



FOODSYSTEMS
2030

What's Cooking: Digital Transformation of the Agrifood System

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New World Bank Report

pathways
of
change

Investigates how digital technologies can accelerate the transformation of the agrifood system by improving its efficiency, equity and environmental sustainability.

policy
response

Identifies the relevant public policies and instruments to facilitate the diffusion, maximize the positive impacts, and mitigate the downside risks of digital technologies in agriculture.

assessment
tool

Offers an assessment tool that allows for a more systematic analysis of a country's constraints and capabilities in leveraging digital technologies in agriculture



<http://hdl.handle.net/10986/35216>



From Pathways of Change...

The food system is large and complex

UPSTREAM



\$939.5 billion

USD in value

102,500

Enterprises in Agricultural
Inputs and support

Millions

of Retailers

FARMERS



570 million
FARMS WORLDWIDE

DOWNSTREAM



\$3.7 trillion

USD in value

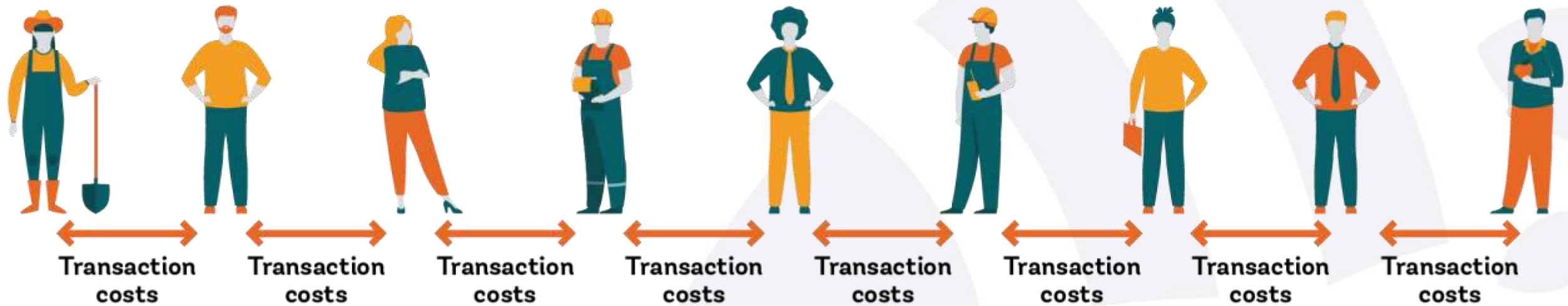
368,500

Enterprises in food
processing and logistics

Millions

of Retailers

Dozens of stakeholders and transactions are needed to bring food from farmers to consumers and transaction costs are incurred each time



High transaction costs and information asymmetries plague the agriculture and food system



Generate market failures: prevent otherwise profitable transactions from happening



Make it difficult to identify and adopt:

- Targeted agricultural policies
- Sustainable agricultural practices



Make it difficult for consumers to :

- Identify and adopt healthy diets
- Act on their preferences (quality, social concerns)

Data and digital technologies are transforming the agrifood system

Ability to collect, use, and analyze massive amounts of machine-readable data about practically every aspect of the value chain



Feedback loop to inform all aspects of the value chain

The emergence of digital platforms disrupting business models in the agrifood system.





In 2014,

190,000

data points
produced per
farm daily.



