



Food and Agriculture  
Organization of the  
United Nations

# DIGITAL VILLAGES IN ACTION

Europe and Central Asia

VIRTUAL EVENT

18 MAY 2023

09.30-12.00 CEST





09.40 - 09.50

## Introducing DVI in Europe and Central Asia

- Ms **Daniela Di Gianantonio**, FAO Digital Agriculture Team Leader

## Session 1 – DVI in Central Asia and Azerbaijan

09.50 - 10.15

### Ministerial roundtable: Central Asia and Azerbaijan

- H.E. **Sarvan Jafarov**, Deputy Minister of Agriculture of the Republic of Azerbaijan
- H.E. **Nurdin Alisherov Kuvanychbekovich**, Deputy Minister of Agriculture of the Kyrgyz Republic
- Mr **Fayzimahmad Amonov**, Head of the Department on International Relations, Science and Implementation of Scientific Achievements of the Ministry of Agriculture of Tajikistan
- Mr **Aziz Khakimov**, Chief Specialist in Information Communication Technologies, Ministry of Agriculture

Moderated by Mr **Viorel Gutu**, FAO Sub-regional Coordinator for Central Asia

10.15 - 10.45

### Experiences from project countries

- Azerbaijan - Mr **Elmaddin Namazov**, Programme Coordinator, FAO Azerbaijan
- Kyrgyzstan - Dr **Kanat Sultanaliev**, Executive Director, Tian Shan Policy Center, American University of Central Asia
- Tajikistan - Ms **Veronika Sherova**, FAO Digital Agriculture Analyst
- Uzbekistan - Mr **Fenton Beed**, Senior Agricultural Officer, FAO Plant Production and Protection & Ms **Katerina Antanevich**, FAO Digital Agriculture Specialist and Sociologist (live from Novkent village)

10.45 - 10.55

### Q&A



## Session 2 – DVI in the Western Balkans, Georgia and Türkiye

<b>10.55 - 11.20</b>	<b>Ministerial roundtable: Western Balkans, Georgia and Türkiye</b> <ul style="list-style-type: none"><li>• H.E. <b>Frida Krifca</b>, Minister of Agriculture and Rural Development of Albania</li><li>• H.E. <b>Slobodan Cvijanović</b>, Assistant Minister at the Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina</li><li>• Mr <b>Metin Türker</b>, Director General of Agricultural Research and Policies of the Ministry of Agriculture and Forestry of Republic of Türkiye</li><li>• Ms <b>Ekaterine Zviadadze</b>, Head of the Agriculture and Rural Development Policy Department of Georgia</li></ul> Moderated by Mr <b>Nabil Gangi</b> , FAO Regional Deputy Representative
<b>11.20 - 11.40</b>	<b>Experiences from project countries</b> <ul style="list-style-type: none"><li>• Albania - Ms <b>Barbara Battioni Romanelli</b>, UN Fellow, FAO Albania</li><li>• Bosnia and Herzegovina - Dr <b>Grujica Vico</b>, Digital Villages Specialist</li><li>• Georgia - Mr <b>Dragan Angelovski</b>, FAO Technical Adviser</li><li>• Türkiye - Mr <b>Frank Hollinger</b>, FAO Senior Rural Finance Officer</li></ul>
<b>11.40 - 11.50</b>	<b>Q&amp;A</b>
<b>11.50 - 12.00</b>	<b>Take home messages and closing</b> <ul style="list-style-type: none"><li>• Mr <b>Dejan Jakovljevic</b>, FAO Chief Information Officer</li><li>• Mr <b>Raimund Jehle</b>, FAO Regional Programme Leader</li></ul>



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# Digital Villages in Action

## in Europe and Central Asia

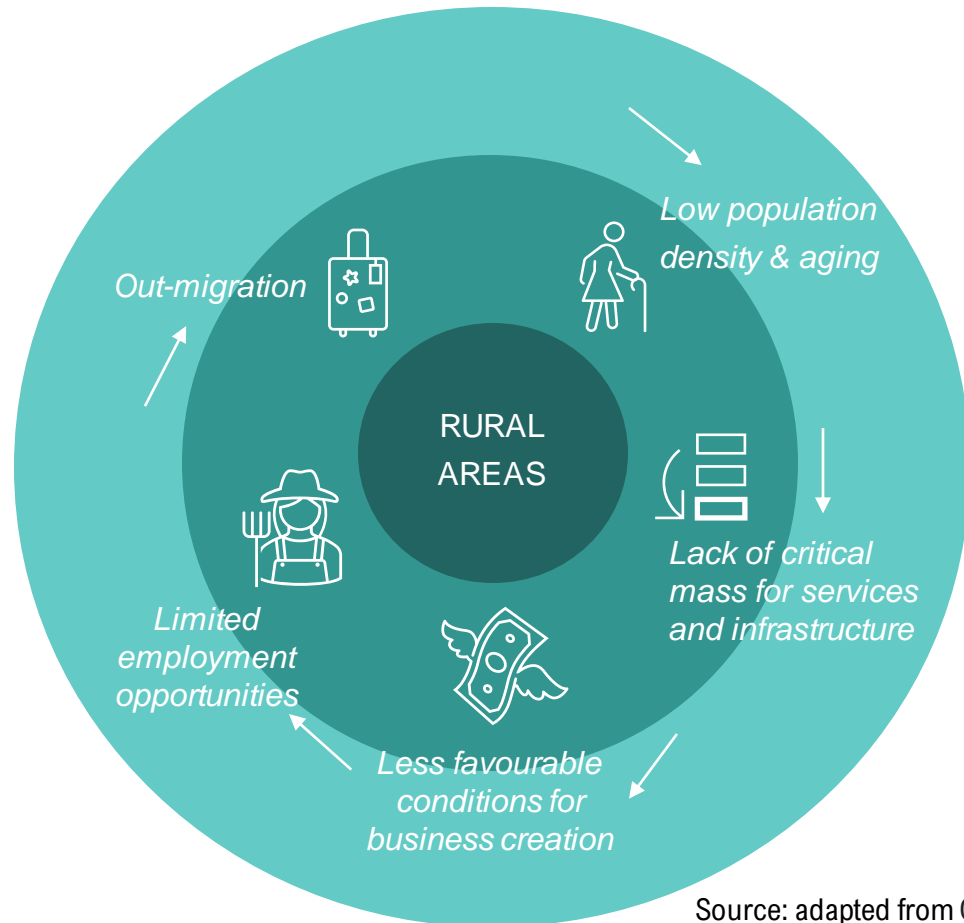
**REGIONAL EXPERIENCE**

Daniela Di Gianantonio  
*FAO Digital Agriculture Team Leader*



# The FAO Digital Villages Initiative (DVI)

*Empowering rural communities through digital innovation*



Source: adapted from Organization for Economic Cooperation and Development (OECD), 2006.

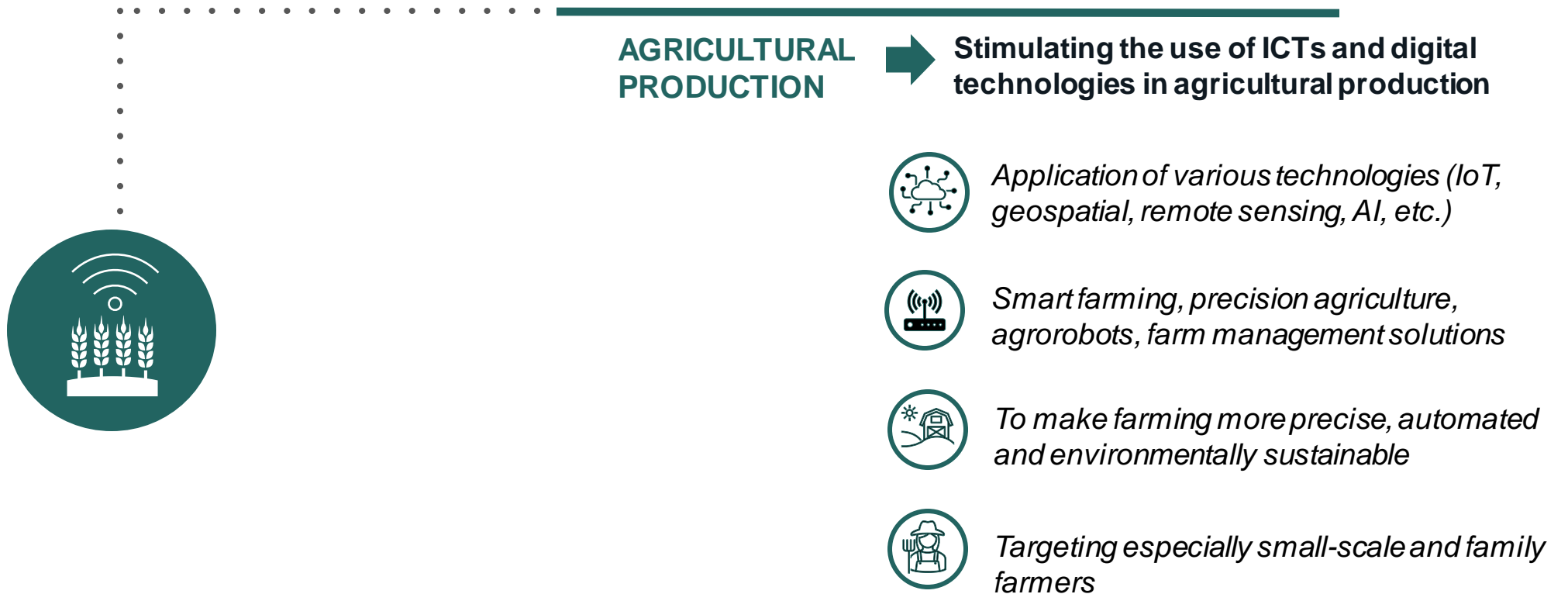
Many **rural areas are locked into a 'circle of decline'** due to limited access to resources, inadequate infrastructure, and lack of economic opportunities; finding themselves at the intersection of the triple divide – a convergence of the rural-urban, gender, and digital divides.

With the **1 000 Digital Villages Initiative**, FAO aims to harness the power of technology and innovation to bridge the gaps faced by rural areas by empowering rural communities to respond to the challenges they face.



# Improving agricultural production through DVI

*DVI focuses on 3 dimensions: the first aims at integrating ICT in agriculture production to improve productivity*



# Enhancing farmers' access to digital services

*DVI focuses on 3 dimensions: the second aims at enhancing farmers' access to digital services for agriculture*



**DIGITAL SERVICES**



**Enhancing farmers' access to services via ICT and digital means**



*Advisory and extension services, knowledge, financial and insurance, market access*



*Traditional media (TV, radio), SMS*



*Web platforms, messengers, mobile apps, e-commerce, social media*



# Improving rural livelihoods

*DVI focuses on 3 dimensions: the third aims at achieving a holistic digital transformation also outside agriculture*



*Enhance delivery of public services in agriculture and other sectors, such as tourism, education and energy*



*Developing capacities and digital skills at all levels*



*Stimulate innovation across the entire rural community*

**RURAL LIVELIHOODS**



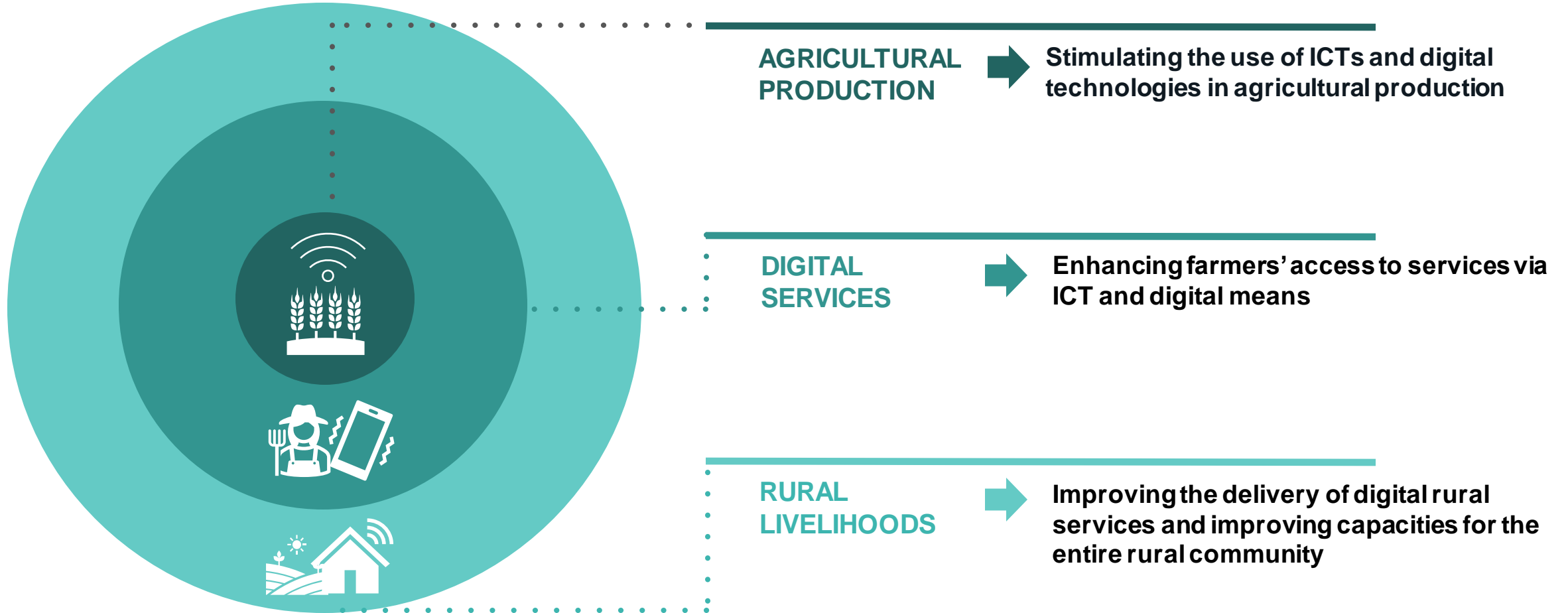
**Improving the delivery of digital rural services and improving capacities for the entire rural community**





# Achieving a holistic digital rural transformation

*Empowering rural communities through digital innovation across 3 different dimensions*

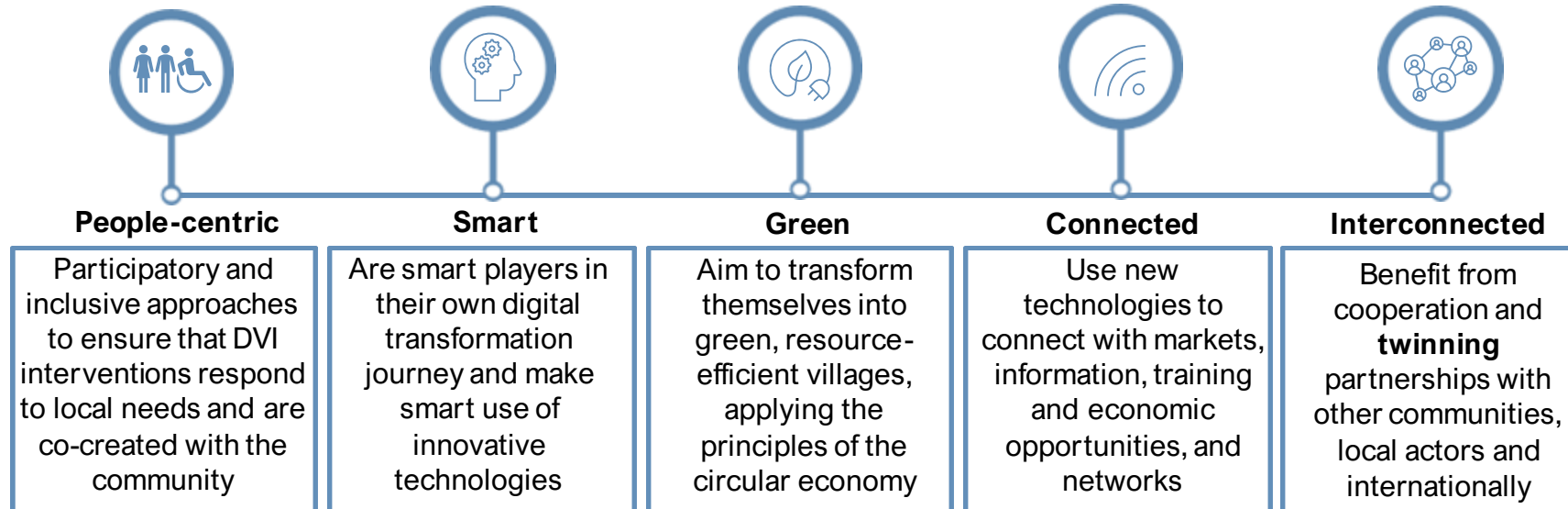


# Technology empowering people

*Digital Villages are rural communities able to harness the power of digital technologies, innovations, knowledge and partnerships*



To empower every village and rural community in Europe and Central Asia, to build on local strengths to make smart use of digital technologies to improve agricultural productivity, enhance rural livelihoods, in full respect of the environment.

