Fostering Digital Agriculture in Europe and Central Asia

-

Status of Digital Agriculture in TURKEY

REPUBLIC OF TURKEY
MINISTY OF AGRICULTURE AND FORESTRY

TAGEM
R&D AND INNOVATION

What Is The Status And Process Of Digital Transformation Of Agriculture In Our Country?

Agricultural GDP value is about $ 50 billion and **the share** of **agriculture** in **total GDP** is around 6.4%

In the last 10 years Turkey took place many digitization moves. **The year 2020** is defined the year of digital agriculture,

- The advances in information and communication technologies,
- The increasing area of use of artificial intelligence in agriculture, internet of things,
- GPS,
- The integration of image processing technologies into agriculture,
- Precision agriculture technologies and
- The advances in smart agricultural practices

enter into our lives with Industry 4.0 drive countries in developing policies in these areas and take action. Within this scope, a project idea was developed, aiming at preparation of National E-Agriculture

Strategy Preparation Process;

- How can we integrate Information and Communication technologies into agriculture as a country?
- Which technology is a priority for our country's agriculture?
- What information technology do we allocate our resources to maximize production?

Include all sector stakeholders in the process

- All relevant ministries,
- University,
- Chamber of Agriculture,
- Development agencies,
- Presidential Digitalization Office

What Is The Status And Process Of Digital Transformation Of Agriculture In Our Country?

Firstly we determined the basic parameters of digitalization in agriculture

- Internet usage status, accessibility and share of agricultural activities on the internet of producers operating in the agricultural sector,
- The rate of farmers using digital infrastructures in public transactions (e-government, agricultural information system)
- The rate of farmers using smart agriculture and precision agriculture (robotic applications, drone, sensor, GPS etc.) technologies,
- Integration rate of public services in agriculture with E-government,
- The prevalence of online and mobile learning platforms in education and publication,
- Digital tracking rate in terms of both value chain and food safety in all processes from soil to fork,
- Intensity of use of information and communication technologies in the process of data collection, processing and sharing,
- Prevalence of artificial intelligence based early warning systems

Secondly,

- To determined our priorities by taking into consideration the strategic targets for agriculture in our country.
- To identified the difficulties we experienced in achieving these goals

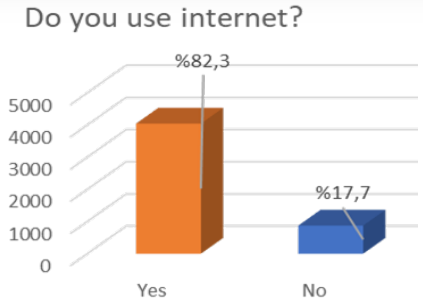
Finally, we identified possible ICT solutions with the support of FAO experts

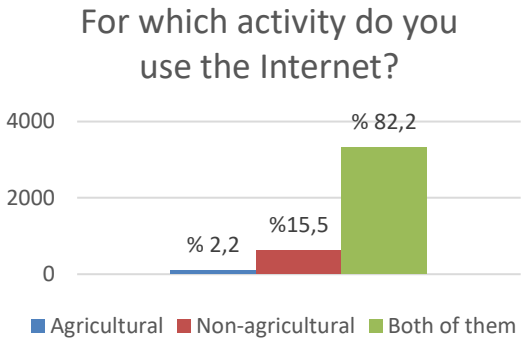
The project has two basic outputs.

- First is to put forth the short, medium- and long-term steps that Turkey has to take in e-Agriculture through workshops;
- The second is to identify the perceptions and the expectations of the farmers on e-agriculture.
- The questionnaire form under this heading is a study to identify **good practice** examples at the district level.

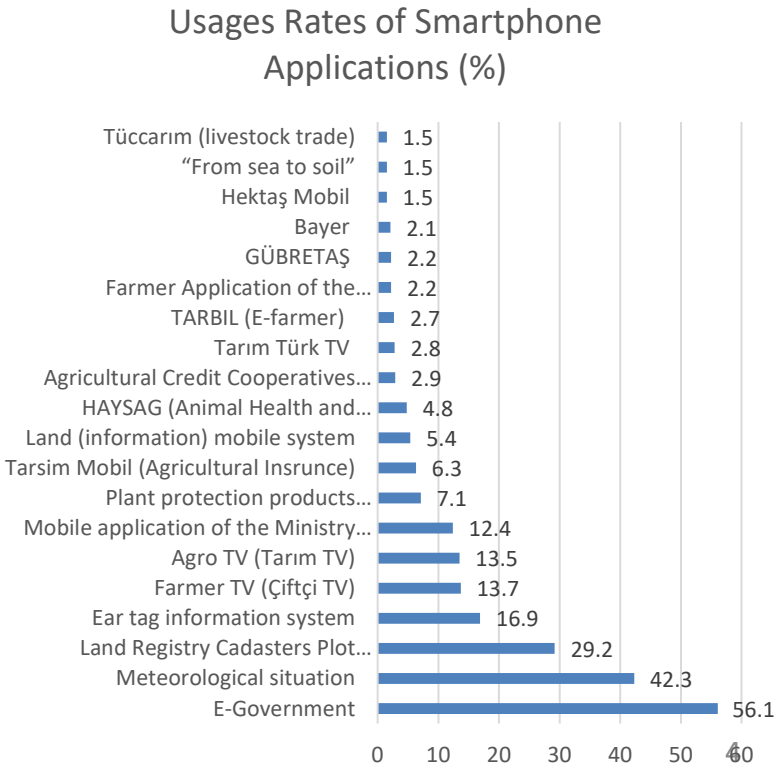
What are the good practices emerging from the process of digital transformation of agriculture?