by 2050,

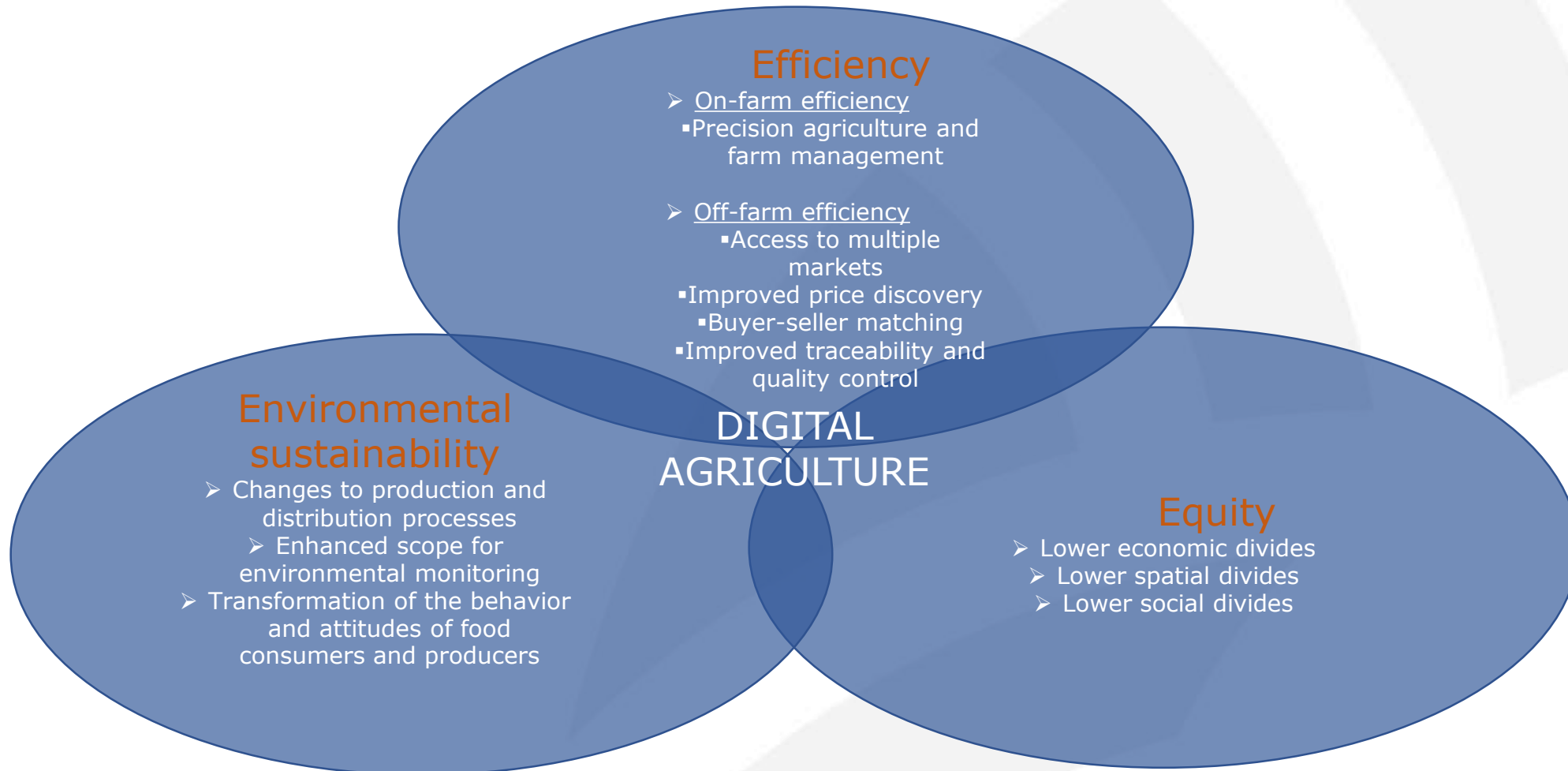
Experts predict

4.1

million

data points
daily.

Digital transformation results in economic and societal gains categorized by the three E's