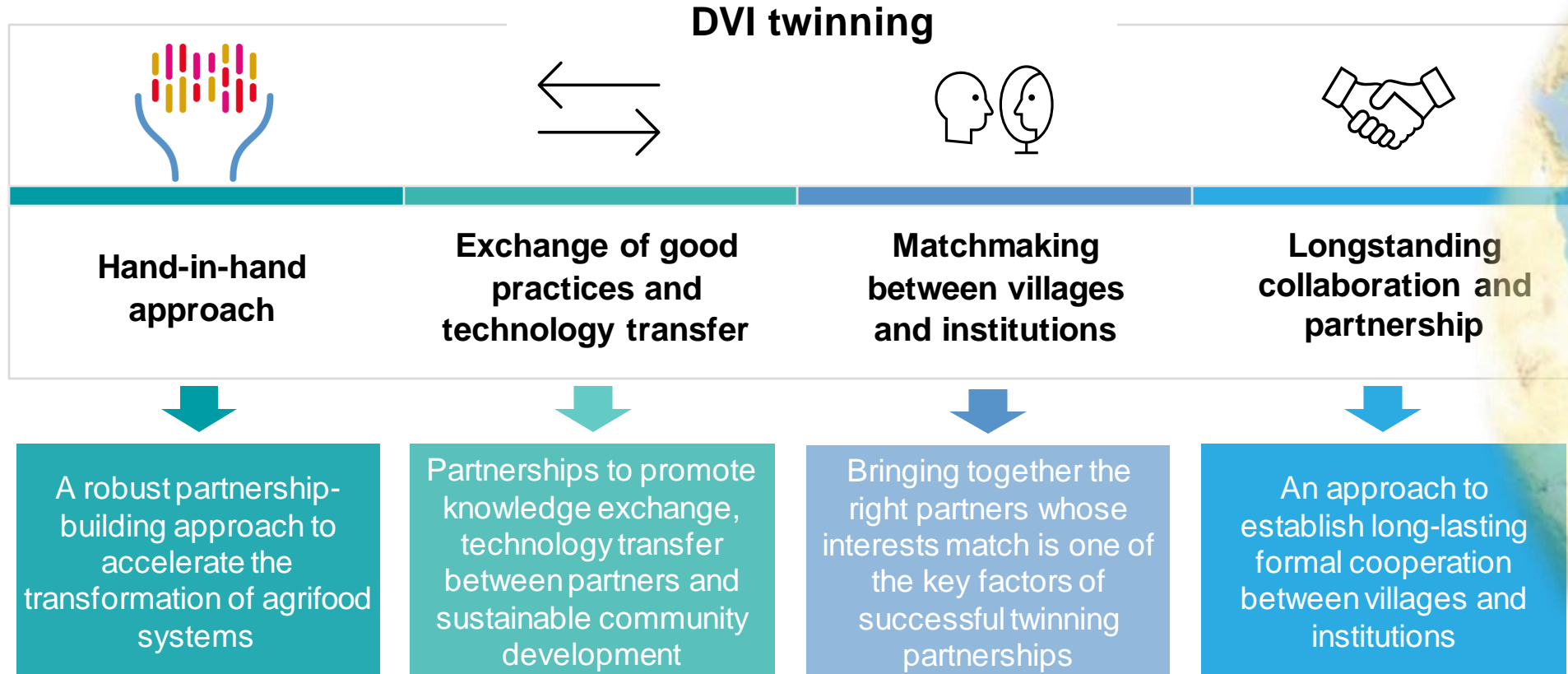


*Leaving no one behind*



# DVI twinning

*Digital Villages benefit from cooperation and alliances with other rural communities and actors locally and internationally*



# DVI Readiness Assessment



17 questions across 3 dimensions and 9 enabling factors



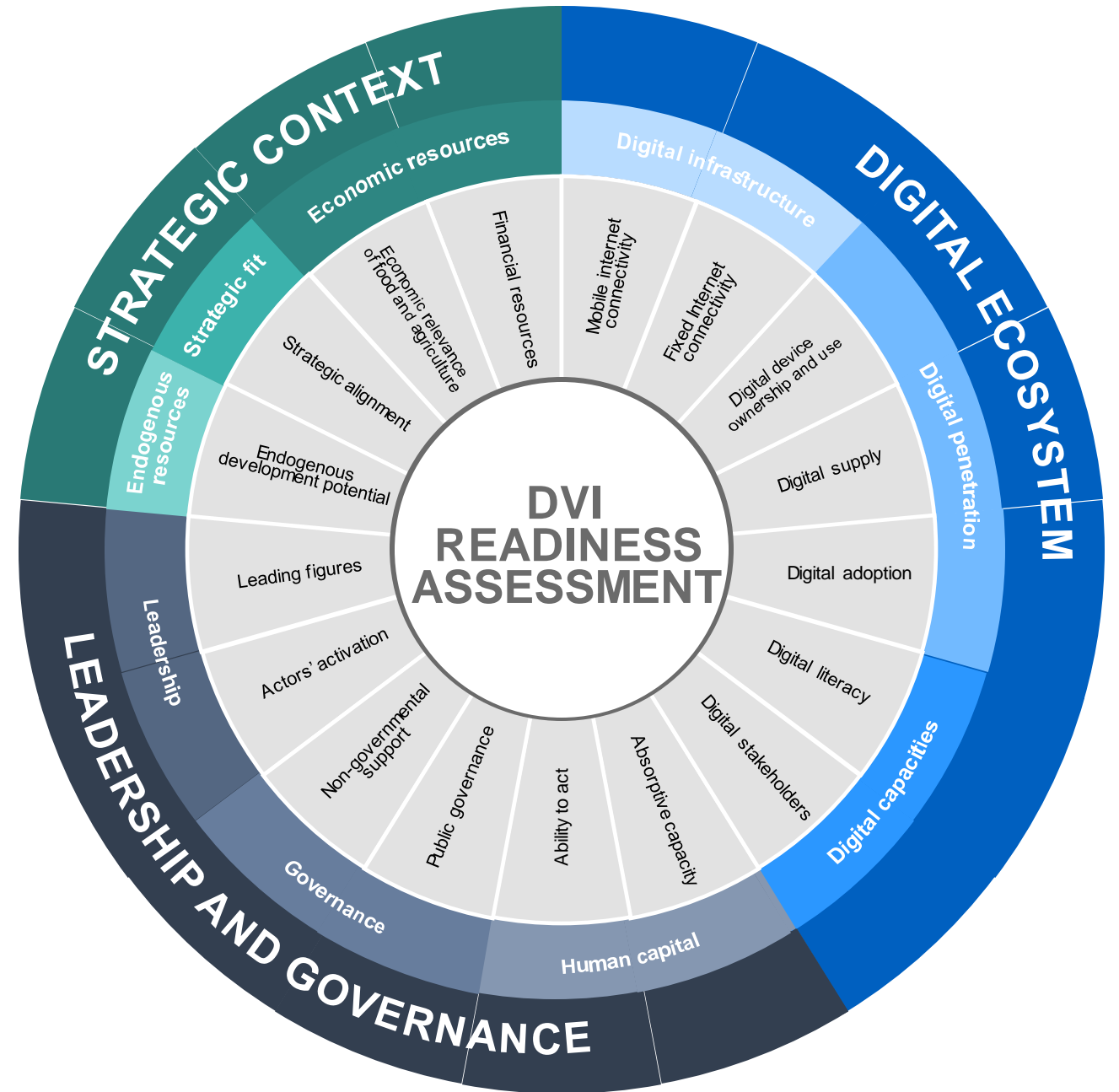
Evaluator plays critical role in determining the score, based on its analyses and interviews



Quantitative score complemented by qualitative score



Final score to determine level of readiness to undergo DVI transformation process