In accordance with our project purpose we arranged survey in 81 cities with around 5000 farmers and now we analyze the results





Agricultural e-commerce		
	n	%
No	4552	93,1
Yes	339	6,9
Individually	266	78,5
Through farmer associations	38	11,2
Agricultural Product Sales	115	34
Input supply for agricultural production	82	24,3



GOOD PRACTICES

What current technolgy do you use in your production (%)

- Water temperature humidity, PH, salinity, conductivity measurement sensors
- Machines with sensor (soil sensor, humidity sensor etc.)
- Variable rate spraying
- Herd management software
- Variable rate fertilization
- Robotic applications
- Tractor with automatic steering
- Computer controlled smart irrigation system
- Automatic milking systems
- Combine harvester with efficiency meter kit
- Incubation tracking software
- Drone (Unmanned aerial vehicle)
- Smart Greenhouse Systems
- Automatic fish feeding system

GOOD PRACTICES

Farm Name	FARM OF THE ALIBABA
Location	ADANA
Short Biography	ESTABLISHED IN 2012. FARM IS ESTABLISHED ON 850 (DA). THERE ARE 2000 CATTLE AND 200 SHEEP GOATS IN THE OPERATION. DAILY PRODUCTION OF 20 TONS OF MILK. WITH A DISEASE-FREE CERTIFICATE
Digital technologies used?	Soil Sensor, Humidity Sensor Etc.)] Computer Controlled Smart İrrigation System Milking Systems Herd Management Software Water Quality Measurement Software Automatic Bottom Stripping Machine Automatic Fertilizer Separator Milk Cooling Tank Milk Cooling And Heating Tank Angry Measuring Ear Earing, Milk Herd Management Recognition Earing, Loose Counting Leash (Covers Of Cows Followed On Computer) Feed Mixing And Distribution Machine Pre-Milk And Post-Milk Disinfection Fast Exit parlor 20 * 2 Solar Energy Panels
Aim	convenience in animal tracking, Animal disease tracking, milk yield monitoring, need less workforce

GOOD PRACTICES

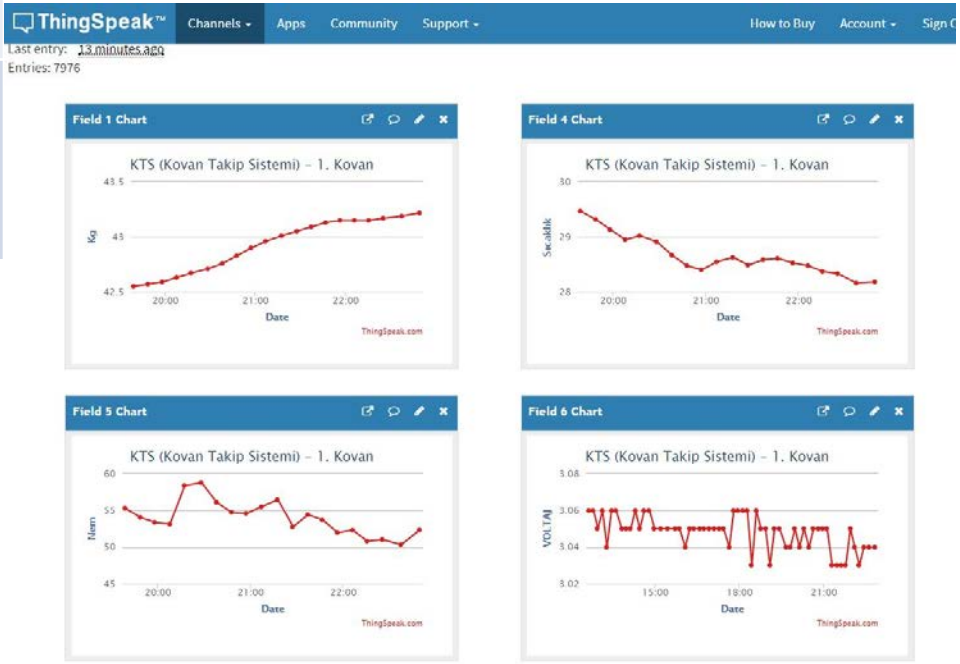
Farm Name	ÖzüAgro Kaysera
Location	Balıkesir
Short Biography	Production started in May 2018. It is a soilless agricultural greenhouse. Bunch tomatoes are produced. It has a production area of 50 decares. Geothermal energy is used.
Digital technologies used?	Robotic applications Isobus system Combine harvester with efficiency meter kit Tractor with automatic steering Machines with sensor (soil sensor, humidity sensor Computer controlled smart irrigation system Variable rate fertilization Variable rate spraying Smart Greenhouse Systems Water quality measurement software Water temperature humidity, PH, salinity, conductivity measurement sensors
Aim	Production in good agriculture.