Digital technologies solve old issues but create new risks



Opportunities

Increase market efficiency and competition in the value chain

Narrowing of economic spatial, and social divides in rural areas

Better use of scarce resources

Efficiency

Equity

Environmental Sustainability



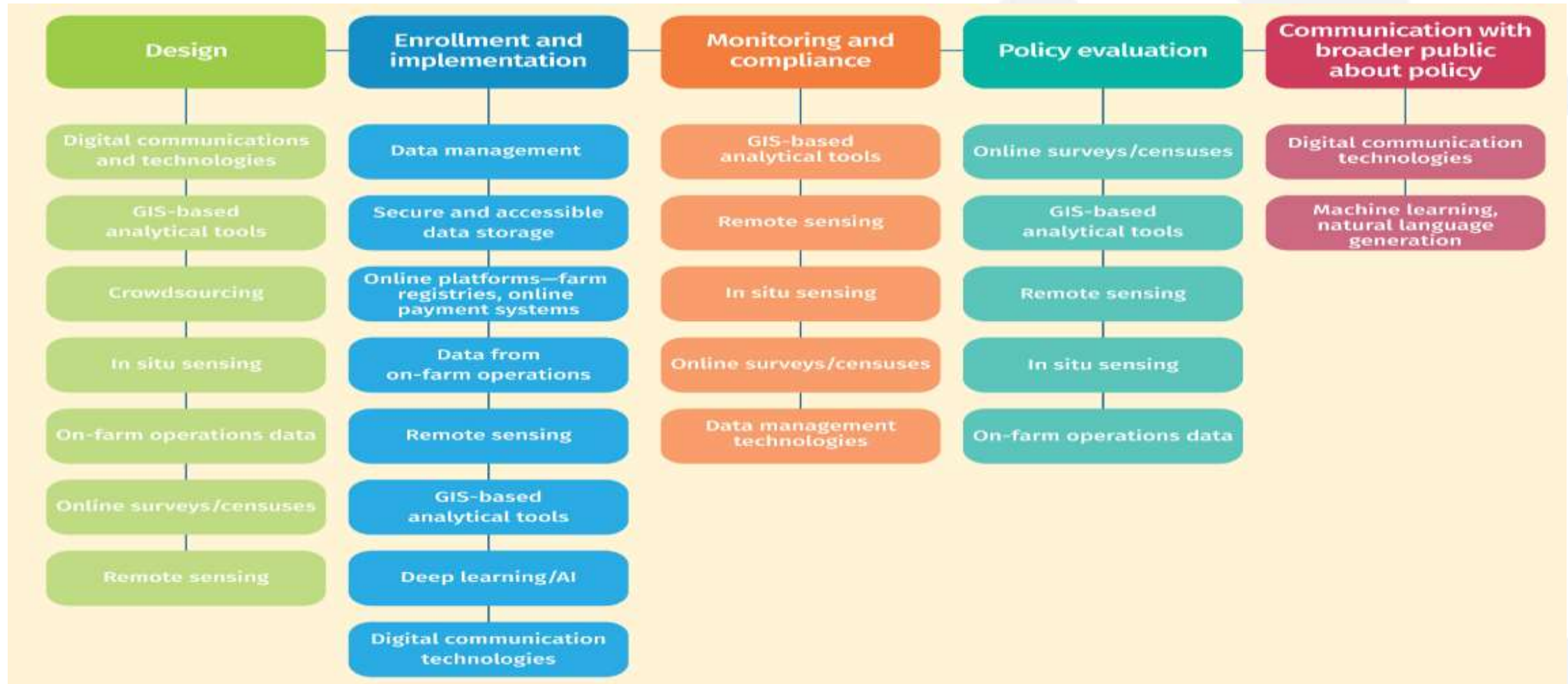
Risks

Increased market power to a few digital technology providers.

New digital divide and new social risks with of misuse of data


Rebound effect

Digital Technologies for Agricultural Policies





**...to Policy
Response**



Public policies are
needed to
maximize the
potential on
Efficiency, Equity
and
Environmental

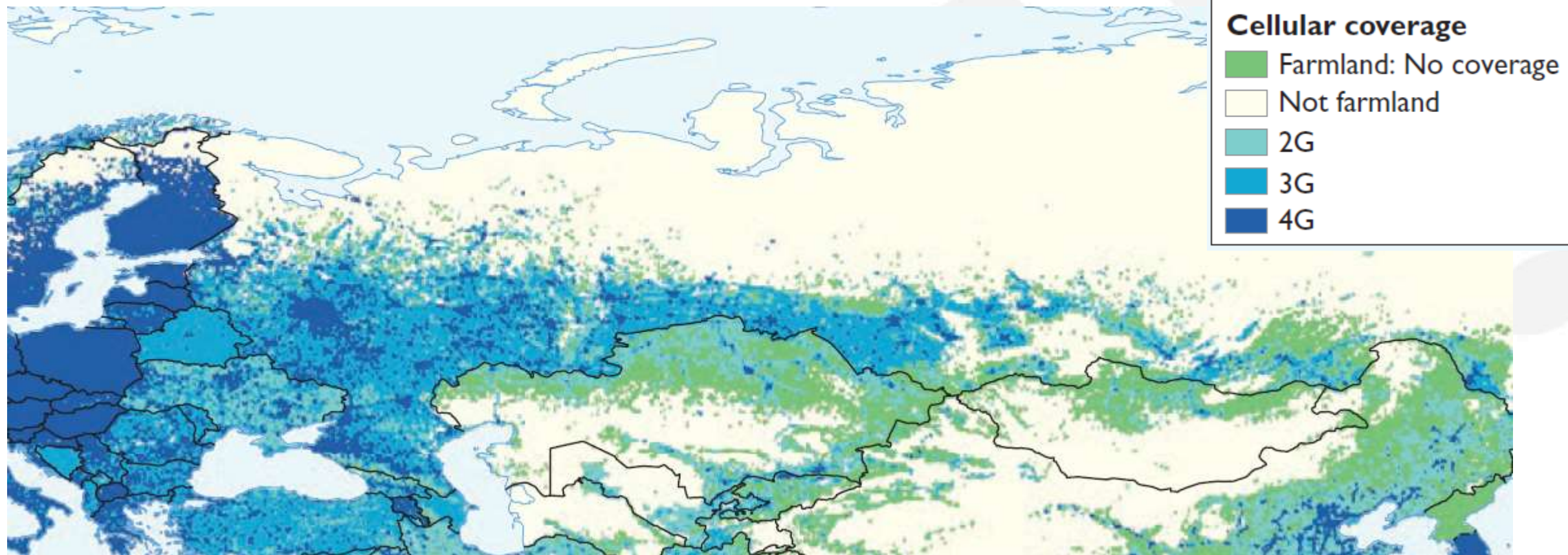
Three foundational enablers – Tier I enablers