# Digital Ecosystem



## DIGITAL INFRASTRUCTURE

- *Mobile internet connectivity*
- *Fixed internet connectivity*



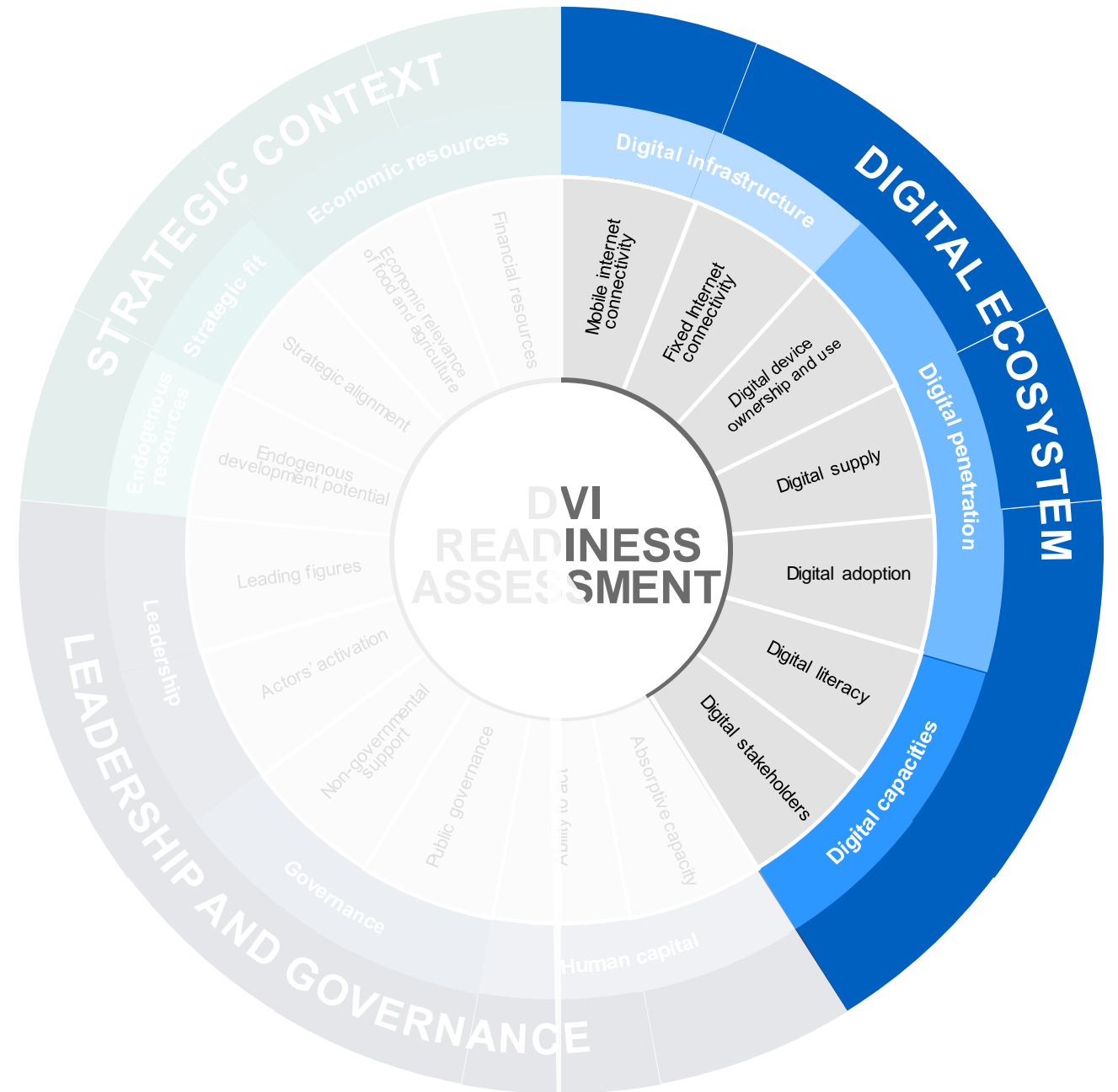
## DIGITAL PENETRATION

- *Digital device ownership and use*
- *Digital supply*
- *Digital adoption*



## DIGITAL CAPACITIES

- *Digital literacy*
- *Digital stakeholders*



# Leadership & Governance



## HUMAN CAPITAL

- *Absorptive capacity*
- *Ability to act*



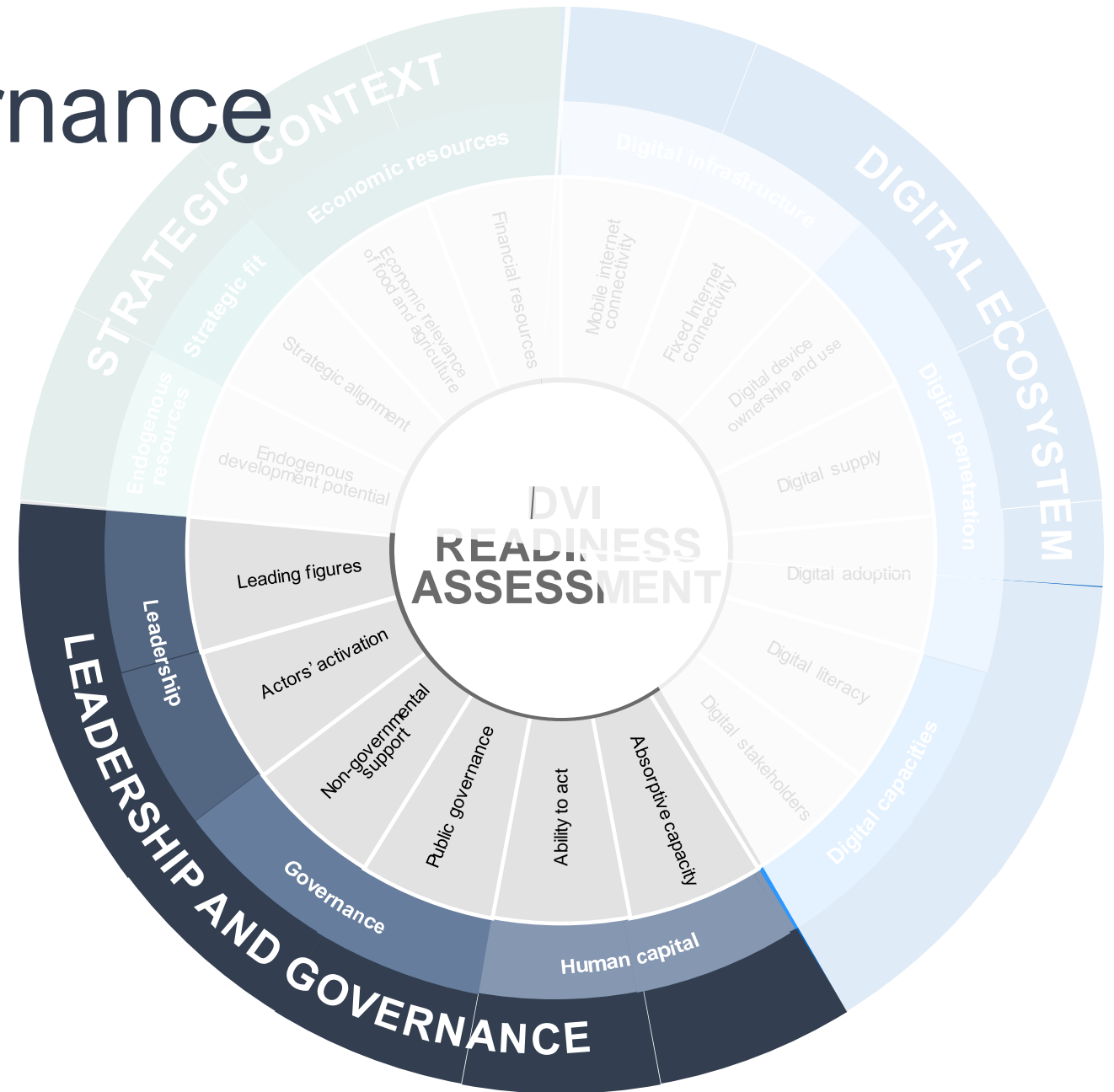
## GOVERNANCE

- *Public governance*
- *Non-governmental support*



## LEADERSHIP

- *Leading figures*
- *Actors' activation*



# Strategic context



## ENDOGENOUS RESOURCES

- *Endogenous resources*



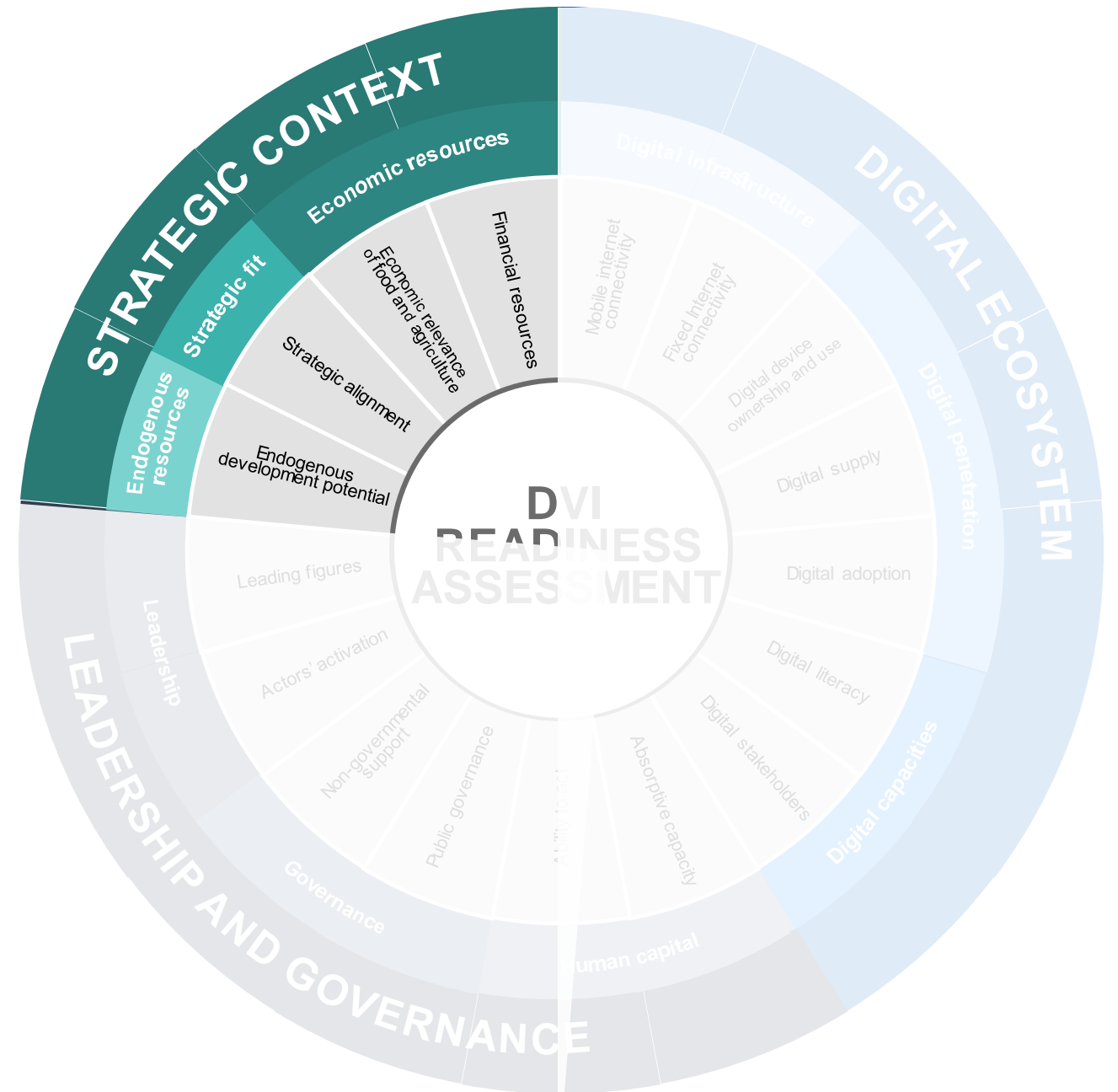
## STRATEGIC FIT

- *Strategic alignment*

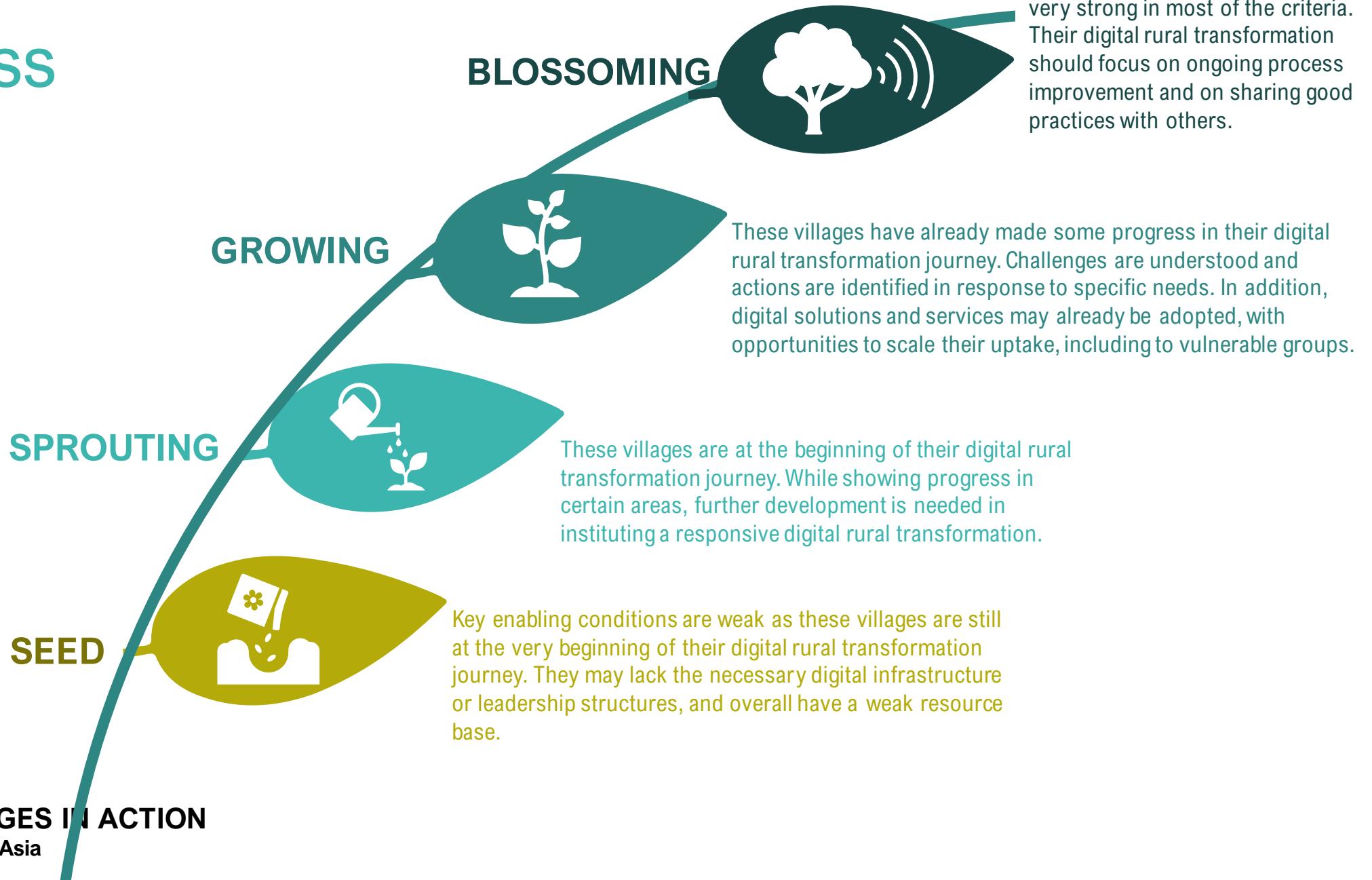


## ECONOMIC RESOURCES

- *Economic relevance of agriculture*
- *Financial resources*

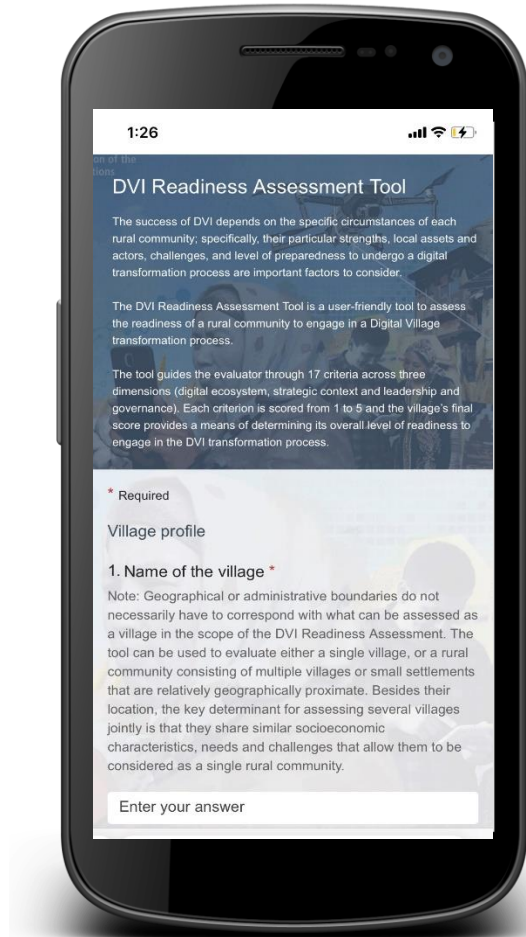


# DVI Readiness Levels





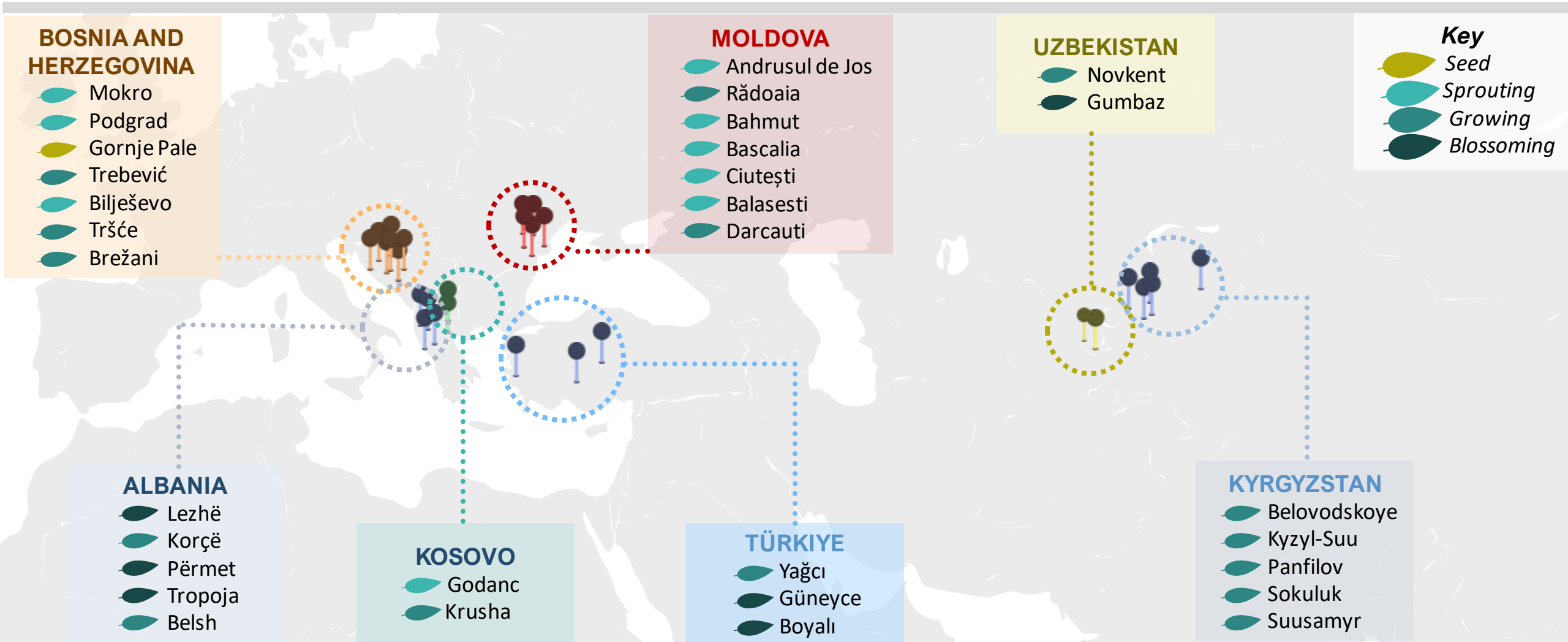
# Try the DVI Readiness Assessment tool



<https://forms.office.com/e/a9hrpyTGix>

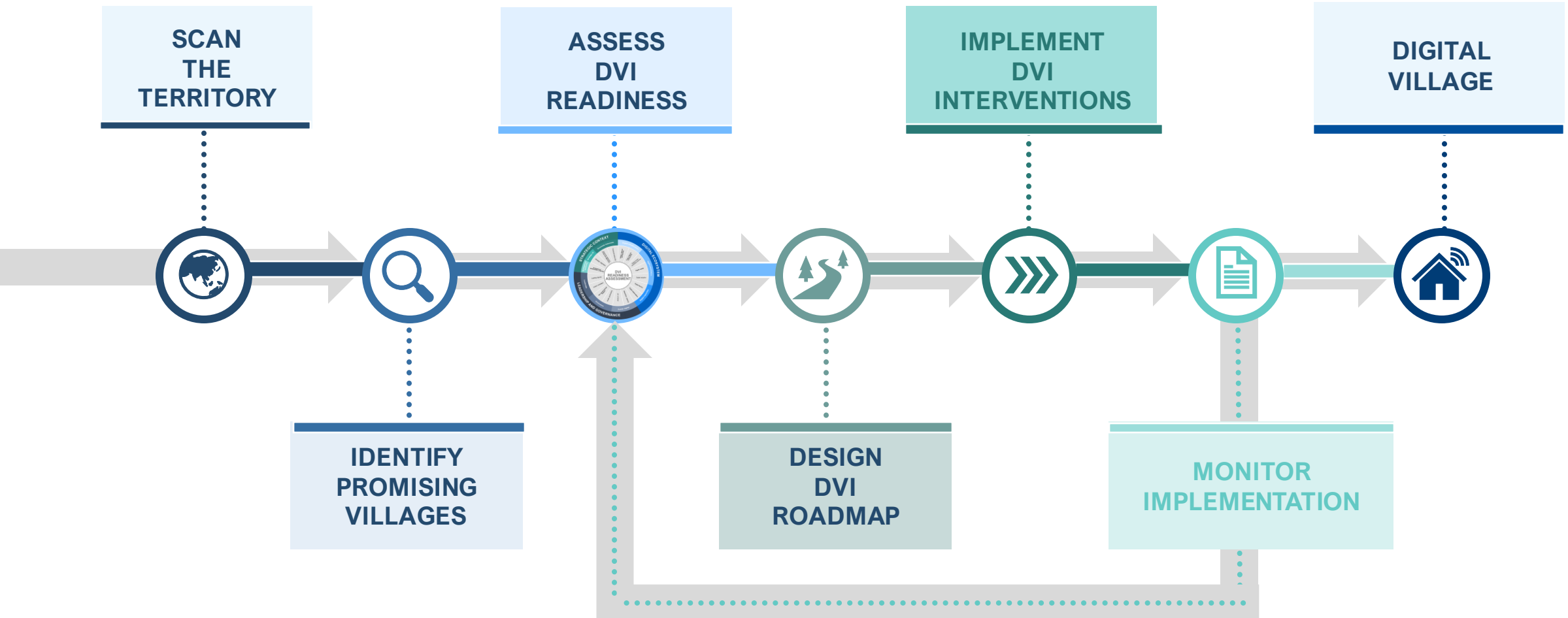


# Villages assessed through DVI Readiness Tool



# DVI in Action

*While there is no single pathway to Digital Villages, a step-by-step approach can guide the process*





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# Session 1

## Azerbaijan and Central Asia

### DVI COUNTRY EXPERIENCE



### Azerbaijan

Mr **Elmaddin Namazov**, *Programme  
Coordinator, FAO Azerbaijan*

### Kyrgyzstan

Dr **Kanat Sultanaliev**, *Executive Director, Tian  
Shan Policy Center, American University of  
Central Asia*

### Tajikistan

Ms **Veronika Sherova**, *FAO Digital Agriculture  
Analyst*

### Uzbekistan

Mr **Fenton Beed**, *Senior Agricultural Officer,  
FAO Plant Production and Protection*  
Ms **Katerina Antanevich**, *FAO Digital  
Agriculture Specialist and Sociologist (live  
from Novkent village)*



# DVI in Azerbaijan

Elmaddin Namazov

*Programme Coordinator*

FAO Azerbaijan

# Digitalization and green growth as key priorities

*Digitalization and green growth are the key priorities of the country's pathway towards socio-economic development*



From 2022 to 2026, the central objective of the socio-economic development strategy is to emphasize the significance of **digitalization in various sectors** and drive the **promotion of digital transformation**.



