Digital Agriculture Profile

Turkey

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National Context
Agricultural production systems

- Three distinct climatic regions

<table>
<thead>
<tr>
<th>Region</th>
<th>Climate Description</th>
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<tbody>
<tr>
<td>Mediterranean</td>
<td>Hot and dry summers, mild and wet winters</td>
</tr>
<tr>
<td>Continental</td>
<td>Hot and dry summers, cold and harsh winters</td>
</tr>
<tr>
<td>Black Sea</td>
<td>Temperate and wet all year long</td>
</tr>
</tbody>
</table>

[Map of Turkey showing regions: Mediterranean, Black Sea, Aegean, Central Anatolia, Eastern Anatolia, Southeast Anatolia, Marmara, Mediterranean Region]
National Context

Agricultural production systems

• 50% is agricultural land

• The average farm size is 6 hectares

• Nearly 70% of farmers hold less than 5 hectares of land
National Context
People, livelihoods and agriculture

Turkey is home to 80.75 million people, 25% of whom live in rural areas.

Agriculture employs 20% of population.

33% of women were employed in agriculture.

80% of female farmers and less than 25% of male farmers conduct unpaid family farm labor.
Economic relevance of agriculture

- Agriculture accounts for 6.4% of Turkish GDP valued at US$761 billion (2019)
- Food-processing industry is well developed: over 47K enterprises
- Turkey is one of the largest agricultural exporters in the region
Challenges in the agricultural sector

- Low levels of productivity
- Central Anatolia relies heavily on groundwater resources
- Climate change impacts are expected to exacerbate these issues
- Inefficiencies in value-chains
- Powerful regional distributors that buy from producers and sell to national and international markets
- Policy-related constraints (OECD Agricultural policy M&E 2020)
Challenges in the agricultural sector
Turkey has successfully been improving access to digital technologies and services within the last decade.

Turkey ranked 5th for improvements made to 3G and 4G coverage, network performance, and spectrum availability. Most significant improvements were towards physical infrastructure including for cloud-based and big data services.
Digital infrastructure, availability and access

➢ Turkey has successfully been improving access to digital technologies and services within the last decade.

THE COUNTRY HAS OVER 450 ICT SERVICE OPERATORS (2017)

MOST SIGNIFICANT IMPROVEMENTS WERE TOWARDS PHYSICAL INFRASTRUCTURE INCLUDING FOR CLOUD-BASED AND BIG DATA SERVICES
Digital infrastructure, availability and access

➢ Turkey has successfully been improving access to digital technologies and services within the last decade.

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TWO SATELLITES LAUNCHED:
RASAT IN 2011
GÖKTÜRK-1 IN 2016
FOR EARTH OBSERVATION, POLLUTION AND NATURAL DISASTER MONITORING, AND LAW ENFORCEMENT
Digital infrastructure, availability and access

90% of the population has 4G network coverage.

97% of surveyed inhabitants had mobile cellular subscriptions.

71% of individuals actively use the internet.
Turkey has laid a strong foundation for digital agricultural solutions, and the digital agriculture ecosystem is growing rapidly.
Barriers to adoption of digital agriculture

- Digital literacy
- Trust
- Most producers do not invest in novel farming technology
- Limited access to data in order to inform the development of value-added services
- Computer science (for agriculture) workforce
- Gender power dynamics in the agricultural sector may also hinder the scale-up of innovations and technologies
Enabling Digital Agriculture
Identifying the most promising technologies across multiple end user barriers

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Technology</th>
<th>Strategy</th>
<th>Analytics</th>
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<tbody>
<tr>
<td>SMS / IVR decision support systems for low-tech farmers</td>
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<tr>
<td>Computer / smartphone applications for farmer decision support</td>
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<tr>
<td>Sensors and application for real-time livestock location / health info</td>
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<tr>
<td>Internet of Things or advanced analytics / decision support</td>
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<tr>
<td>Digital platform equipment shake</td>
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PRIORITY TECH SOLUTIONS

- INPUT
- PRODUCTION
- DISTRIBUTION
- CONSUMPTION
PRIORITY TECH SOLUTIONS

- Database Technologies and Advanced Analytics for performance-based subsidy schemes.
- Risk Assessment Models and Digitized Contracts for optimal financial systems.
- Sensors, Internet of Things, and Advanced Analytics for decision support.
- Digital Machinery-Sharing Platform for lower costs of mechanization.

ACROSS THE FOOD SYSTEM

- Input
  - Smartphone applications or SMS / IVR systems for real-time market information.
- Production
- Distribution
- Consumption
  - Blockchain for enhanced traceability systems.
Potential avenues

**Public sector**
- Strategy for implementation digital agriculture (FAO & MOAF) and further investments
- Opportunity to further leverage existing databases
- Empower start-ups through grants, investment funds, incubators, and accelerators
- Educational programming
- Digital inclusion: offering solutions for clients across the digital literacy spectrum

**Private sector**
- Economies of scale: farmer organizations
- Public-private partnerships: on developing strong business models, barriers to adoption, and quickly scaling innovative digital agriculture solutions
Turkey has a strong foundation for digital agricultural solutions

Digital innovations can address the core challenges of food production

Identified high-impact solutions

For small-scale and low-tech farms:
SMS / IVR and Application-based advisory systems to support decisionmaking and peer-to-peer knowledge sharing.

Medium and large scale farms with the means to invest:
Weather stations, soil and livestock sensors, and Internet of Things.