**Government's
digital
innovation
capacity**

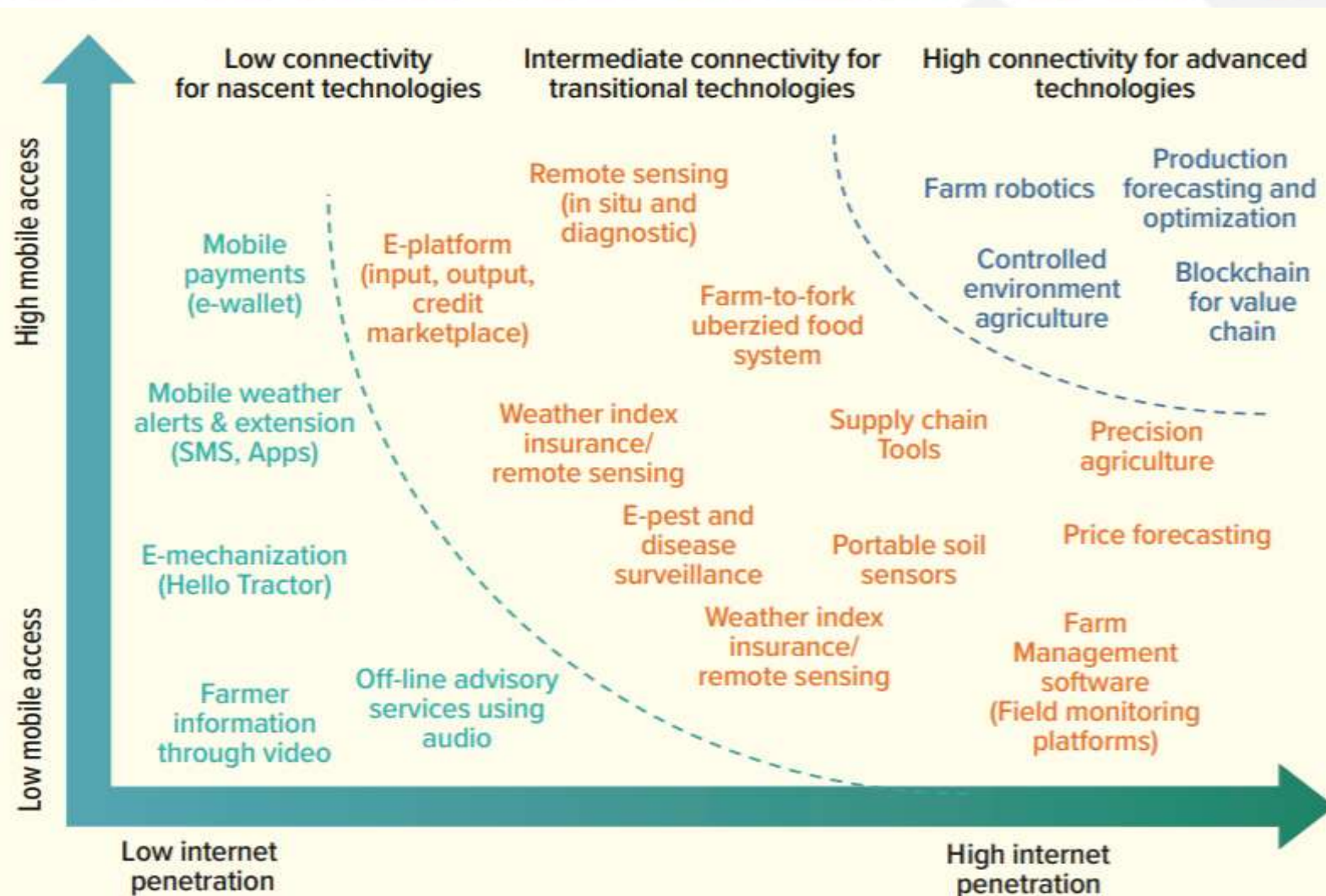
Digital infrastructure

Non-digital enablers

Mobile coverage in agricultural areas in ECA




Categories of digital agriculture technologies by mobile access and internet penetration