Establishing a development equilibrium between rural and urban regions through the implementation of **digital technologies**



Enhancing the **human capital relevant to digital technologies** and nurturing the potential for low-contact economic sectors, considering prospects and advancements in **digital applications**



Establishing a **robust regulatory framework** to expand the scope and potential of digital technologies, facilitating their **widespread adoption and utilization**

*Leveraging digitalization as a catalyst for progress*



# FAO's support leverages geospatial technologies

*FAO supported Azerbaijan with the development of several geospatial-based information management systems*



## Forest resources information management system

The provision of detailed and up-to-date information facilitates enhanced forest management, empowering local foresters to employ modern approaches in sustainable forest management (SFM)



## Mapping hazelnut production and intervention zones

The support entails utilizing GIS to map the current production status of hazelnut fields and identify geographical zones that necessitate interventions



## Land degradation neutrality decision support tool

Improving land management by offering comprehensive and up-to-date information to address land degradation and support the government's land degradation neutrality initiative



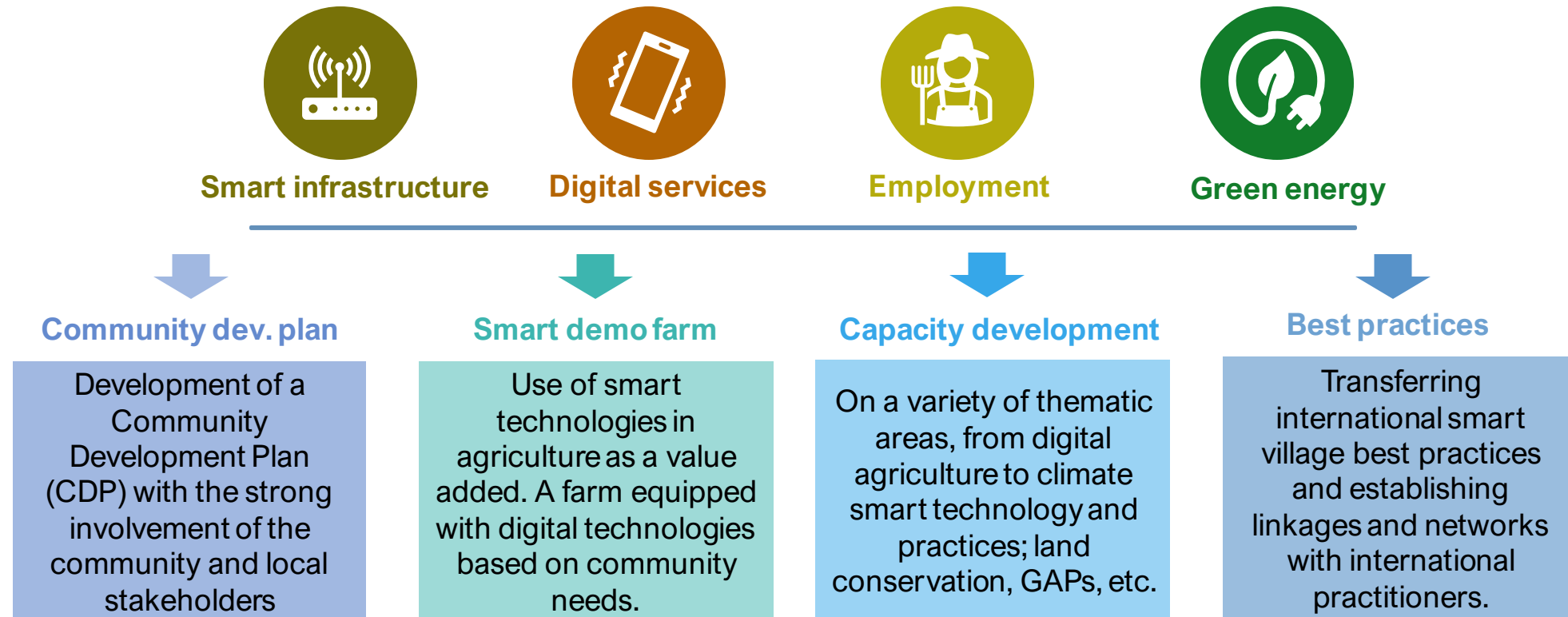
## Locust population management

Developing a geospatial data collection system to effectively manage locust populations by leveraging modern geospatial technologies that enable precise and timely data collection and analysis



# An integrated community development approach

*FAO is providing technical assistance to implement the "Smart Village" concept with an integrated community development approach*



*In a highly participatory and inclusive manner aimed at addressing several problems in a coordinated and coherent way leaving no one behind*





A woman wearing a blue headscarf and a black t-shirt with gold lettering is talking on a mobile phone. She is in a market setting with other people and goods in the background. A teal semi-transparent box is overlaid on the right side of the image, containing text.

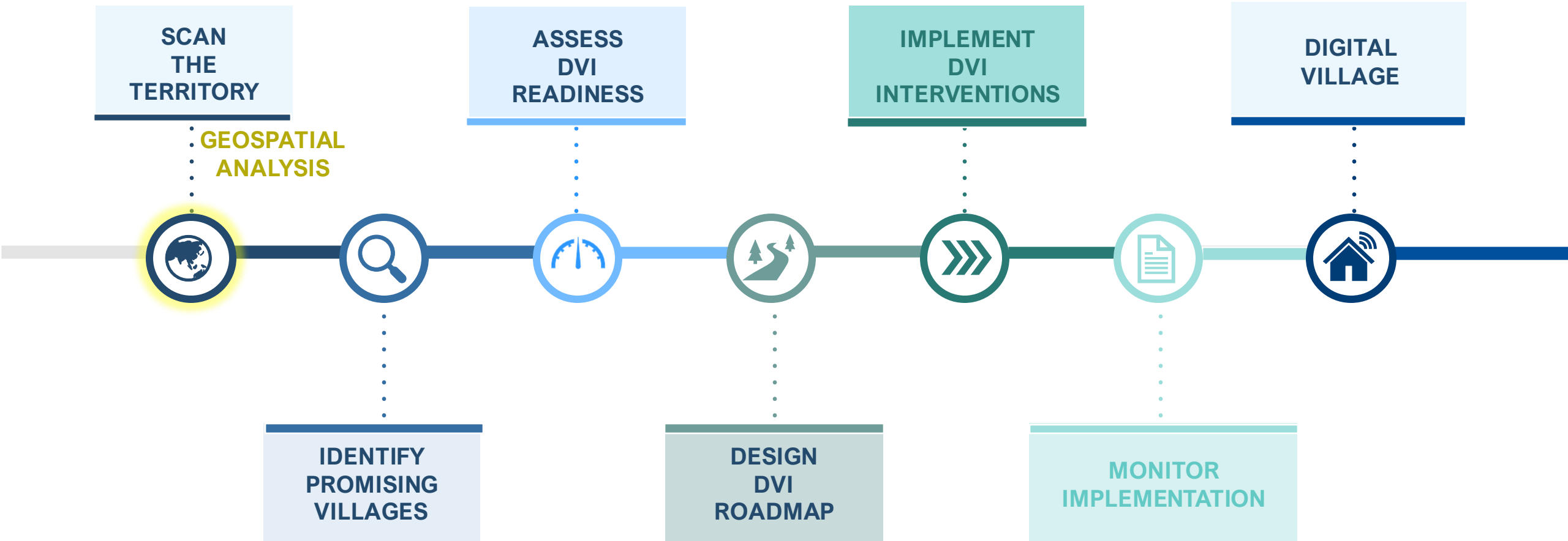
# DVI in Kyrgyzstan

**Kanat Sultanaliev**  
*Executive Director*

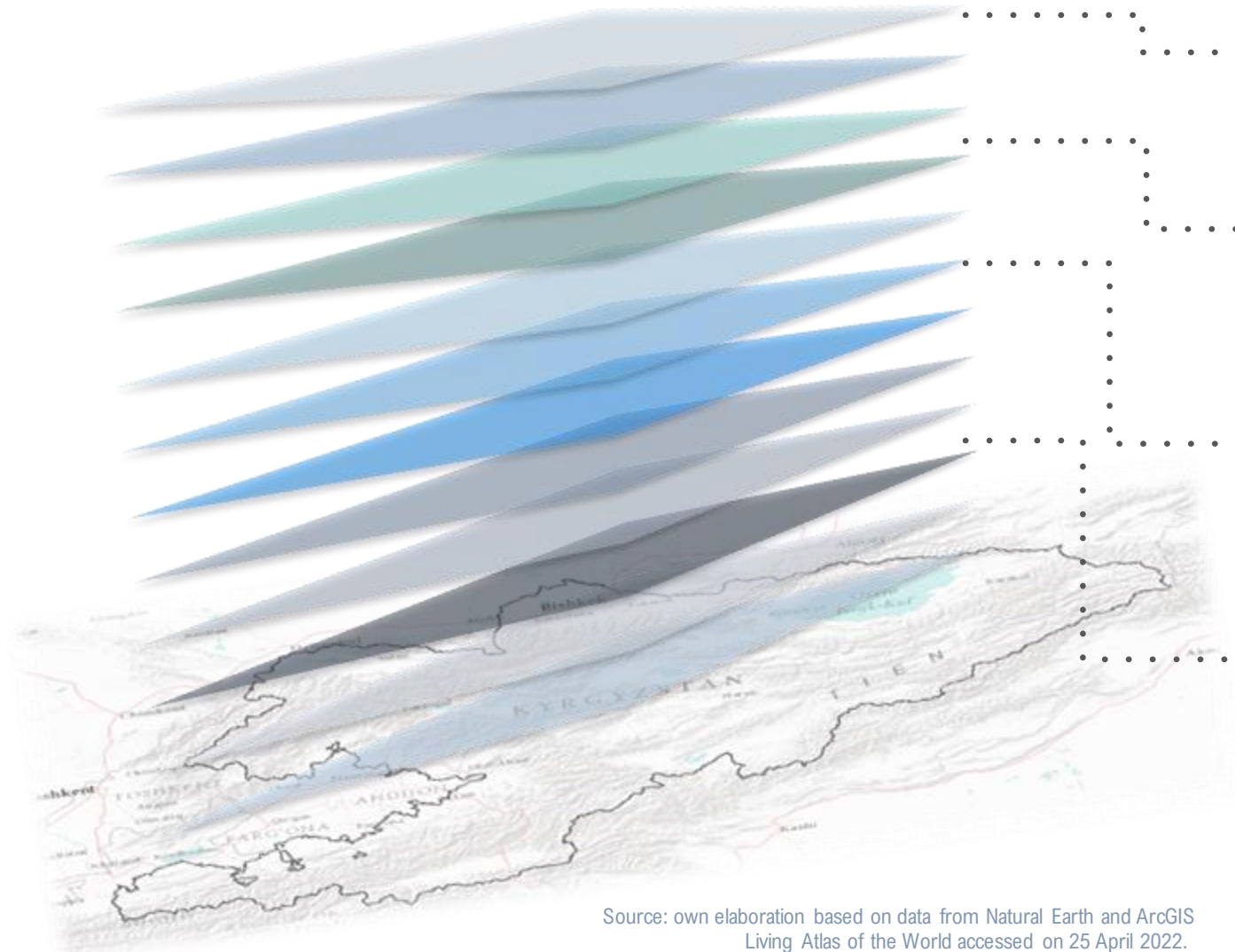
Tian Shan Policy Center of the  
American University of Central Asia

# Scanning the territory in Kyrgyzstan

*Application of geospatially-referenced criteria and indicators to identify potential Digital Villages*



# Criteria and indicators



Source: own elaboration based on data from Natural Earth and ArcGIS Living Atlas of the World accessed on 25 April 2022.



## INFRASTRUCTURE

- Mobile Network Coverage
- Rural Network



## LIVESTOCK

- Pastures
- Livestock count



## FOOD SECURITY

- Agricultural production
- Land degradation
- Access to markets



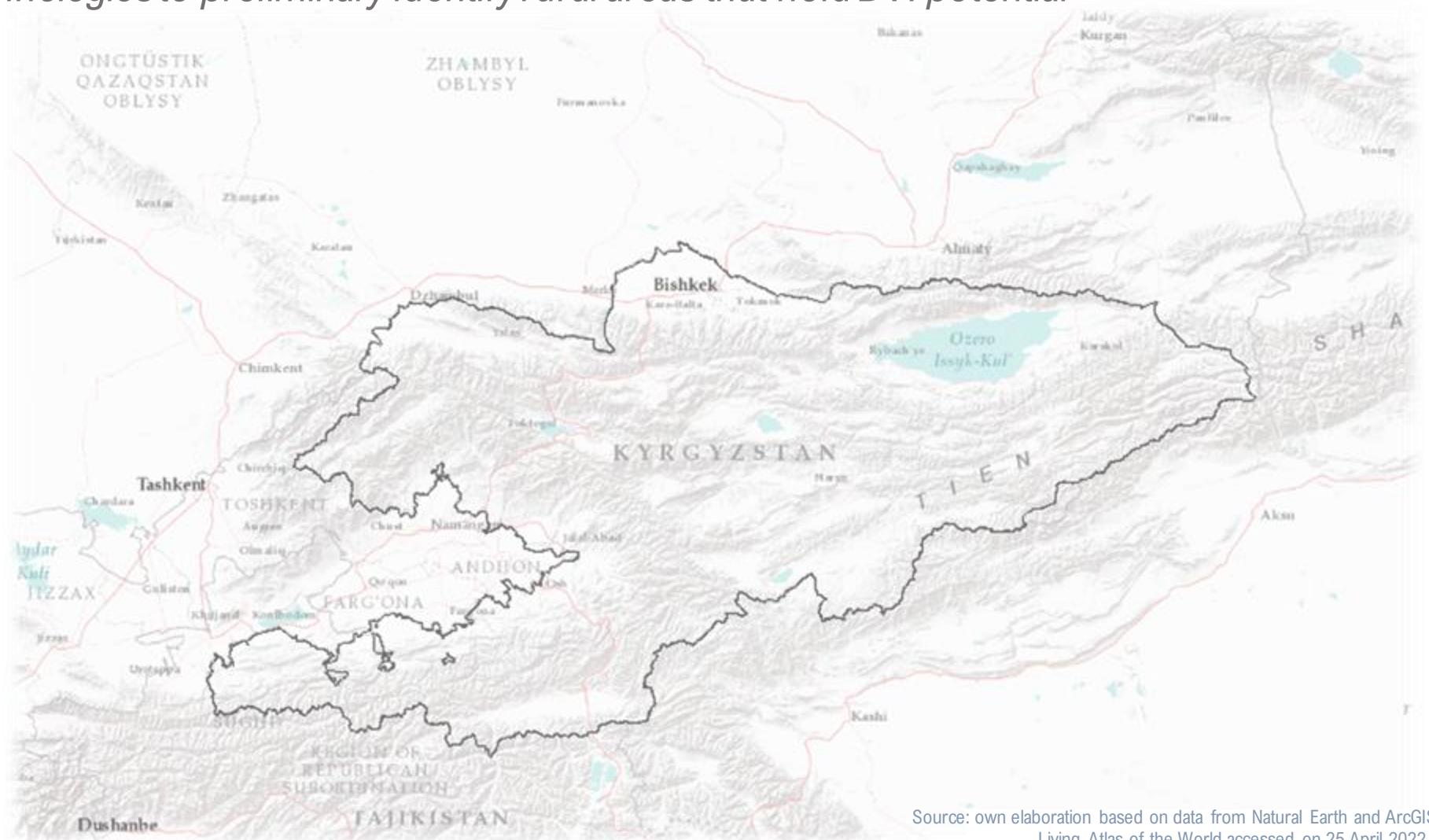
## RURAL & ECONOMIC DEVELOPMENT

- Municipalities
- Population density
- Poverty level
- Export orientation
- Average monthly salary
- New jobs created



# GIS-based country scanning in Kyrgyzstan

*Applying geospatial technologies to preliminary identify rural areas that hold DVI potential*



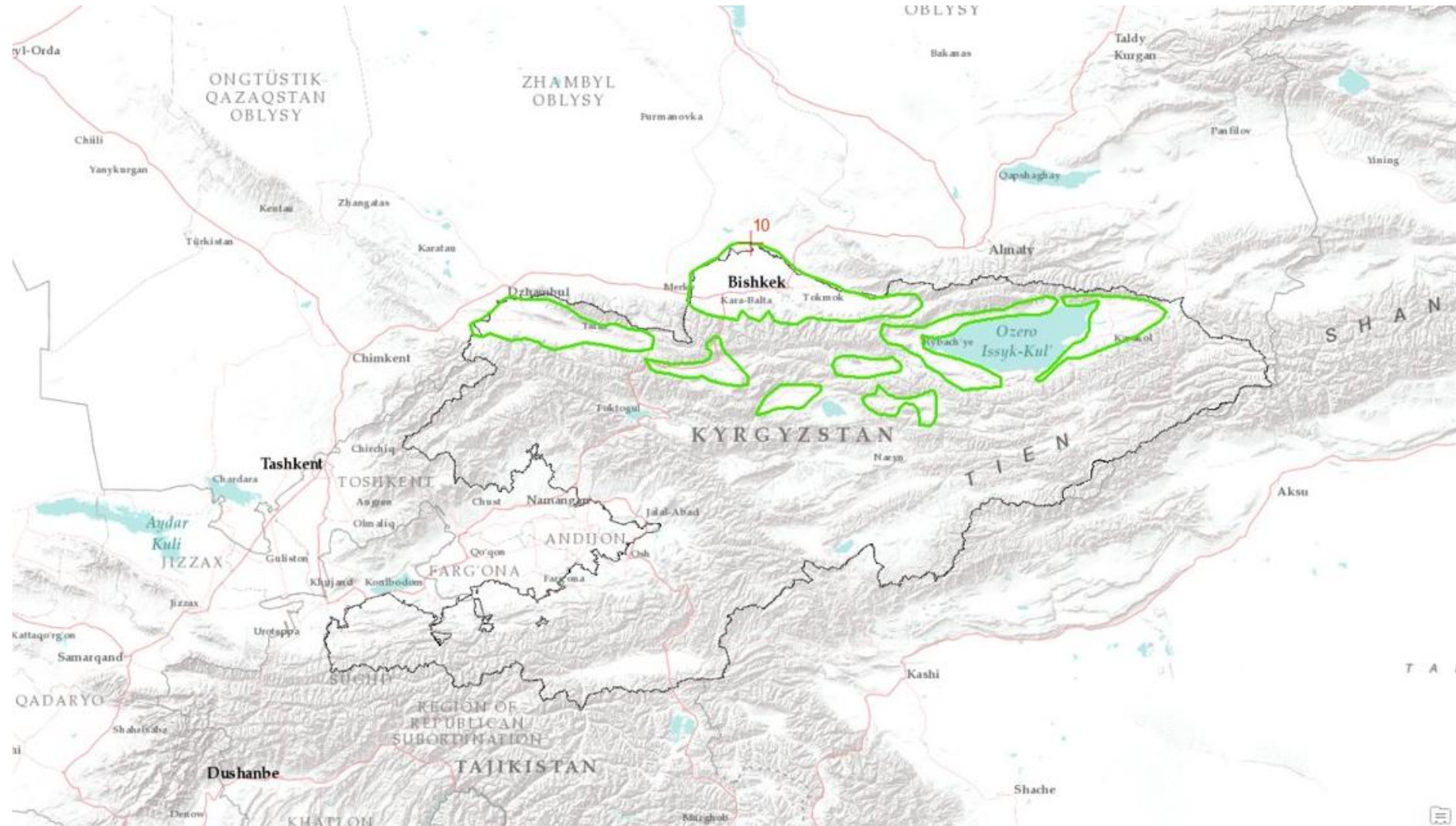
Source: own elaboration based on data from Natural Earth and ArcGIS Living Atlas of the World accessed on 25 April 2022.



