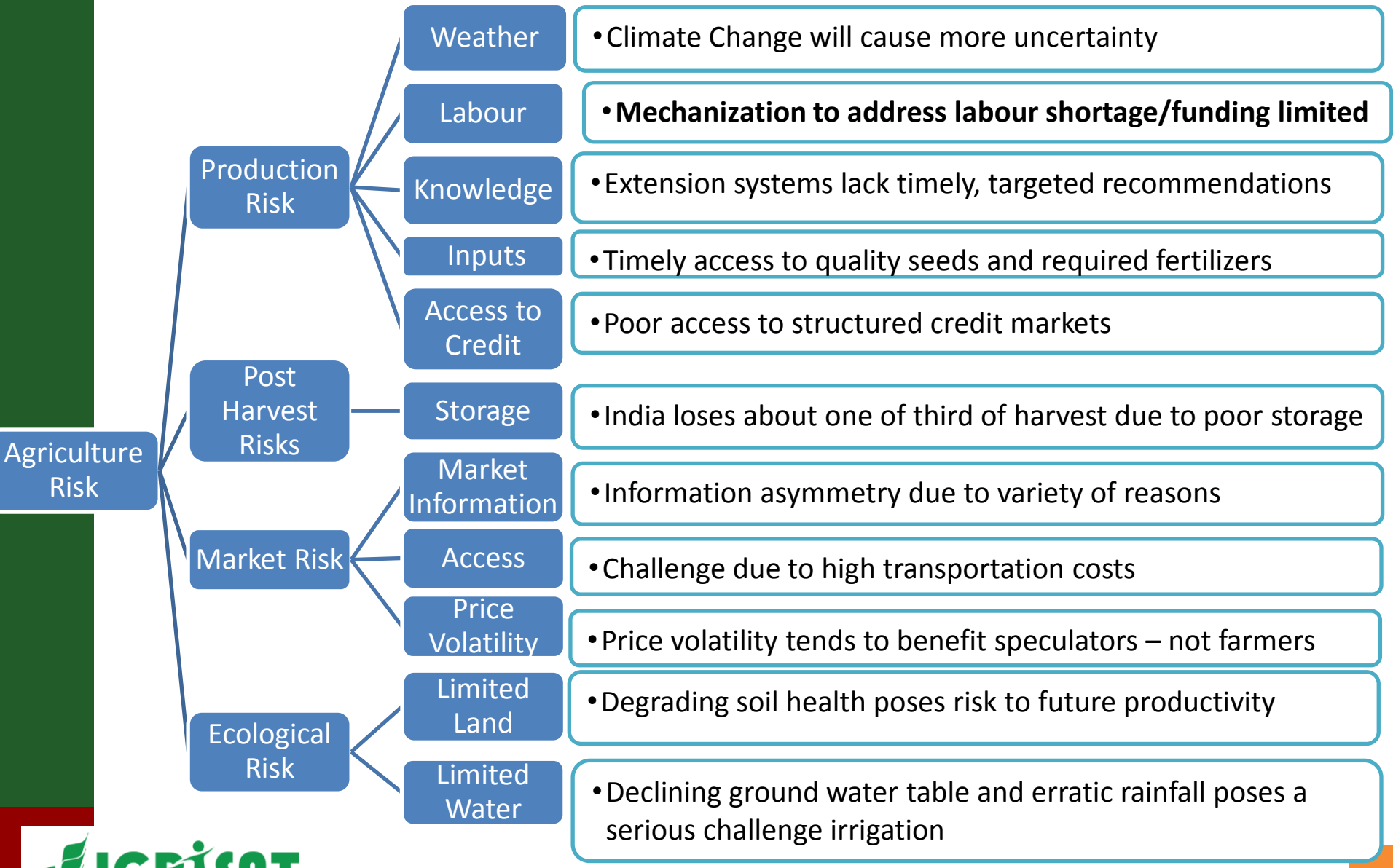
Indian Agriculture – a quick reality check

- India is characterized by small farm holdings.
  - More than 80% of the land holdings are less than 2 ha (5 acres)
  - About 55% of India's population is engaged in Agriculture with 40% farm mechanization
  - Due to non-remunerative nature of farming, more than 50% farmers in India are in debt.
  - This situation has constrained farmers from investing in mechanization and other technologies.
  - Most crops in India are rain fed with just 45% of land irrigated
- Without mechanization, farming is difficult work.
  - Most children of farmers opt out of farming.
  - The average age of farmers globally is sixty years.
- However the following events in the last few years made farming riskier
  - Volatility in commodity markets post the Global Financial Crisis (GFC)
  - Climate Change and global warming leading to erratic and unpredictable weather patterns
  - Redeployment of farm labour into other areas of the economy
- Apart from just mechanization, farmers must be tooled with a suite of tools and knowledge to better manage these risks.