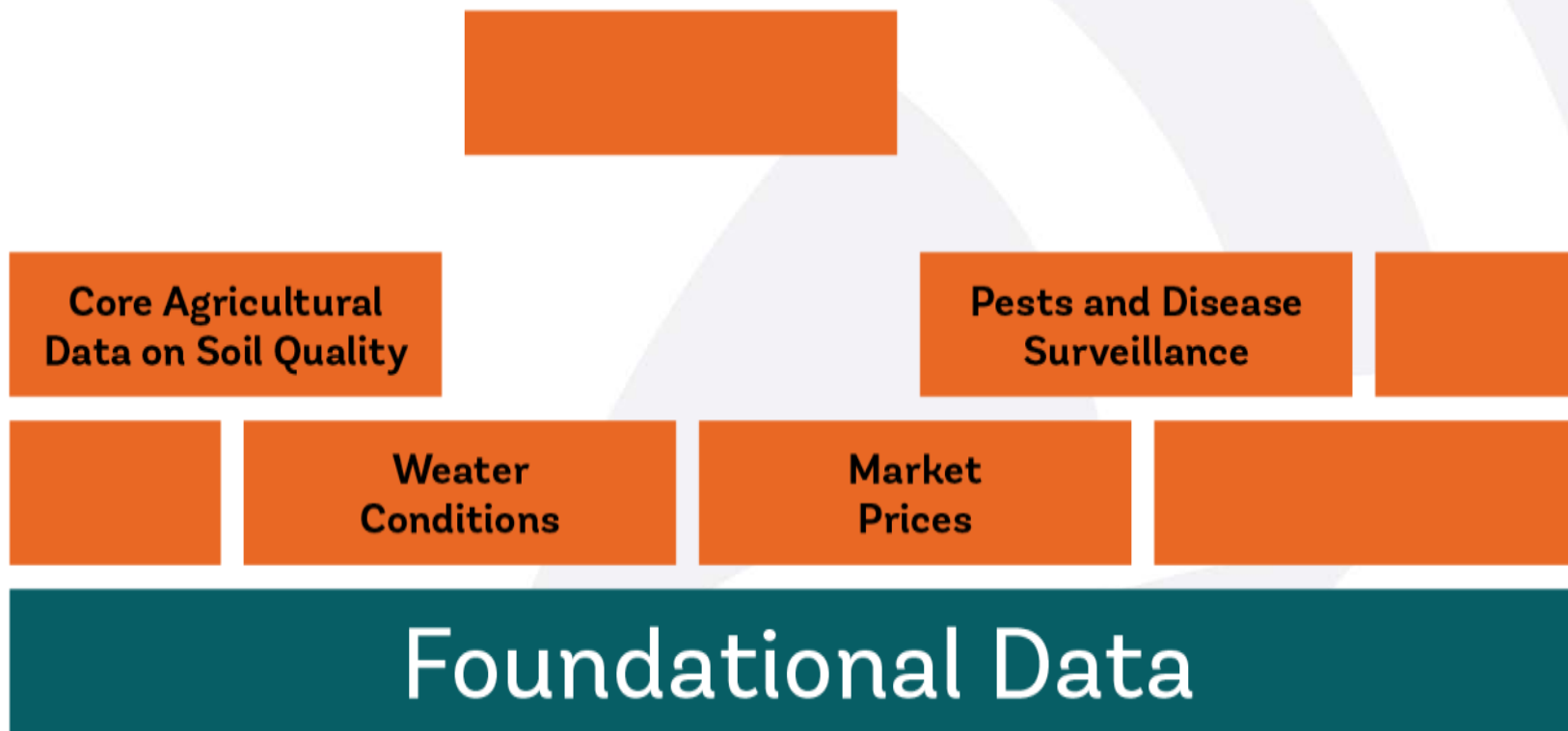
Agriculture Digitalization Index

Country	Agriculture Digitalization Index	Availability				Affordability					Enabling environment				
		2G coverage (%)	3G coverage (%)	4G coverage (%)	Digital Agriculture Availability Subindex	Mobile tariffs	Handset price	Mobile-specific tax	Inequality	Digital Affordability Subindex	Market Access Index	Access To electricity	Basic skills	Online Services Index	Nondigital Enabling Environment Subindex
Afghanistan	38.3	49.9	12.2	0.0	14.9	32.7	3.5	67.9	85.5	41.5	68.0	98.7	26.7	41.2	58.7
Albania	74.4	99.8	99.6	35.1	73.8	53.0	45.4	75.0	79.5	60.4	99.0	100.0	72.6	84.1	88.9
Algeria	57.2	100.0	53.6	2.9	42.6	50.3	32.9	74.3	84.0	56.6	99.5	100.0	62.5	27.7	72.4
Angola	32.5	30.2	2.7	0.4	7.3	45.1	31.6	82.9	40.3	47.6	40.8	43.3	37.6	48.8	42.6
Argentina	55.1	68.5	24.3	7.3	26.3	57.0	54.3	19.5	48.0	46.9	96.9	100.0	86.5	84.7	92.0
Armenia	76.4	98.4	92.0	81.2	89.0	52.2	49.4	54.3	69.0	55.1	97.8	100.0	73.0	70.0	85.2
Australia	86.6	51.4	96.9	88.8	84.6	82.5	100.0	87.5	69.3	86.1	65.0	100.0	97.2	94.7	89.2
Austria	90.5	100.0	96.2	96.1	96.9	90.2	75.0	75.0	72.8	79.1	99.9	100.0	86.9	94.7	95.4
Azerbaijan	65.7	91.6	76.7	0.7	49.3	61.3	52.8	68.2	90.3	65.9	94.7	100.0	62.3	70.6	81.9