# GIS-based country scanning in Kyrgyzstan

*Mobile internet coverage is a crucial indicator to identify candidate areas for DVI*

4G Mobile coverage



Source: own elaboration based on data from Natural Earth and ArcGIS Living Atlas of the World accessed on 25 April 2022.

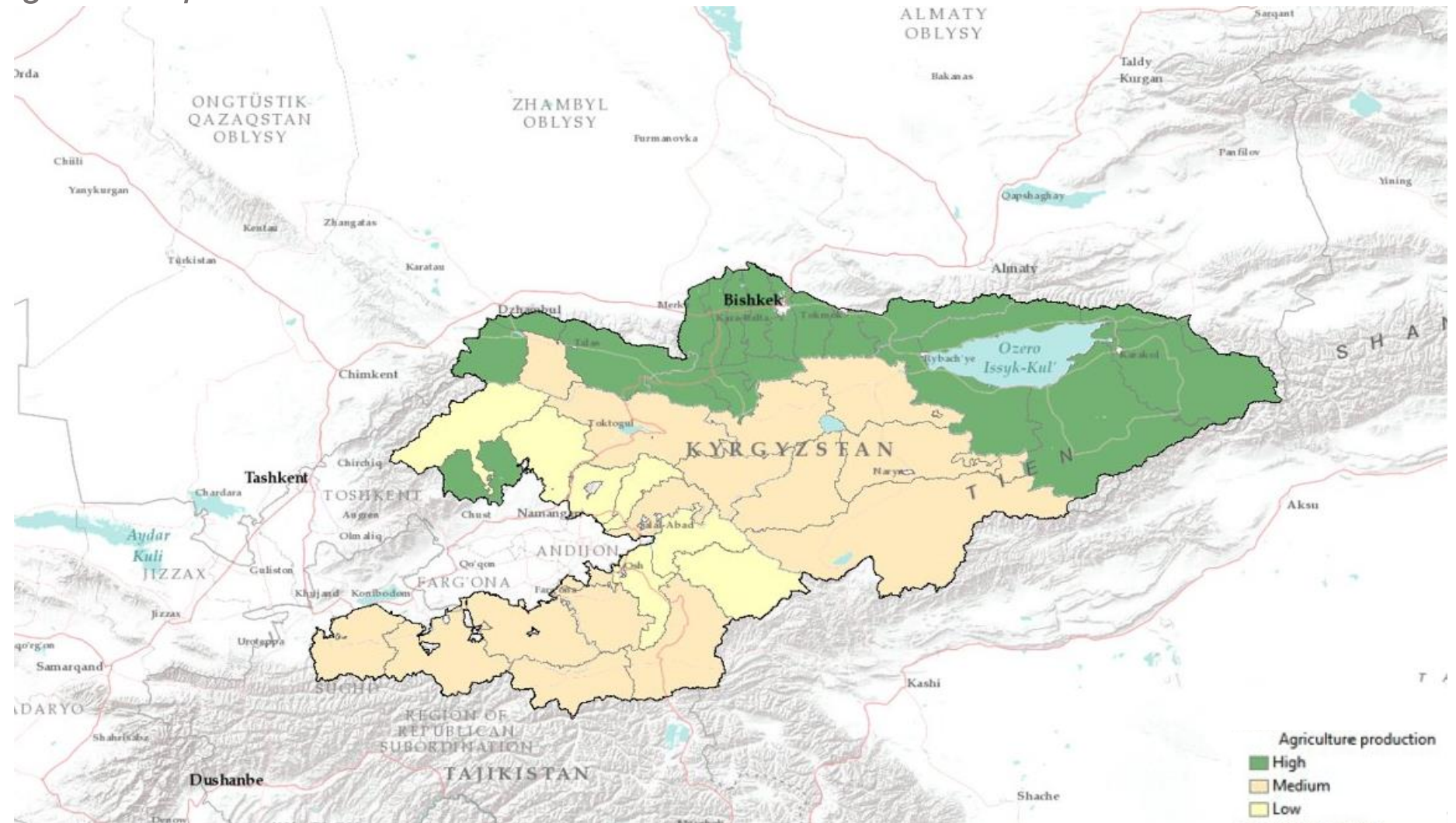


# GIS-based country scanning in Kyrgyzstan

*Areas with prevalence of agriculture production*

Mobile coverage

Agriculture production



Source: own elaboration based on data from Natural Earth and ArcGIS Living Atlas of the World accessed on 25 April 2022.



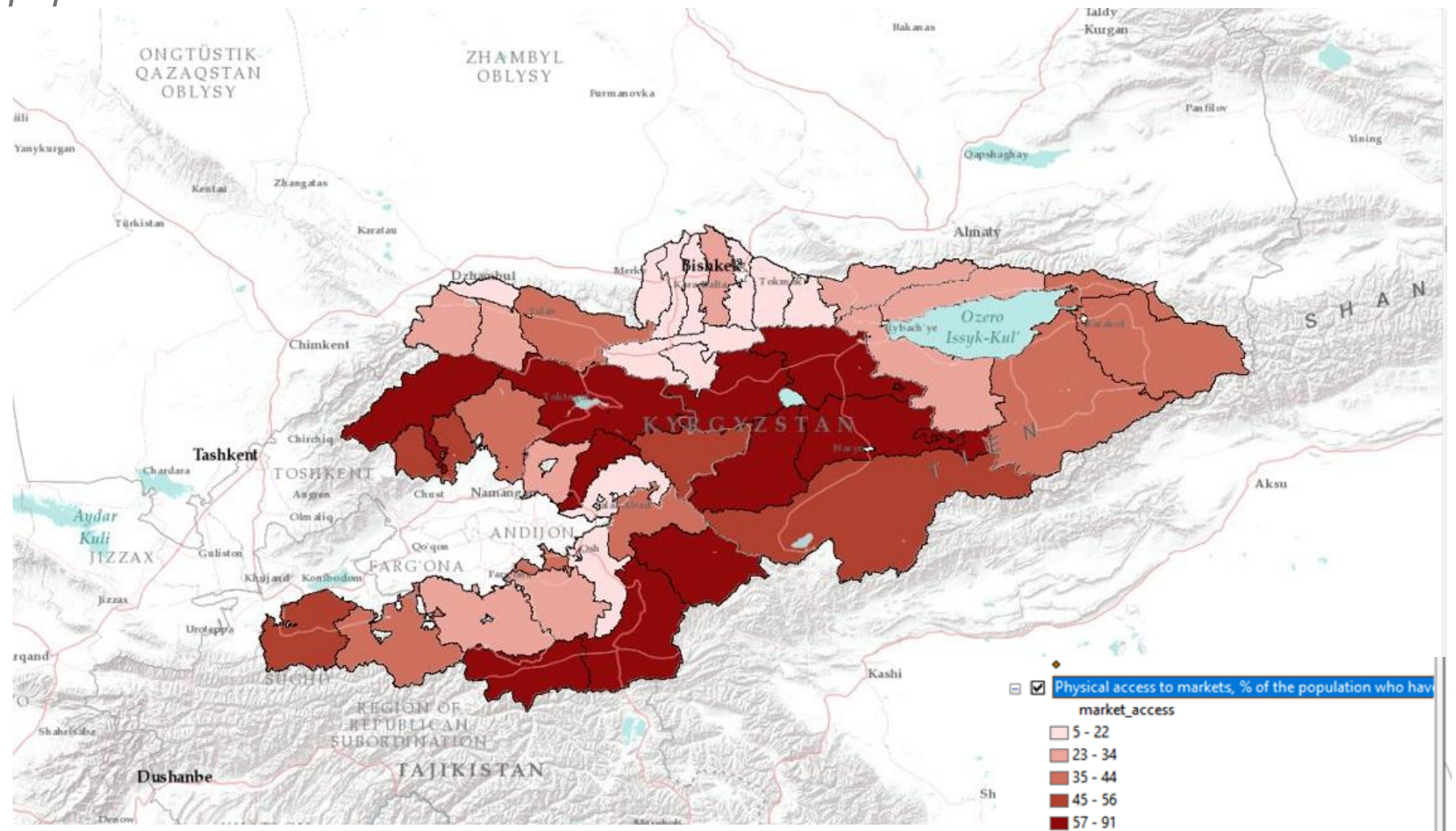
# GIS-based country scanning in Kyrgyzstan

*Access to markets: % of population needed more than 3 hours to reach nearest town*

Mobile coverage

Agriculture production

Access to markets



Source: own elaboration based on data from Natural Earth and ArcGIS Living Atlas of the World accessed on 25 April 2022.



# GIS-based country scanning in Kyrgyzstan

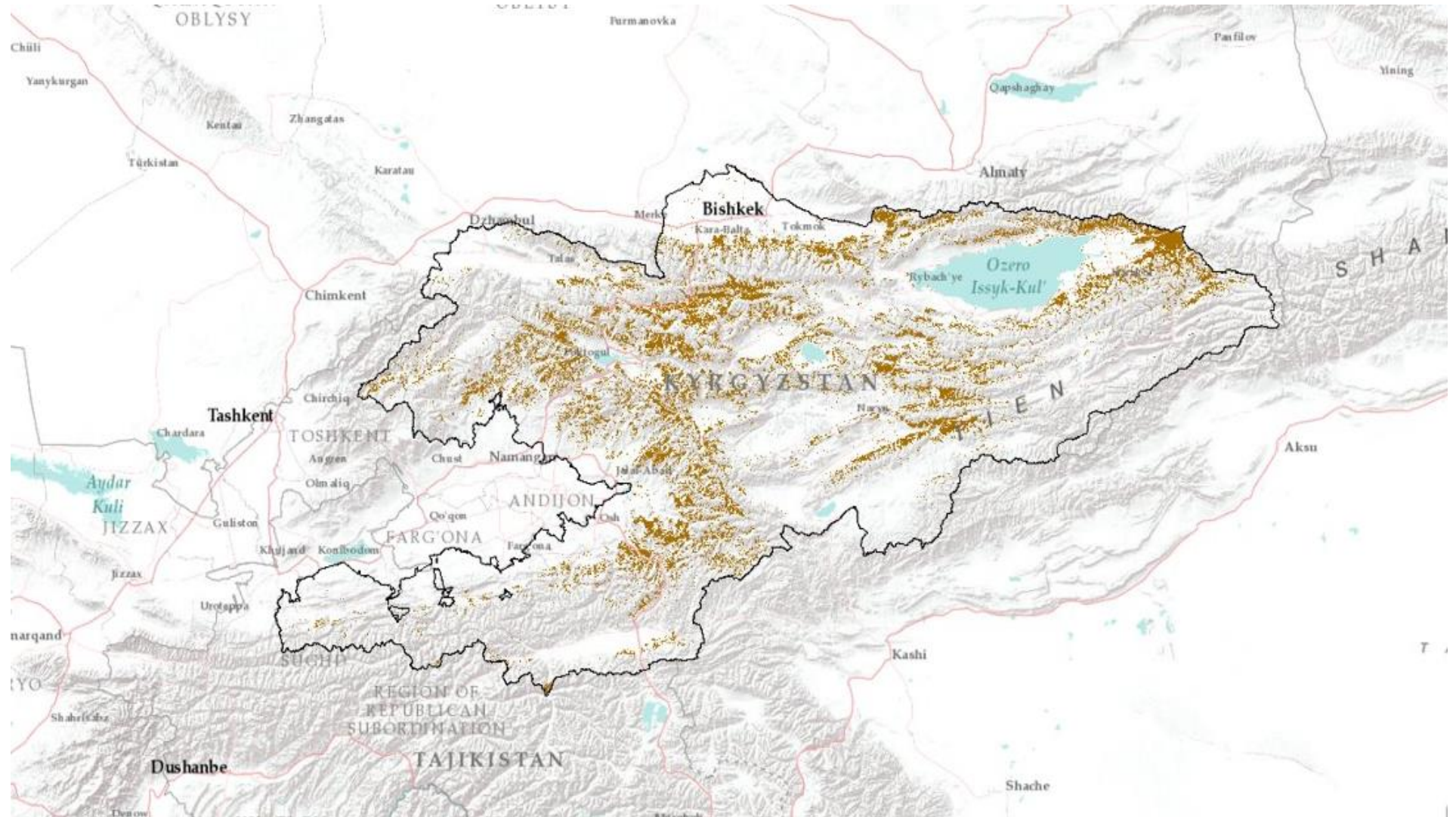
## Pastures

Mobile coverage

Agriculture production

Access to markets

Pastures



Source: own elaboration based on data from Natural Earth and ArcGIS Living Atlas of the World accessed on 25 April 2022.