Indian Agriculture is a High Risk Activity



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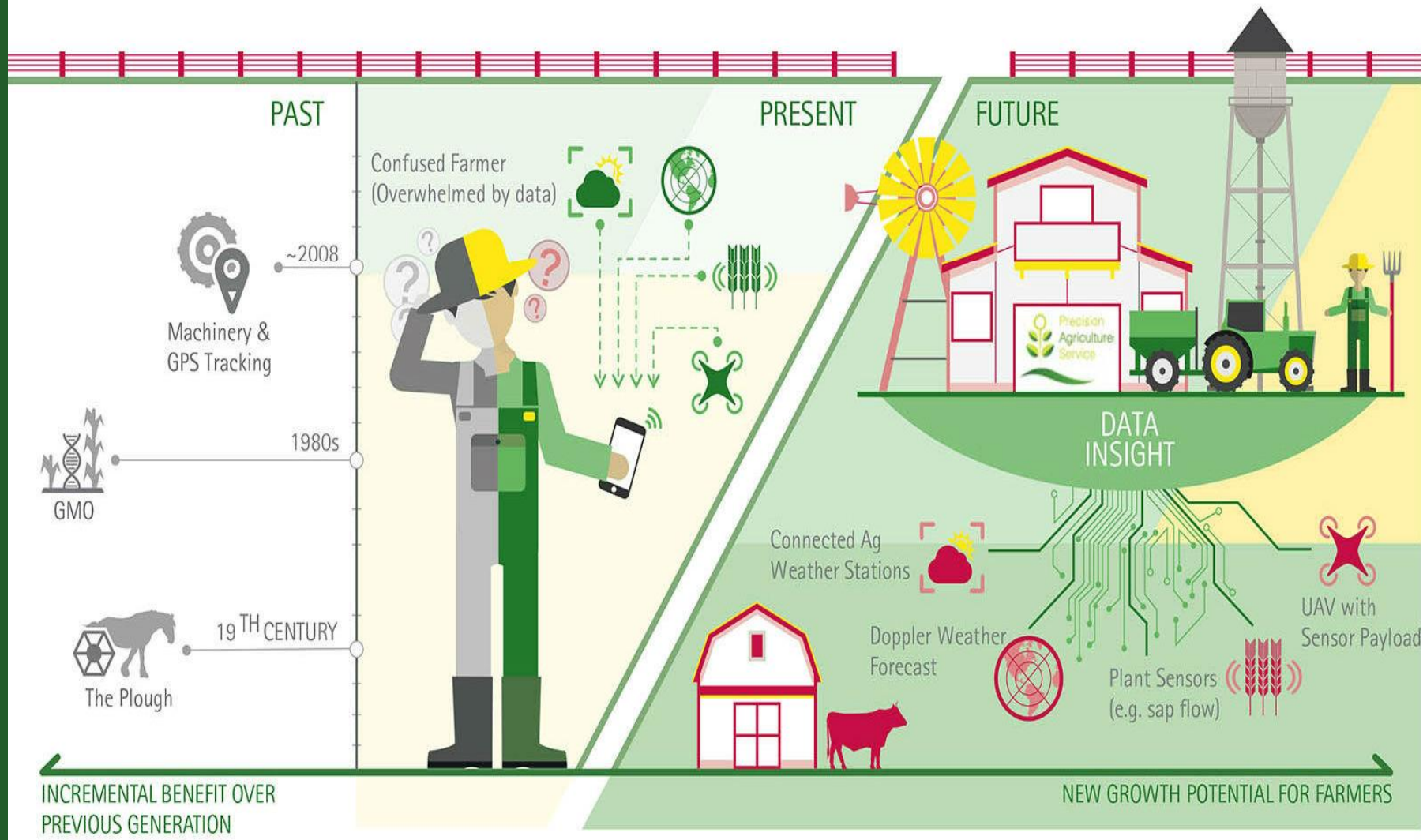
Digital technologies to manage risk and create opportunity