Bahamas, The	50.3	46.3	24.1	21.7	27.6	63.7	71.2	50.3	51.3	60.8	14.5	100.0	67.9	67.7	62.5
Bahrain	85.2	100.0	100.0	100.0	100.0	57.1	73.3	93.1	52.8	68.3	99.7	100.0	70.1	78.8	87.2
Bangladesh	53.2	99.4	52.7	0.1	41.0	66.1	39.4	0	73.3	46.3	99.7	85.2	43.4	61.2	72.4
Barbados	73.7	100.0	100.0	86.2	94.5	40.8	56.0	49.1	28.5	44.5	98.9	100.0	71.3	57.7	82.0
Belarus	70.1	100.0	99.9	3.4	61.3	59.9	49.1	50.5	85.5	59.9	99.7	100.0	85.8	70.6	89.0
Belgium	90.5	100.0	100.0	99.9	100.0	70.4	100.0	73.8	84.0	82.7	99.9	100.0	90.1	65.9	89.0
Belize	50.9	92.6	80.0	7.4	53.5	27.2	44.6	53.2	17.8	35.7	69.0	99.5	58.7	26.5	63.4

A group of diverse children are smiling and looking towards the camera. The image is overlaid with a semi-transparent teal color. The text is positioned on the right side of the image.

“No regrets”
policy actions are
key to
maximizing the
benefits of
quickly
transforming the
food system

Strengthen access to foundational data and promote data sharing





Data Privacy

Data Ownership

Data Security

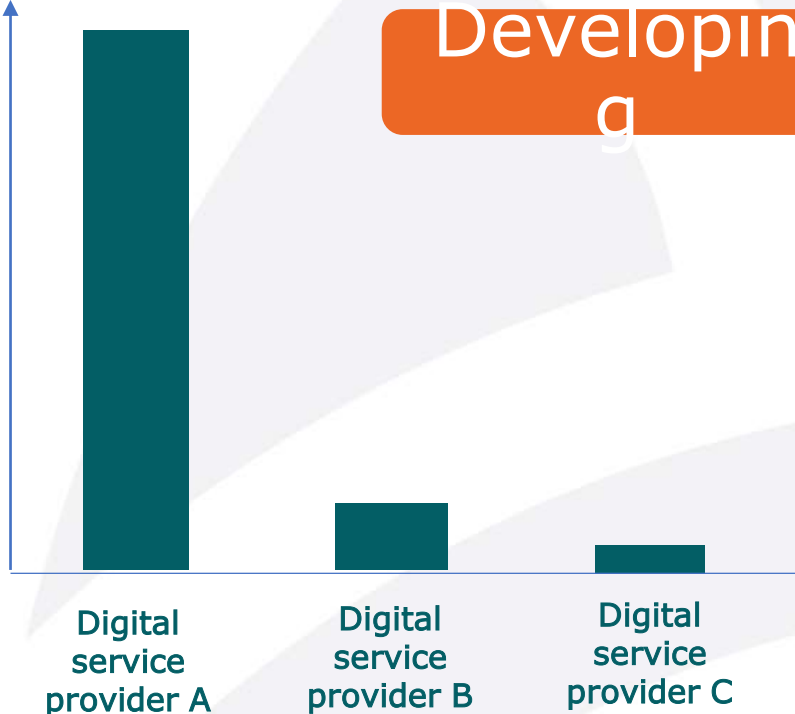
Review regulations that may constrain the adoption of technologies that enable precision agriculture.