GOOD PRACTICES

Farm Name	BİRLİK ZİRAAT İŞLETMESİ
Location	UŞAK
Short Biography	Using the most advanced agricultural technologies, fruit / vegetables are grown without hormones, quality, healthy and high yields. It is aimed to supply to the domestic and foreign markets.
Digital technologies used?	Machines with sensor (soil sensor, humidity sensor etc.) Computer controlled smart irrigation system Variable rate fertilization Variable rate spraying Smart Greenhouse Systems Water quality measurement software Water temperature humidity, PH, salinity, conductivity measurement sensors
Aim	Tracking Efficiency and Quality

GOOD PRACTICES

Farm Name	TOKAT HONEY BEE BREEDERS ASSOCIATION
Location	TOKAT
Short Biography	Tokat Honey Bee Breeders Association was established in 2002.
Digital technologies used?	HIVE TRACKING SYSTEM With the hive tracking system, you can follow the beginning and end of the nectar flow, the amount of nectar collected daily, so that a more efficient beekeeping can be done.
Aim	Union; It organizes projects and trainings so that its members are knowledgeable, self-renewing, carrying the work of research institutions to the field and constantly improving themselves



GOOD PRACTICES

In manual milking in highland and pasture, it was determined that 75-85% of milk remained in the breast and could not be brought into the economy. A mobile milking machine powered by solar energy stored for animals was designed and prototyped.

GOOD PRACTICES

How the arising challenges might be turned into the opportunities?

The most important challenges in agriculture are high agricultural costs and market instability, intermediaries earn more than producers.

- Ministry of Agriculture and Forestry launched the Digital Agriculture Market (DİTAP), which will carry the entire chain from food production to consumption.

- With the support of all stakeholders of the agriculture (Ministry of Treasury and Finance, Ministry of Commerce and The Union of Chambers and Commodity Exchanges of Turkey (TOBB)), Agricultural Markets Digital will meet in a single platform.

- DİTAP will enable agricultural supply and demand to meet with the "digital marketplace" approach and contract agriculture.
- This approach will enable the producer to earn more income,
- The agricultural product desired by the industry will be access
- The consumer to access agricultural products cheaper.

Agricultural sector stakeholders using DİTAP via www.ditap.gov.tr will also be able to benefit from the supportive loan packages of banks created within the scope of contract agriculture.

How the arising challenges might be turned into the opportunities?

EVERYTHING ABOUT AGRICULTURE IS IN "AGRICULTURAL FOREST ACADEMY"

FARMER, MANUFACTURER WILL REACH ITS 24/7 INFORMATION

The "Agriculture Forest Academy" portal, which is designed as a distance education, aims to provide farmers and producers with the information and training videos that will be published on the internet.
In the "Agriculture Forest Academy", which serves up-to-date, sustainable knowledge and accumulation, the farmer will be able to access the information he is looking for at any time.

How the arising challenges might be turned into the opportunities?

- Another problem is migration from rural areas to the city.
  - Digitalization Of Agriculture,
  - Increased Access To The Internet,
  - Information Communication Based Broadcasting Systems And

will play an important role in overcoming these problems.

- Policy determination will be able to eliminate the efficiency problems by obtaining proper data from the field and developing decision support systems by processing these data.

- In this respect, information communication-based data supply is an important opportunity area

- According to the results of our research, the criteria such as the use of internet, computer, smartphone, and the use of mobile phone applications are young farmers ahead in digital literacy.

- **Based on these findings, digitalization is seen as an important topic for the young population to remain in agriculture in our country**.

THANK YOU FOR YOUR ATTENTION

Hilal AR

hilal.ar@tarimorman.gov.tr

TAGEM