# GIS-based country scanning in Kyrgyzstan

*Land degradation*

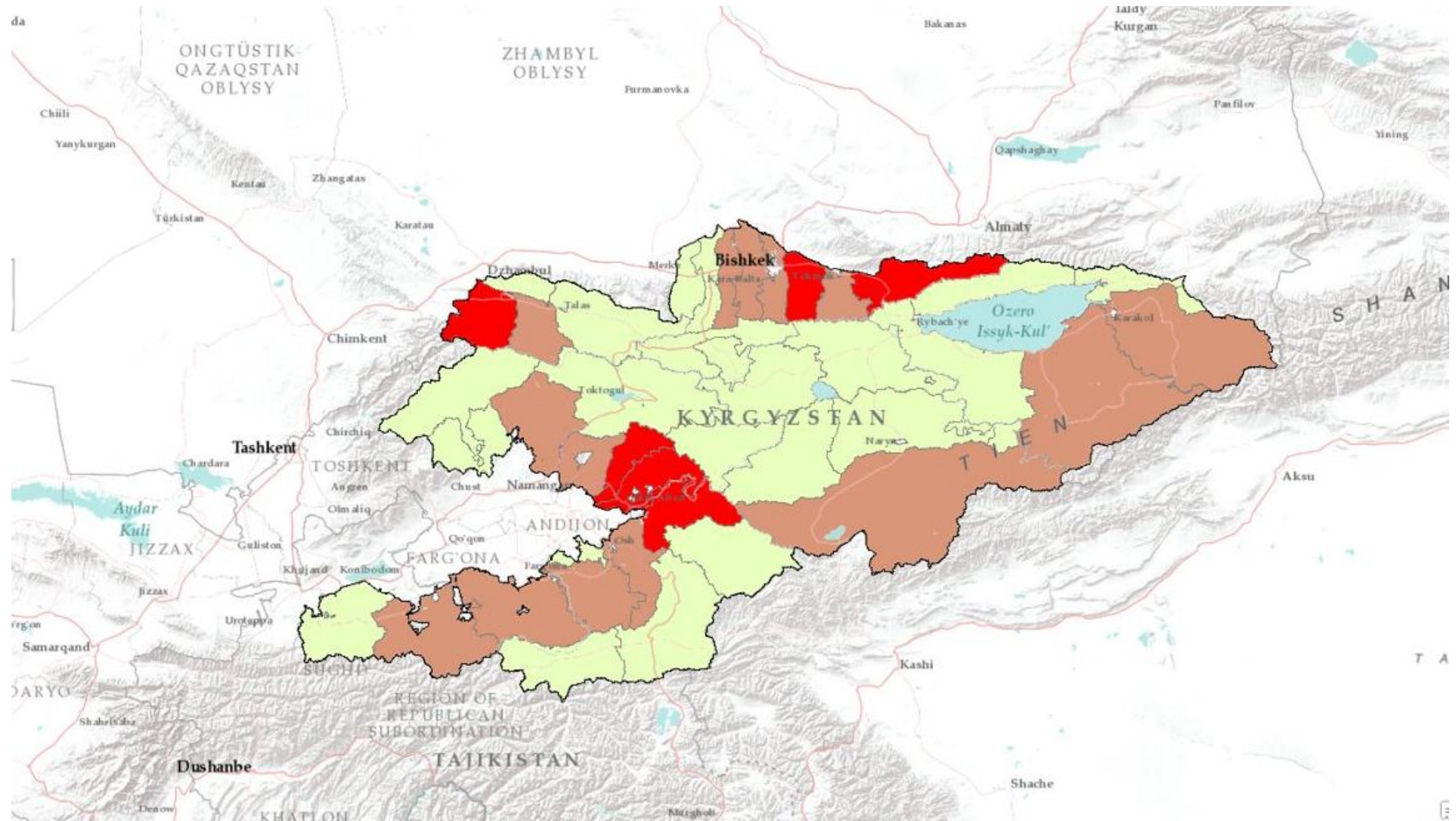
Mobile coverage

Agriculture production

Access to markets

Pastures

Land degradation



# GIS-based country scanning in Kyrgyzstan

*Municipality level analysis*

Mobile coverage

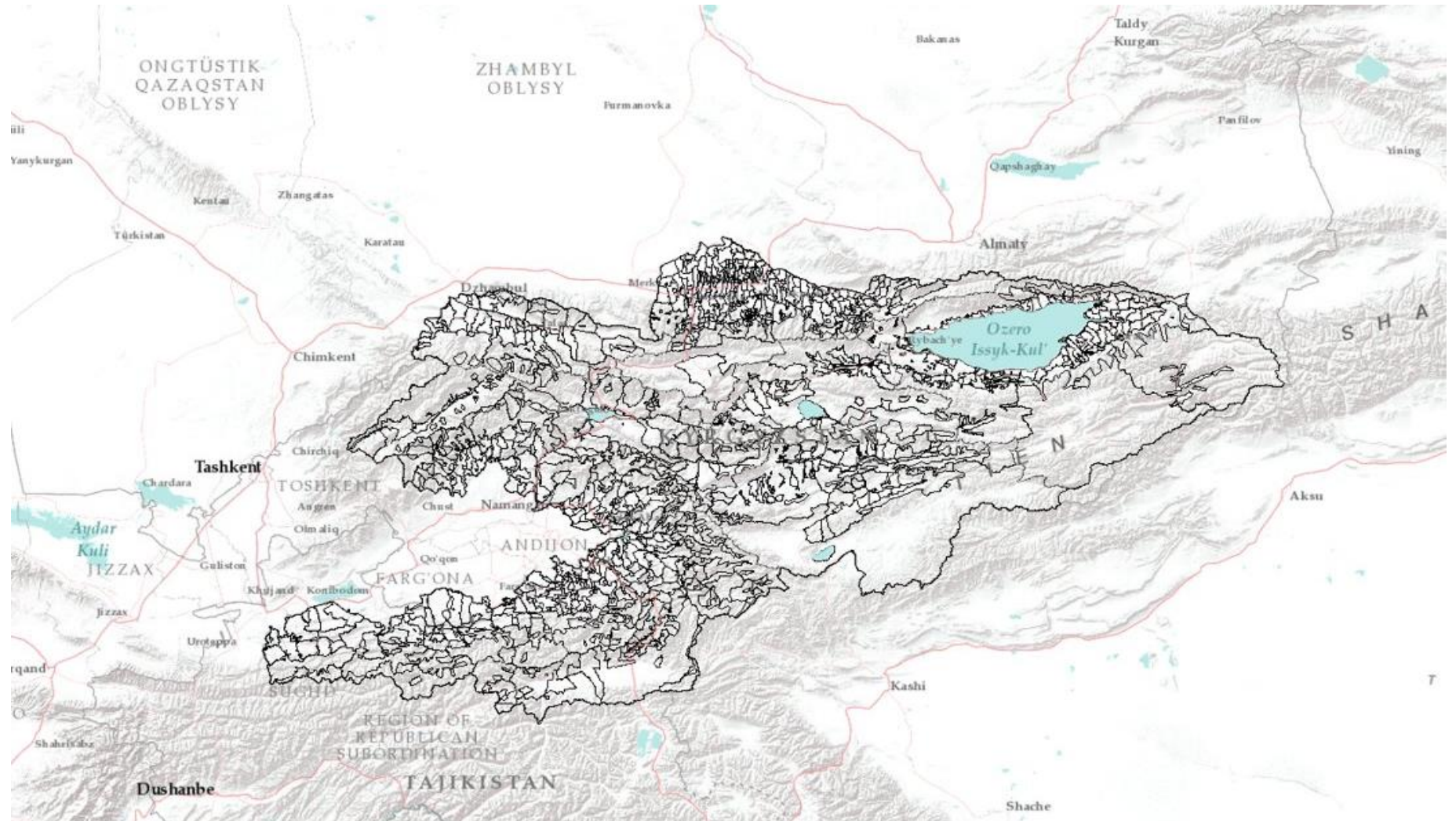
Agriculture production

Access to markets

Pastures

Land degradation

Municipalities

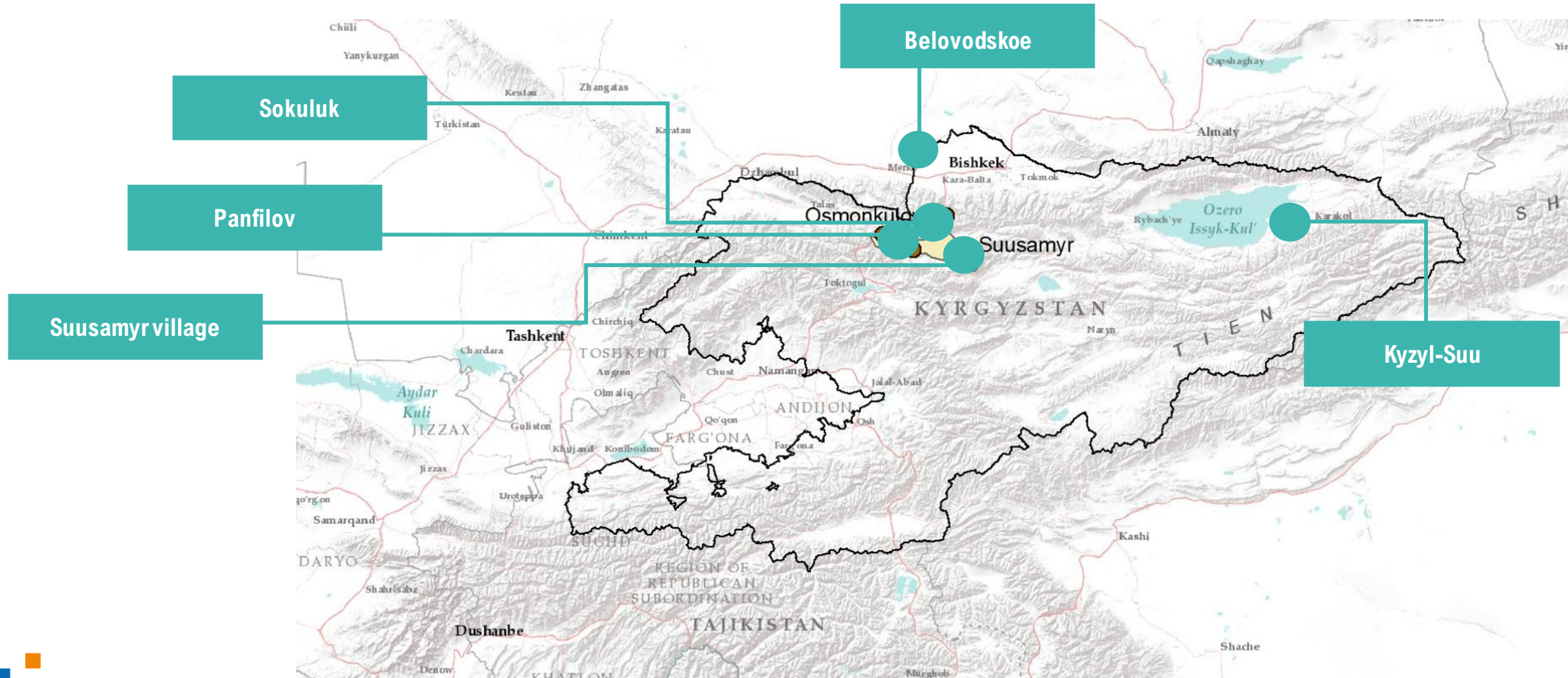


**DIGITAL VILLAGES IN ACTION**  
Europe and Central Asia

Source: own elaboration based on data from Natural Earth and ArcGIS Living Atlas of the World accessed on 25 April 2022.

# GIS-based country scanning in Kyrgyzstan

*Identified regions and rural communities*



# DVI in Tajikistan

*Veronika Sherova*  
FAO Digital Agriculture Analyst

# Context and challenges in Tajikistan



*Predominantly rural population heavily dependent on agriculture*



*Disaster-prone country, significantly suffering from climate change*



*Limited access to technology and low ownership of digital devices*



*Insufficient infrastructure, including electricity, mobile network and internet penetration*



*Low digital literacy among rural population and turnover of qualified personnel in the government*



Vision



By 2030, the development of digital agriculture in Tajikistan will empower every jamoat, every village, every farmer and all people living in rural areas, women and men, to achieve a more sustainable agricultural production and competitiveness, enhance food security and safety, using resources more sustainably and building resilience to climate change

Impact

Stronger institutions

Physical infrastructure

Knowledge transfer

Enhance food security

Modernize the food safety system

Efficient functioning of value chains

Tajikistan's agricultural priorities

Outcomes (Pillars)

Developing the foundations for digital agriculture

Harnessing data and building e-government systems for agriculture

Advancing agricultural knowledge, skills and innovation

Growing a market ecosystem

Outputs (Workstreams)



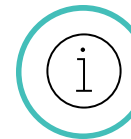
Infrastructure developed

Rural connectivity  
Electrifying rural areas  
Infrastructure for agriculture



Data

Data integration  
Data-based decision making



Awareness & Digital skills

Traditional media campaign  
Digital campaign  
Digital skills: public sector  
Digital skills: rural areas



Existing solutions support



Increase farm productivity

Knowledge & advisory  
Smart farming  
Farm management



Regulatory reforms in place

Governance  
Incentives  
Data protection and cybersecurity



eGovernment Systems

Architecture  
Registries  
Market & Trade  
Better production  
Weather & Water  
Disaster risk management



Innovation, academia, research & development

Demo farms  
University programme  
Research & development  
Innovation



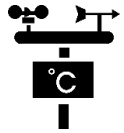
Enhance access to markets and finance



Digital Villages

Programmes

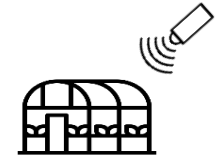
# Entry points for DVI in Tajikistan



*Early warnings and agromet advice to farmers*



*Agritourism and digital marketing in agricultural heritage communities*



*Smart farming in greenhouses using low-cost sensors assembled with communities*





**DVI in Uzbekistan**  
*Fenton Beed*  
FAO Senior Agricultural Officer



# Smart farming for the future generations

*Empowering small-scale farmers and rural communities with affordable and adaptable technologies and practices*



4 years, funded by Republic of Korea



Promoting sustainable agriculture in **Uzbekistan and Viet Nam**



In Uzbekistan, more than 10 rural communities across **Ferghana valley**



**Yields increased** by 90-140 percent depending on the crop



Source: own elaboration, based on UN Geospatial, accessed in May 2023



# Open-source IoT smart devices

Simple and affordable connected sensors to gather environmental parameters and send them to farmers' phones



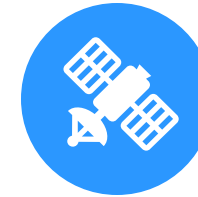
## Open-source hardware

A device that is relatively easier to program and customize because all hardware specifications are openly available



## Internet-of-things

Enables to create a network of interconnected devices, sensors and systems allowing for remote monitoring



## Remote Sensing

Connected sensors allow to control of environmental parameters on the temperature, humidity, light and soil moisture in the greenhouse



## Farmers' phones

Farmers receive the information through a mobile interface, which also sends a notification and alerts in case certain parameters are reached



# Smart farming for the future generations

*Empowering small-scale farmers and rural communities with affordable and adaptable technologies and practices*

## SMART FARMING

Simple, yet innovative, technologies and practices to increase farming efficiency in an affordable and clever way, without necessarily relying on the latest technology



**Agricultural  
production**

**Post-harvest,  
safety & marketing**

**Capacity  
building**



Improving greenhouse structures, drip irrigation systems, bumblebees for pollination, efficient use of inputs and pesticides



Enhancing post-harvest skills, infrastructure, and food safety practices, leading to improved marketing opportunities



Continuous training for farmers and their neighbours across over 10 villages of Fergana valley to foster knowledge transfer



©FAO/H. Muminjanov





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# Session 2

## Western Balkans, Georgia and Türkiye

### DVI COUNTRY EXPERIENCE



### Albania

Ms **Barbara Battioni Romanelli**  
UN Fellow, FAO Albania

### Bosnia and Herzegovina

Dr **Grujica Vico**  
FAO Digital Villages Specialist

### Georgia

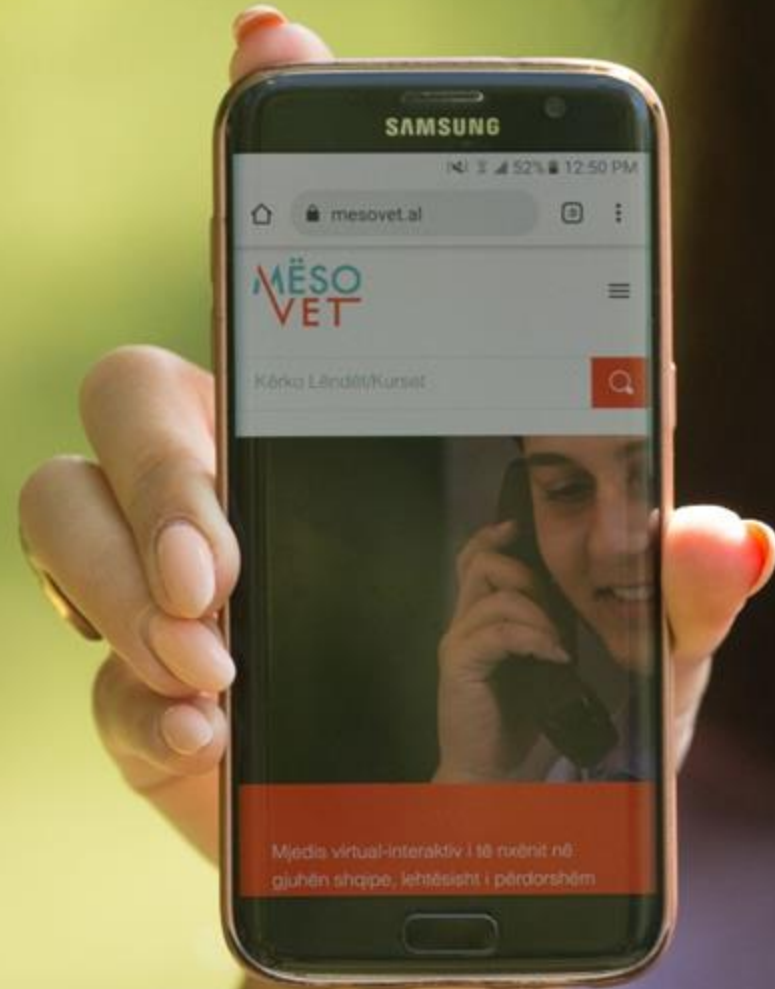
Mr **Dragan Angelovski**  
FAO Technical Adviser

### Türkiye

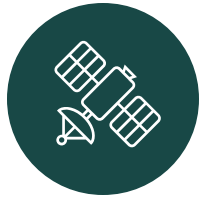
Mr **Frank Hollinger**  
FAO Senior Rural Finance Officer

# DVI in Albania

Barbara Battioni Romanelli  
*UN Fellow, FAO Albania*



# DVI-approach pilots in 4 villages



## Precision agriculture

Farmers and extensionists trained on precision agriculture technologies (face-to-face VET training) in partnership with ILO