Enable competition in digital markets



Market power



Enabling

- Consumer choice (avoiding lock-in)
- Consumer data protection

Monitoring

- Switching costs
- Market Structure

Developing

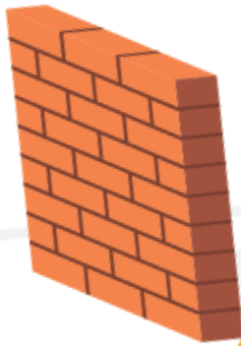
- Personal data markets or data trusts
- Digital data commons



Supporting development of digital payment systems.



Support digital entrepreneurship ecosystems



Regulations
Use Cases
Finance
Data

Scaling

Government action

E-agriculture policies

AgTech start-up policies

Regulatory sandboxes

Invest in transformational research and development.

Institutional innovation for cooperation between government, publicly funded research and private sector for better commercial applicability

Businessperso
n



Policymak
er

Researche
r

Policies to maximize equity and environmental sustainability gains of digital transformation

Equity

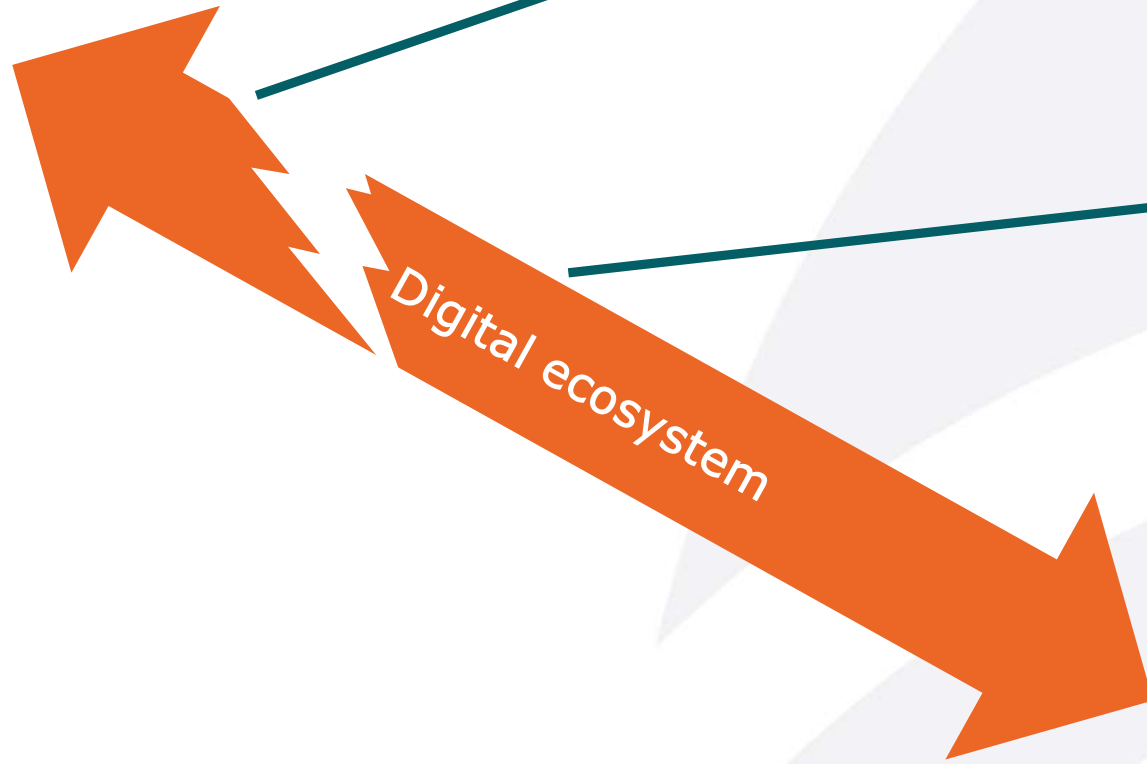
- Improving access to and use of digital technologies by marginalized groups
- Addressing data access asymmetries
- Adopting compensatory measures for potential losers of digital transformation in agrifood system

Environmental sustainability

- Strengthening digital environmental monitoring
- Incentivizing use of digital technologies for environmental sustainability by producers
- Incorporating environmental sustainability goals in agricultural policies
- Influencing behavior of consumers and producers through e-education and information dissemination

To identify effective policies and to prioritize interventions, governments need clear objectives and analysis of gaps in the system

Comprehensive approach





Digital Agriculture Profile

Vietnam

Digital Agriculture Profiling tool is designed to evaluate the state of agricultural and digital development in a country to identify policies and technologies that promise the highest impact solutions to the existing problems.

