Challenges and Solutions for Innovative Agricultural Technologies in North and Central Asia

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Challenges in Advancing Sustainable Agricultural Innovations

Strategies for Transforming Toward Sustainable Agriculture
Low Investment in Agricultural R&D

- In 2016/17, no Asia-Pacific country invested 1% or more of their agricultural output in research (Beintema 2020)
- Central/West Asia and North Africa face a significant 53% research investment gap
- In the Asia-Pacific (APC) region, the gap is 26%, relatively low
  - But the low gap is led by China and India’s investments (ASTI, 2020)
  - So, North and Central Asia exhibit high Agricultural research investment gaps

Source: IFPRI, ASTI, 2013; IFPRI, ASTI, 2020
Weak Enabling Capacity

**Insufficient Support to Agriculture**
- In North and Central Asia, the AOI tends to be relatively low
  - Typically below 1

**Weak Infrastructure**
- For instance, the beneficial irrigation efficiency in many North and Central Asia is below 30%

**Predominantly Small Farmers in Central Asia**
- Smallholders often lack access to processing, transport, and retail facilities for their produce, resulting in postharvest losses and missed income opportunities

**Graphic Elements**
- Agriculture orientation index, 2021–2022 average
- Global patterns of beneficial irrigation efficiency (Eb, ratio of transpired and diverted water)
- Smallholder Farms in the Developing World

**Sources**
- FAO, 2023
- Jonas Jägermeyr et al., 2015
- CAREC, IFPRI, ADB, Agriculture Development in the Central Asia Regional Economic Cooperation Program Member Countries: Review of Trends, Challenges, and Opportunities, 2019
Challenges in Advancing Sustainable Agricultural Innovations

Strategies for Transforming Toward Sustainable Agriculture
Reforming Institutions

- The agricultural land reform policy, along with accompanying investments and policies, can significantly impact the country's land tenure, crop structure, and agricultural productivity.

First, the land market should be further developed and land should be allowed to transfer among farmers with secured land rights.

Second, agricultural input and output marketization should be further enhanced.

Third, public service institutions in agriculture must be strengthened to support smallholder farmers.

Case of China’s land tenure reform
- From 1952 to 1977, China followed the Soviet Union in adopting a collective form of land organization.
- Since 1978: China has adopted a series of reforms, which gradually transformed the agricultural land system into a market-oriented one.

Sources: L. Ni, K. Akramov and S. Fan, 2024

The growth rate of China’s agricultural GDP
Repurposing Subsidies

- Reforming subsidies in the region can not only enhance nutritional outcomes but also promote green, low-carbon development.

**Case of China**

- If, half of the cereal subsidy is used to subsidize the production of foods with high nutritional value and low-carbon emissions, then compared with the 2030 baseline:
  - Food security and farmers’ agricultural incomes would be only modestly affected
  - Dietary quality would be improved
  - Agrifood system emissions would be reduced by about 0.3%

**Sources:** AGFEP, 2022
Reprioritizing R&D Investments

Reprioritize R&D investments to achieve multiple wins in North and Central Asia, especially facing climate change

➢ Repositioning R&D investments for sustainability could achieve a substantial return

  • There is a $4.5 trillion annual global opportunity associated with the transition to more sustainable, resilient food and land use systems (FOLU)

  • Eg, in Mongolia, in 2030

    ✓ Investments in agricultural R&D, water management, and market access infrastructure reduce hunger by only 10%-20% in a scenario without climate change

    ✓ However, under climate change conditions, the impact surges to over 40%

Source: FOLU website, accessed 2023
AGFEP, 2022

Source: IFPRI, 2022, Research for the future: Investments for efficiency, sustainability, and equity
Leveraging Private Sector

Incentivizing private-sector agriculture investment in North and Central Asia is crucial.

Some strategies to promote private-sector investment:

- Create investment opportunities
  - Corporates raise the bar for sustainability on existing business-as-usual investments and continue mainstreaming ESG commitments
- Expand Green Financing Aligned with Climate Impact
- Accurately assess risk and deploy appropriate risk-mitigating mechanisms
- Intermediate/match to the respective risk-return profiles of different sources of private capital

Prospects of the contribution from the private sector:

- Promote innovative research and drive the adoption of innovations
- Creates employment opportunities
- Investments in infrastructure, processing facilities, and value chains boost economic activity and livelihoods
- Fosters market linkages, trade, and export opportunities

Source: CGIAR, Financing the Transformation of Food Systems Under a Changing Climate, 2023
Promoting Bundling Innovations

➢ A single technology requires a tradeoff between multiple goals, and a single innovation serves only one incomplete purpose

➢ Successful innovations require the enabling environment essential to development and diffusion

➢ It is necessary to combine the social and scientific to unlock the transformative potential of emergent technologies

✓ Technology
✓ Knowledge
✓ Institution
✓ Culture
✓ Policy

Source: Barrett et al. (2020)
Bringing Together Global Innovation — WAFI and the Pinggu Consensus

✓ The 2023 World Agrifood Innovation Conference (WAFI) took place from November 2nd to 4th in Pinggu District, Beijing
✓ The event drew 800 delegates, comprising scientists, educators, entrepreneurs, government officials, and young talents from 61 countries and regions around the globe
✓ Participants actively participated in thorough discussions and workshops focused on the theme of 'Food Security and the Future of Agriculture,' ultimately culminating in the formulation of the Pinggu Consensus

I. Global food and nutrition security is the foundation for future human survival and development
II. Innovations in science, technologies, policies, institutions and business models are the fundamental driving force for the transformation of agrifood systems.
III. Cutting-edge, multi-disciplinary, and cross-sectoral global cooperation on agricultural science and technologies is crucial to transforming agrifood systems.
IV. Universities are for scientific research and talent development to transform agrifood systems.
V. Engagement of entrepreneurs and the private sector is essential for agrifood systems transformation as they are major drivers of innovations.
VI. The young generation shoulders the responsibility and mission of ensuring future global food and nutrition security.

✓ Conference participants finally suggest that WAFI should be held regularly to ensure momentum, contributing to agrifood systems transformation at the local, regional, and global levels
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