## Online training

Blended training approach: face-to-face training complemented with online training through "mesovet" online platform and mobile app



## Agritourism

Couple with agritourism capacity development to strengthen value chains, increase competitiveness and provide income diversification opportunities

In Përmet, to increase availability of digital soil data to improve data-base decision making for small-scale farmers; the first of its kind in Albania

## Digital soil maps

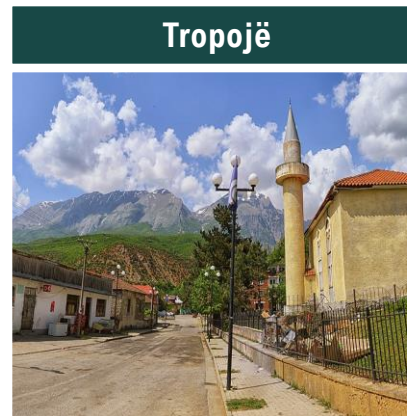
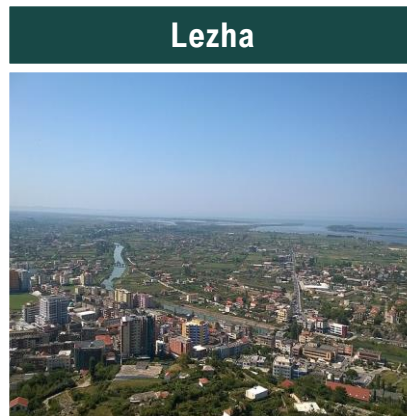
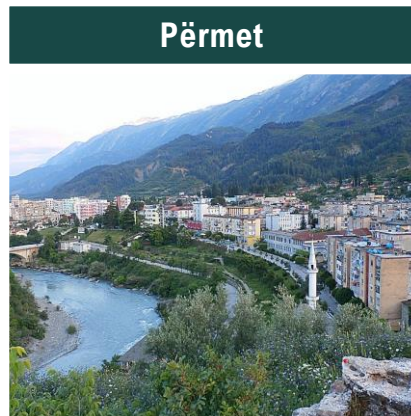


Map No. 3769 Rev. 7 UNITED NATIONS June 2012 Department of Field Support Cartographic Section

Source: own elaboration, based on UN Geospatial, accessed in May 2023



# DVI Readiness Assessment



From top left to bottom right: ©Pasztila aka Attila Terbócs, CC BY-SA 4.0; ©Pasztila aka Attila Terbócs, CC BY-SA 4.0; ©Thanas Todhe (Guri Q..., CC BY 3.0); ©2000 at Italian Wikipedia, CC BY-SA 4.0; ©Pasztila aka Attila Terbócs, CC BY-SA 4.0



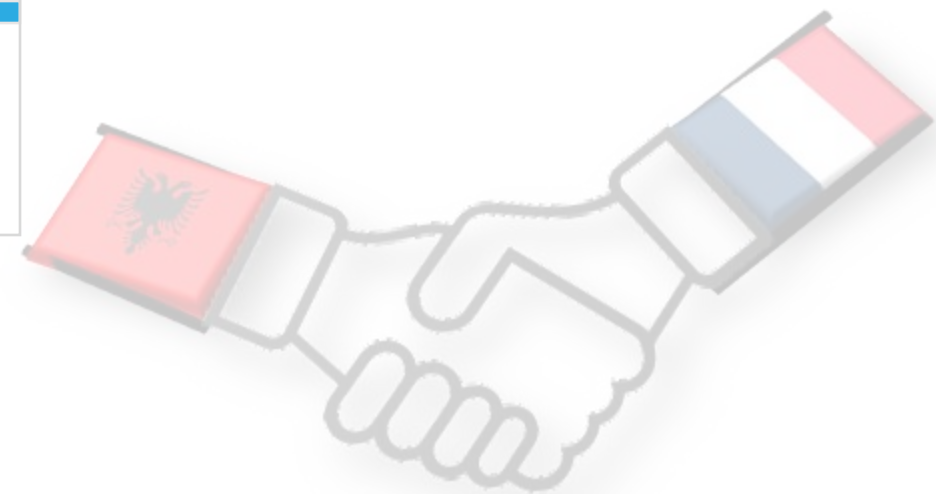
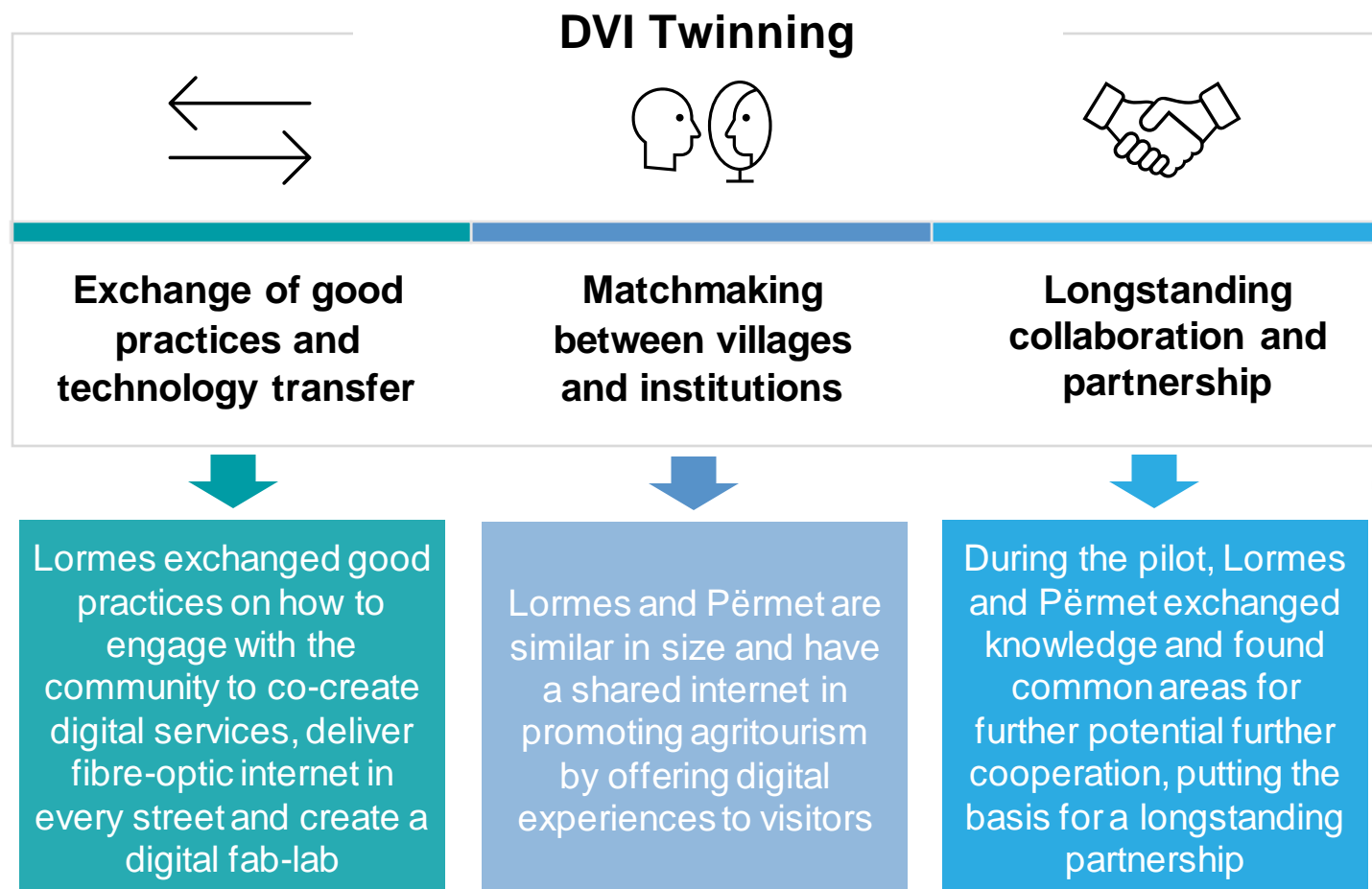
Map No. 3769 Rev. 7 UNITED NATIONS June 2012 Department of Field Support Cartographic Section

Source: own elaboration, based on UN Geospatial, accessed in May 2023



# DVI Twinning pilot

*A twinning pilot exercise between Përmet (Albania) and Lormes (Smart Village of France)*





# DVI in Bosnia and Herzegovina

**Grujica Vico**

*Digital Villages Specialist*

FAO Bosnia and Herzegovina



# Tropojë: Albania's DVI in Action

*Tropojë was selected as Albania's DVI in action under the FAO technical cooperation programme*



## Digital marketing for agritourism

Develop capacities in the community to promote their touristic and culinary attractions through social media and digital marketing



One Country  
One Priority Product

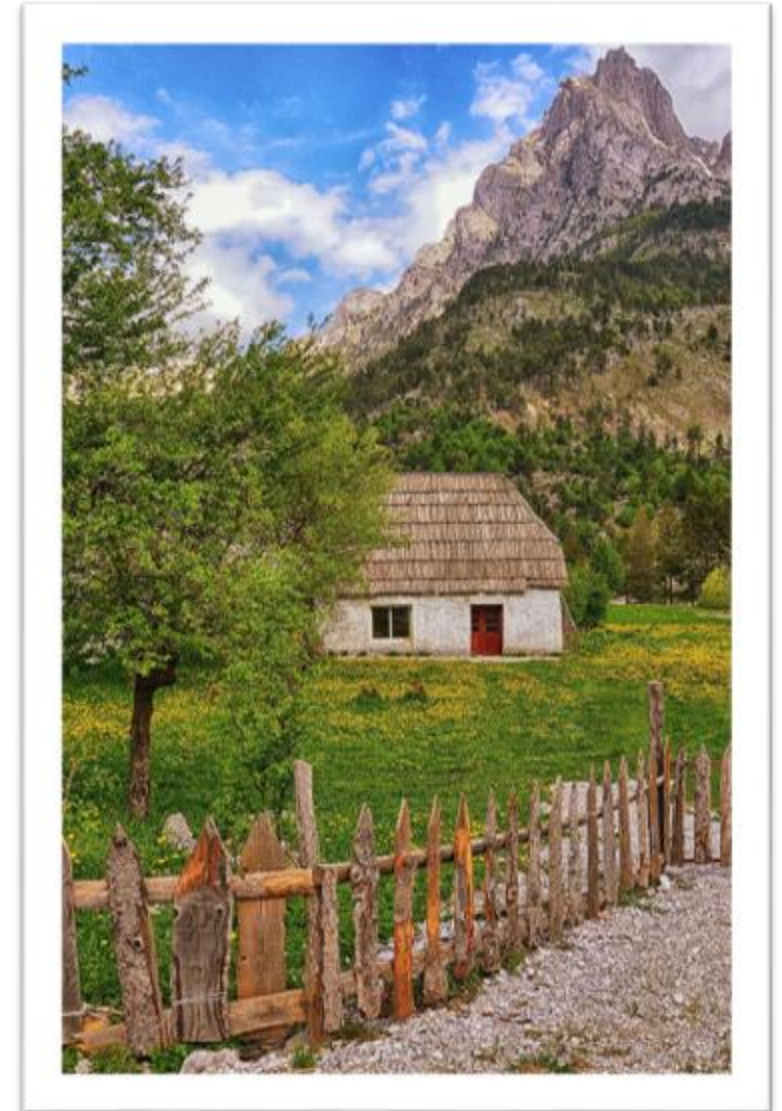
## Chestnut value chain traceability

QR codes or blockchain could trace products and producers, increasing the transparency and quality of chestnuts and potentially leading to GIs



## Better connecting producers

Digital platforms can better connect producers with buyers and suppliers, shortening the value chain and leading to increased efficiencies

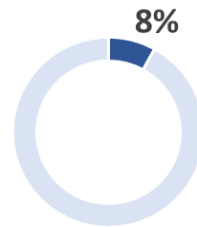


©Pasztila aka Attila Terbócs – Own work, CC BY-SA 4.0

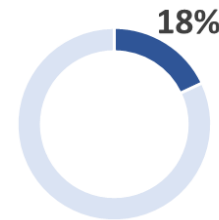


# State of digital agriculture in Bosnia and Herzegovina

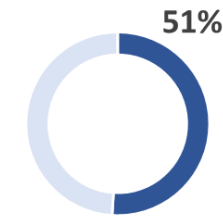
## Agriculture gross value added



## Agricultural employment



## Rural population



## DIGITAL DEVELOPMENT

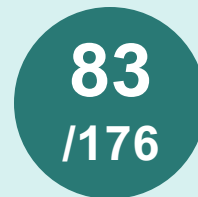
Early stages



Agricultural digitalization index

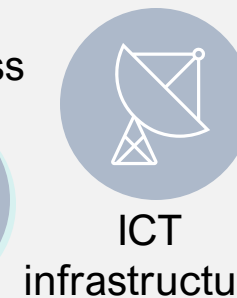


ITU ICT develop. rank

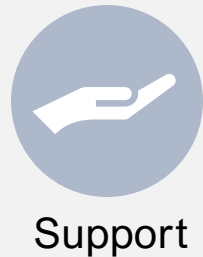


## BARRIERS

Awareness



Skills & knowledge



Investment power



# E-agriculture strategy in Bosnia and Herzegovina



**STRATEGIC VISION:** By 2027, Bosnia and Herzegovina will have complied with all requirements regarding the European Union accession process in terms of digitalization of agriculture to ensure a higher level of productivity and efficiency in agriculture



Accelerating digital transformation of agriculture in the **public sector**



Improving **digital infrastructure** in rural areas



Practical use of ICT solutions at **farm level**



Development of **institutional and individual capacities** on digital agriculture

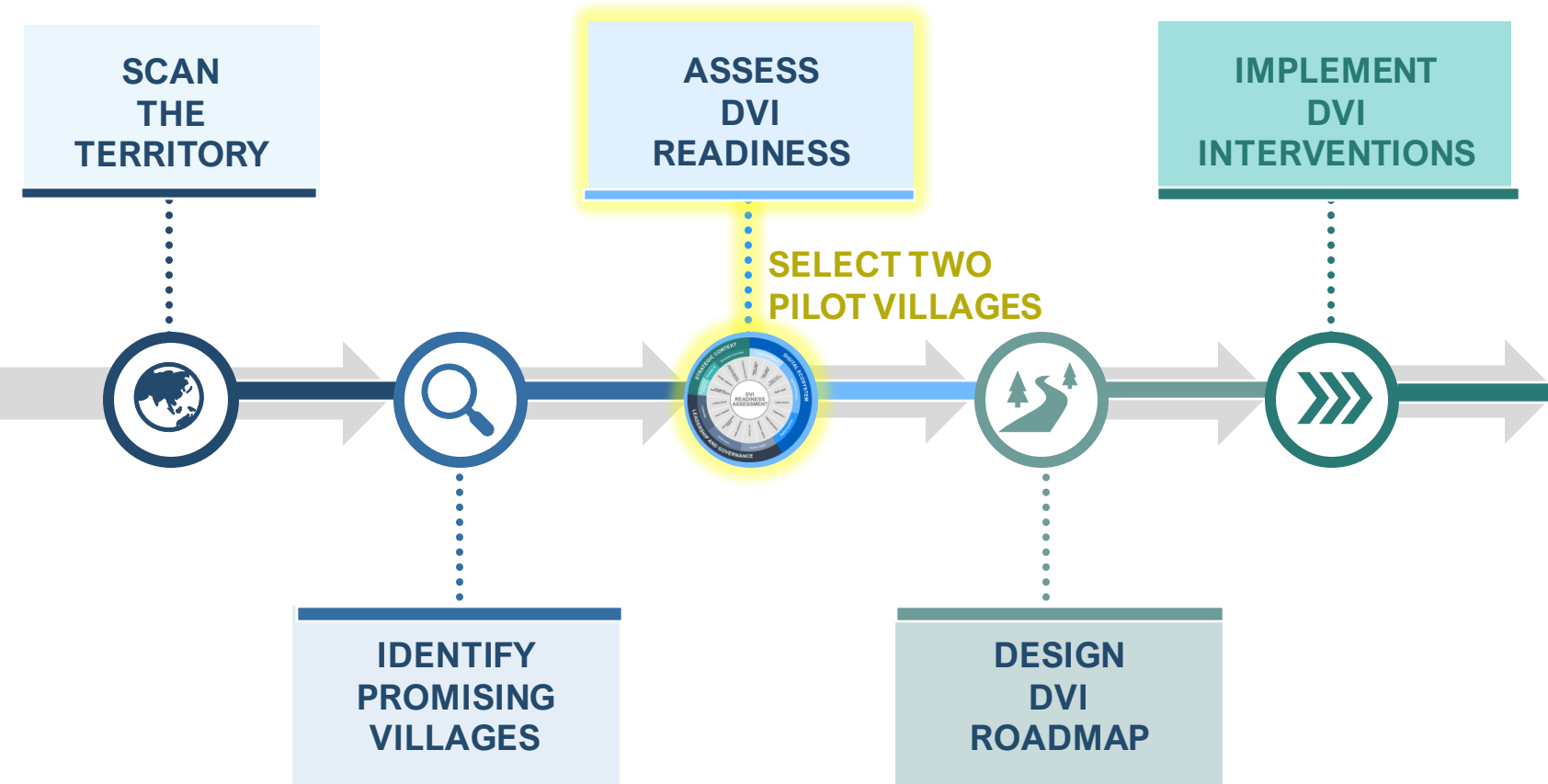


Raising **awareness** on the benefits of implementing ICT solutions in agriculture