Join us for launch on July 1

THE WORLD BANK
IBRD · ICA

Food and Agriculture Organization of the United Nations

CIAT
International Center for Tropical Agriculture

IFAD
International Fund for Agricultural Development

Digital Agriculture Profile

• Viet Nam

HIGHLIGHTS

Agriculture plays a vital role in Viet Nam's economy, accounting for an average of 17% of the national GDP and employing 40% of the national workforce

The biggest challenges to agriculture are information and communication gaps that lead to inefficiency between the hubs of the agriculture value chain, including an absence of actionable decision-support systems for farmers, resulting in resource mismanagement and unnecessary expenditure

The most promising technologies for addressing these issues include smartphones (that can send and receive information), QR codes, blockchain (that connect information and data across the value chain), cloud-based solutions (that enable storage and access of data and information across varied sources), Internet of things, unmanned aerial vehicles (that facilitate gathering of data and insights at high resolution), and data analytics (that enables conversion of data to information and knowledge products)

Digital infrastructure is well established in Viet Nam; the primary constraint to digital agricultural solutions is digital literacy—i.e., stakeholders' inability to use digital technologies to acquire information, communicate, and solve challenges in the value chain

The public sector, nonprofit organizations, private industry, and international community all have important and distinct roles to play in creating sustainable digital agricultural solutions in Viet Nam

OVER 99% OF VIETNAMESE ACROSS BOTH RURAL AND URBAN AREAS HAVE ACCESS TO ELECTRICITY

VIET NAM IS RANKED **3RD** IN THE WORLD IN TERMS OF AFFORDABILITY OF INFORMATION AND COMMUNICATION; THE AVERAGE RATE FOR BROADBAND IS LESS THAN **USD 3** PER MONTH

90% OF FARMERS OWN A MOBILE PHONE, AND PER CAPITA MOBILE SUBSCRIPTION RATES ARE WELL OVER **100%**

42% MOBILE PHONE USERS HAVE 3G OR 4G CONNECTIONS, A **36%** INCREASE SINCE 2015

46% OF THE TOTAL VIETNAMESE POPULATION AND **10%** OF FARMERS USE BROADBAND INTERNET

What's Cooking Learning Series



The screenshot shows the top navigation bar of the World Bank Open Learning Campus. On the left, the World Bank Group logo is displayed with the text "BROUGHT TO YOU BY WORLD BANK GROUP". In the center, the "Open Learning Campus" logo is prominent, with the tagline "ACCELERATING SOLUTIONS THROUGH LEARNING" below it. To the right of the logo is the text "IN PARTNERSHIP WITH REPUBLIC OF KOREA MINISTRY OF ECONOMY AND FINANCE". On the far right, there is a "Help" link and a user profile for "Kateryna Goychuk". Below the navigation bar is a search bar with the text "Search" and a magnifying glass icon. A horizontal menu contains several items: "OLC Home", "My OLC", "Staff Learning", "WBx Talks" (which is highlighted), "WBa Academy", "WBc Connect", "Calendar", "About OLC", "Partners", and "Select a Topic".

Series
34 Part Series

What's Cooking - Digital Agriculture Learning Series

★★★★★ (13) | 8 Discussions

"How can the public and private sector make better use of digital agriculture tools to combat hunger and poverty and enhance food security all over the world?"

The BBL/webinar series What's Cooking on Digital Agriculture covers a wide range of topics and looks at the topic from all angles: technical, economic, implementation, political, etc. This platform serves to discuss the role of the public and private sector on how to make better use of digital agriculture tools to combat hunger and poverty and enhance food security all over the world. The public policy entry points to be considered are efficiency, equity, and environmental sustainability (EEE). As COVID-19 seems to have accelerated the digital transformation of the agriculture and food sector, it is of utmost importance to make sure all three entry points are taken care of in a balanced way so everybody – especially farmers on the ground in developing countries – benefit from this accelerated transformation.

<https://olc.worldbank.org/content/what%E2%80%99s-cooking-digital-agriculture-learning-series>



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Thank you!