Leveraging mechanization-based innovation and technologies for sustainable and climate-smart agriculture in North and Central Asia

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Climate Change Impacts

**Economic Impacts**
- Water scarcity:
  - Crop yields
  - Irrigation costs
  - Farm incomes
- Soil degradation:
  - Soil fertility
  - Production cost
  - Profitability
- Extreme weather events:
  - Crop damage
  - Damage Infrastructure
  - Production losses

**Social Impacts**
- Conflicts over water
- Migration from rural areas
- Land abandonment
- Loss of livelihoods
- Disruption of livelihoods and communities
- Risks and hardships of vulnerable population
Examples of Mechanization-based Technologies and Practices

- No tillage and subsoiling stubble traw mulching
- Permanent Soil Organic Cover: Solar Power Drip Irrigation
- Diversification of Species: Biodegradable and permeable plastic film mulching
- High-efficiency water-saving irrigation technologies
- Drones for fertilizer/pesticide/herbicide spaying
- Low pressure irrigation technologies
Role of Innovative Mechanization-based Technologies and Practices

Solar power sprinkles

UAV multispectral remote sensing

Drone used for spraying operations

Increased productivity

Reduced environmental impact

Enhanced crop quality

Empowerment of small farmers

Sustainable agricultural mechanization, tailored to the unique environmental and socio-economic contexts of North and Central Asia, can play a pivotal role in food system transformation.
Integration of Digital Devices and Artificial Intelligence (AI)

- Digital devices such as smartphones, tablets, and IoT sensors play a pivotal role in modern agriculture.
- They enable farmers to access real-time data, make informed decisions, and optimize resource use.
- AI could help agriculture by enabling predictive analytics, automation, and providing some recommendations.
- AI-powered tools could help to analyze data to provide valuable insights for farmers.
Solutions and Pathways Ahead

Leveraging mechanization-based innovation and technologies for sustainable and climate-smart agriculture

➢ Policies and investments must prioritize capacity building initiatives
➢ Accessibility to applicable and affordable technologies
➢ Development of infrastructure that supports sustainable farming practices
➢ Strengthened cooperation in climate adaptation strategies at international, regional and sub-regional levels

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CSAM’s Engagements and Collaborations

Online Workshop on Climate Smart Mechanization for Sustainable Food Systems Transformation in Central Asia
27 September 2021 16:00 - 18:00 (Beijing Time)

Thank you for your attention!