- Mechanization can address just one of the many risks that have been listed.
- To mitigate most of the risks faced by agriculture today, technology adoption is an imperative.
- Technologies that are important for modern agriculture are:
  - Remote Sensing
  - Drones/Unmanned Aerial Vehicles
  - Big Data and Analytics
  - Mobile Soil Testing Laboratories
  - Soil Health Cards
  - Digital Soil Maps
  - Mobile Money/digital wallets
  - National Identity Databases (Aadhaar)
  - Mobile Phones
  - E-Commerce
  - Sensors Networks (plants, soils, irrigation, etc)

- Digital Technologies have the potential to create equitable opportunities for Small Holder Farmers along the Agriculture Value Chain
- Digitization along the agricultural value chain maximizes benefits to the two ends of the value chain - Farmers and the Consumers



Ref: Accenture Precision Agriculture Services

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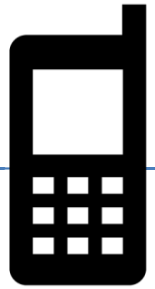
Potential "digital rails" to support end-to-end services for farmers

- Smallholder farmer
- Agro-entrepreneur
- Large-scale buyer
- Individual consumer
- Government



- **Farmer database**
  - *Holds information on each farmer – land boundaries, soil type, varieties grown, etc.*
  - *Updates in real time so buyers can track and forecast supply*
- **Data ecosystem**
  - *Aggregates geospatial and temporal datasets for sustainable intensification (e.g. digital soil maps, weather, variety adaptation zones, crop systems)*
  - *Stores data in the cloud*
- **eCommerce platform**
  - *Allows consumers to buy directly from farmers through mobile and web interfaces*
  - *Includes supply chain management to ensure quality and traceability*
- **Mobile banking**
  - *Gives farmers access to payments, savings, and direct deposit services*

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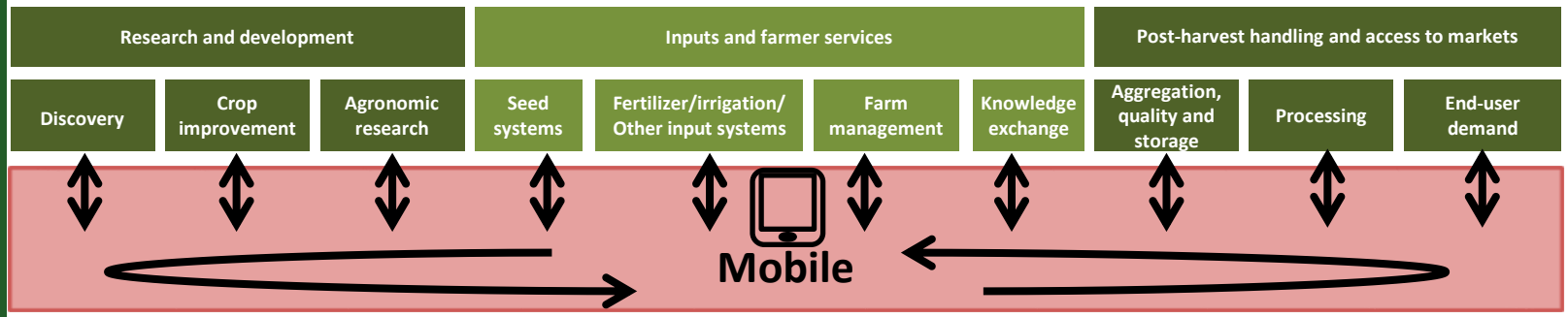
Digital agriculture to support equitable value chains



Financial Services

E-Commerce

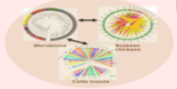
MOOCs & Advisory

Co-ordination/ Collaboration

Ecosystem of Integrated services offered through public- and private-sector providers, civil society and farmers organizations

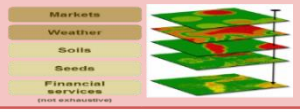
Demand-driven innovation supported by rapid feedback loops

R&D for accelerated genetic gains and improved nutrition



Bio-informatics/Systems Biology

Leverage location and time to drive market insight



Cloud-enabled Geospatial/Temporal Data Infrastructure

Global Unique Identifier Database (e.g. Aadhaar, Service Providers)

Enabling policy environment (e.g. Big Data Governance to protect Personal Information)

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Thank you!

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