*25 practical actions for implementation*



# DVI Readiness Assessment in Bosnia and Herzegovina





# DVI in Georgia

**Dragan Angelovski**

*Technical Adviser, FAO Georgia*



# Tracing animals with NAITS

*National animal identification, registration and traceability system  
of the Food Agency of Georgia*



**Food and Agriculture  
Organization of the  
United Nations**

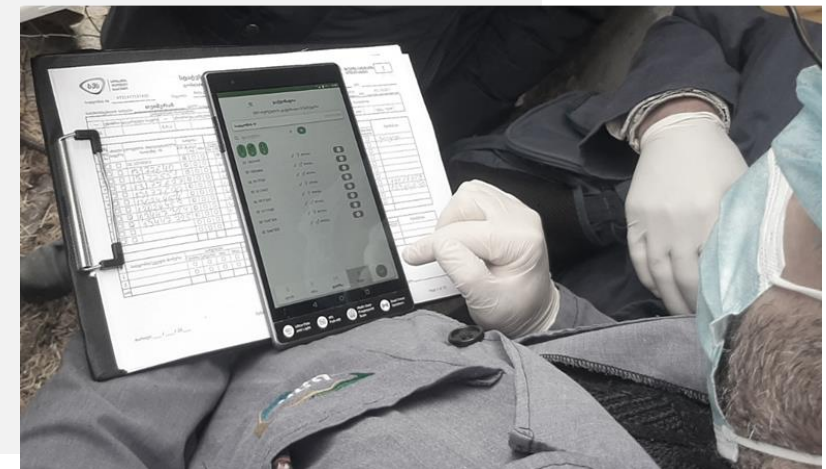


Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

**Swiss Cooperation Office  
South Caucasus**



**AUSTRIAN  
DEVELOPMENT  
COOPERATION**



1,8 million USD



Experience and expertise  
from 9 countries

*Albania, Bulgaria, France, Austria, Lithuania, North  
Macedonia, Serbia, Switzerland, Zimbabwe*

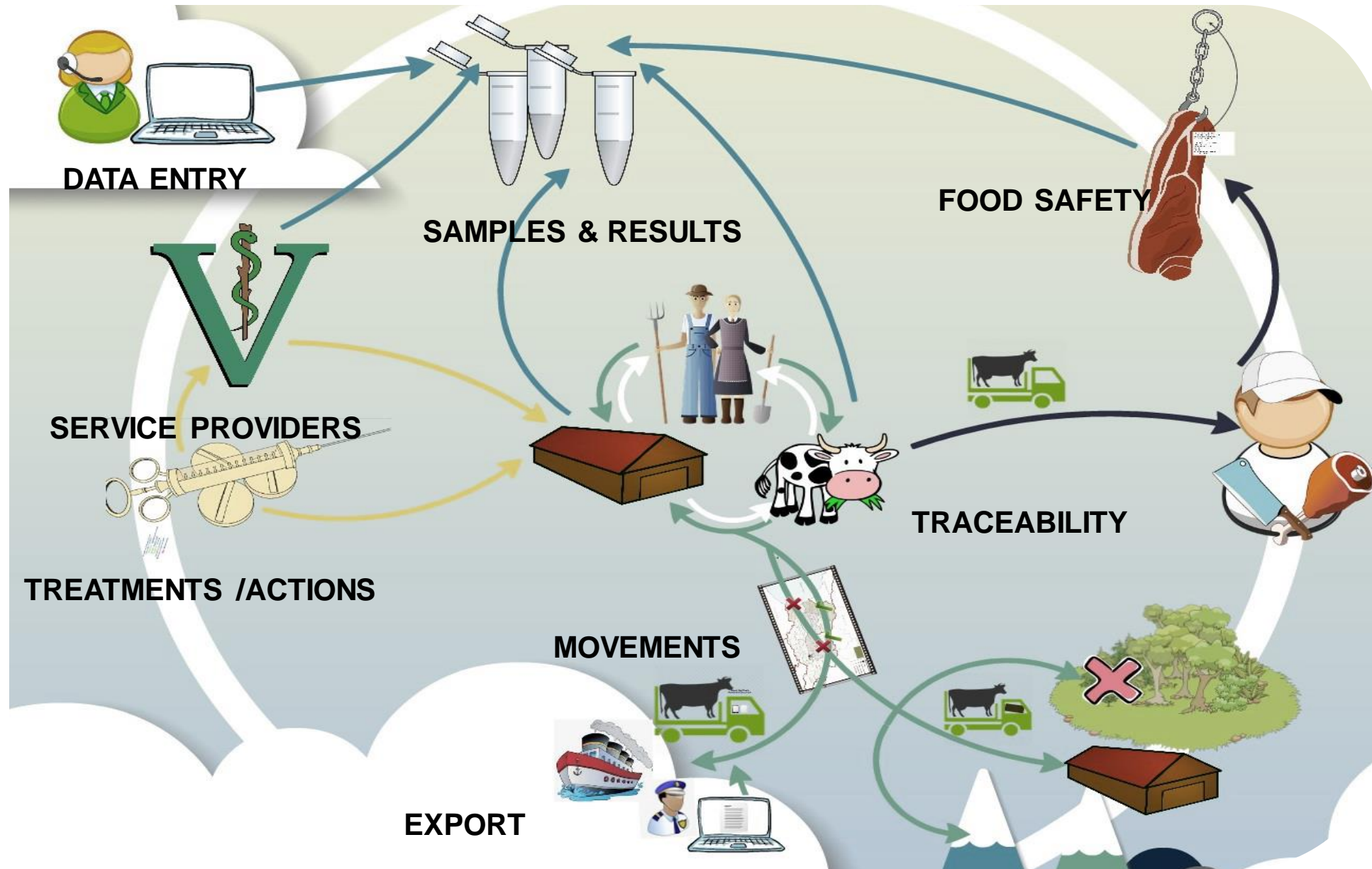


Peer reviews 4 countries

*Germany, United Kingdom of Great Britain and  
Northern Ireland, Netherlands, Côte d'Ivoire*

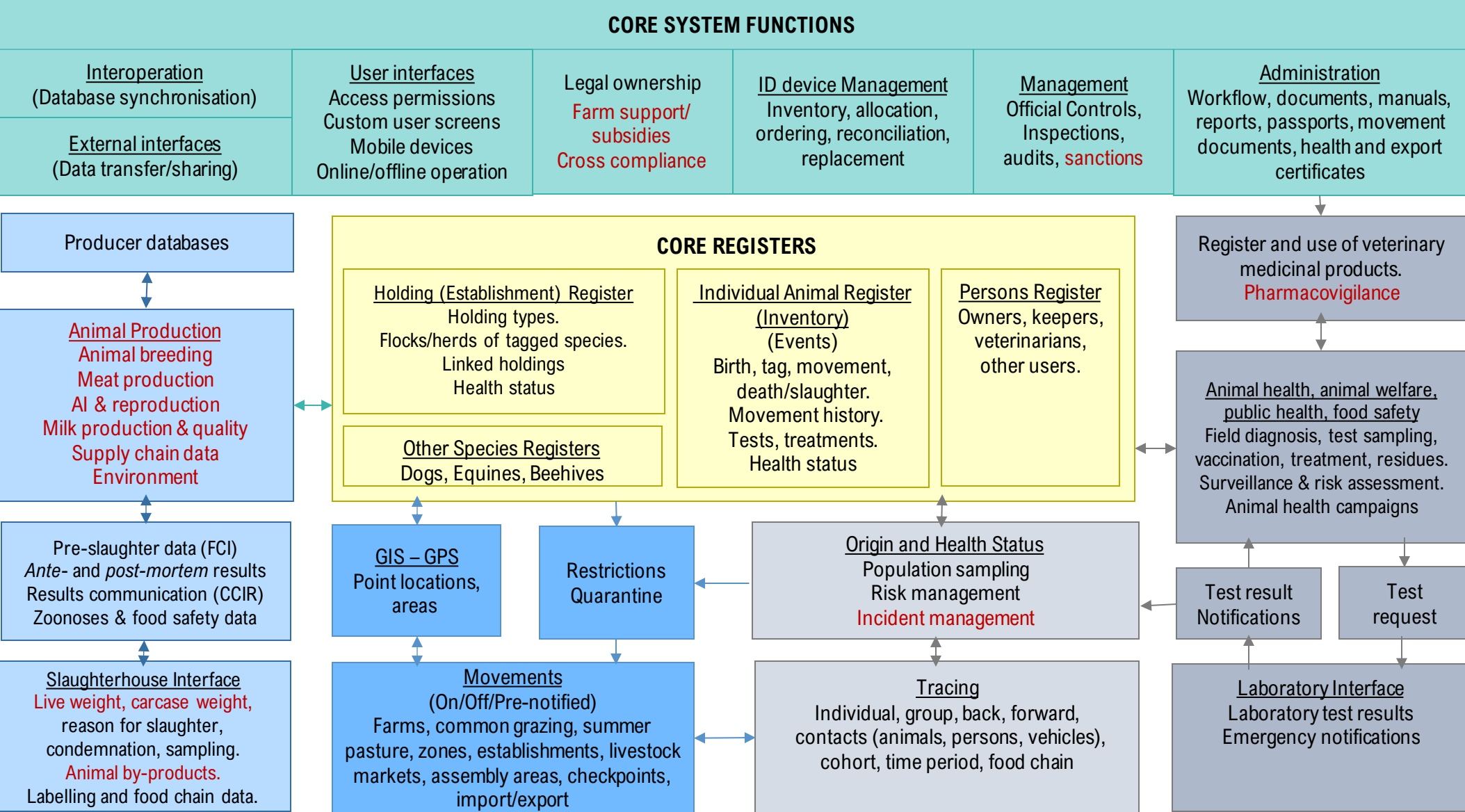


**DIGITAL VILLAGES IN ACTION**  
Europe and Central Asia

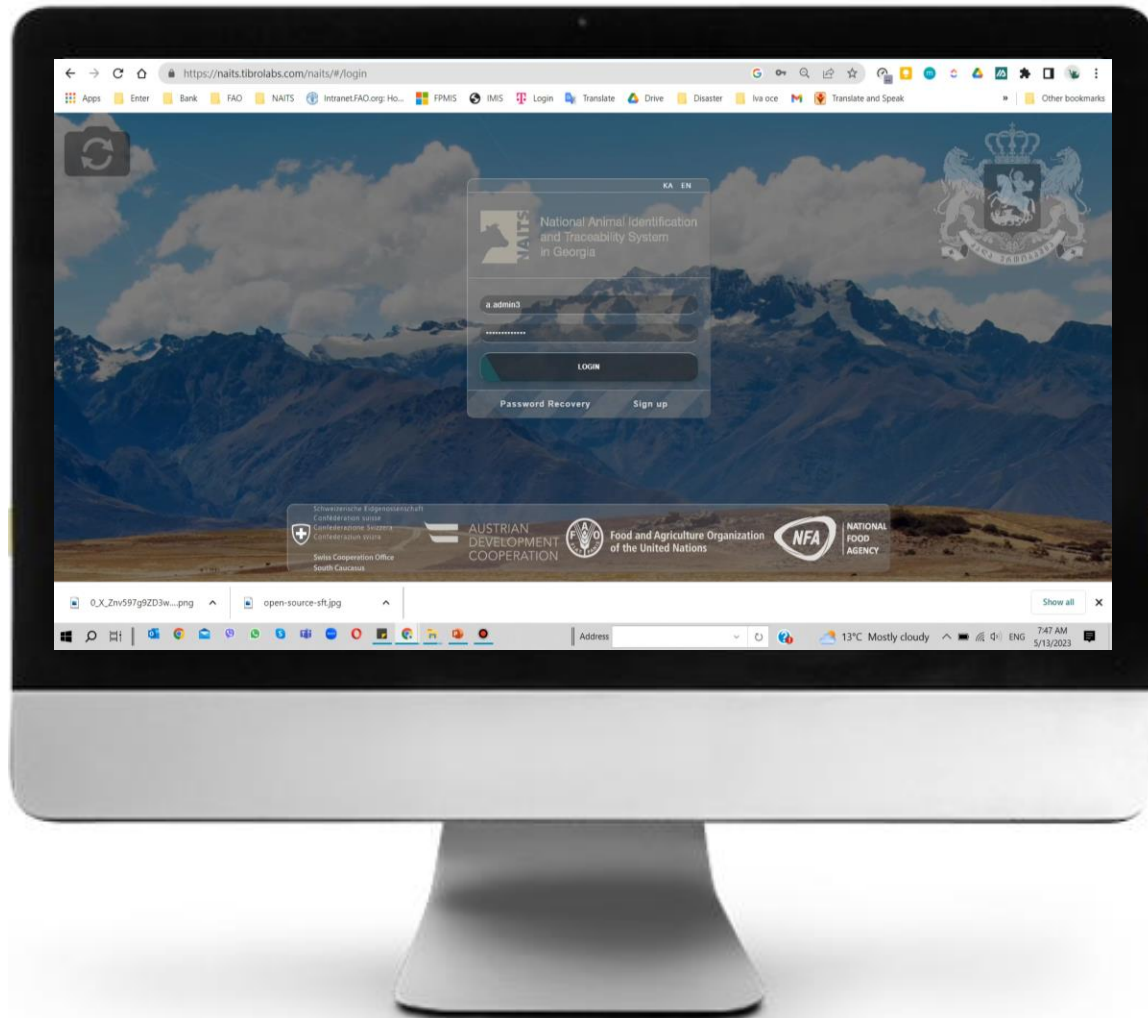




# Reference model for a multi-species NAITs



# Platforms



Multilanguage support + Google Translate



Dynamic browser design



3 environments (development, test, production)



Access to 12 types of external stakeholders



# Technology stack



**open source**

Java

Apache

PostgreSQL

Android

MediaWiki

Python

**Apache License**



# NAITS as a global digital public good

*NAITS is being transferred to 8 countries worldwide at a marginal cost of its original cost*



**Transfer cost:**  
20k-100k USD



**Maintenance cost:**  
180-2k USD/month



# From NAITs to a farm management system

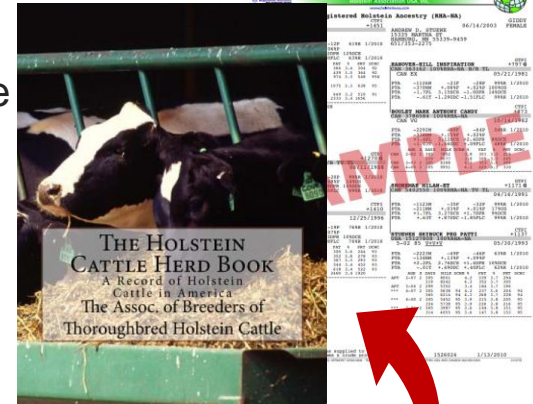


## Records

- Productivity
- Feeding
- Inventory
- Costs/Incomes
- Reproduction
- Services

## Registers

- Breed Certificate
- Herd book
- Pedigree



	Blood Measure		Emotions Data
Farm 1			Weight
Cow A			Height
			Respiration Rate



*Farm analytics*

A woman wearing a purple long-sleeved dress and a matching headscarf is looking down at a smartphone she is holding in both hands. She is standing in a kitchen or dining area. In the foreground, there is a round table with a patterned tablecloth, and on it sits a white plate with a large, round, white loaf of bread. The background shows a window with a view of trees and a potted plant on the sill.

# DVI in Türkiye

**Frank Hollinger**

*Senior Rural Finance Officer*

FAO Investment Centre

# FAO digital agriculture projects in Türkiye

FAO has supported Türkiye in the field of digital agricultural technologies in various ways, including:



## National E-agriculture strategy (2021)

With the 'Support to Develop National E-Agriculture Strategy' project, a national e-agriculture strategy and vision was elaborated by the Ministry of Agriculture and Forestry with the support of FAO.



## Dissemination and adoption of digital technologies (2022)

Contribute to the design of activities to support the dissemination and adoption of digital technologies under the TUCSAP project funded by the World Bank (effective in 2022)



## FAO-EBRD Review on the state of digital technologies (forthcoming)

The study identifies the main technologies currently used, including the most prominent use cases, users and adoption levels, drivers for and barriers to adoption, issues as challenges in practice.



## Women e-commerce cooperatives (2022)

Women cooperatives from 10 provinces operate under the brand name "Hep Yerinden" and work together to establish a permanent market in the digital world, developing common strategies.



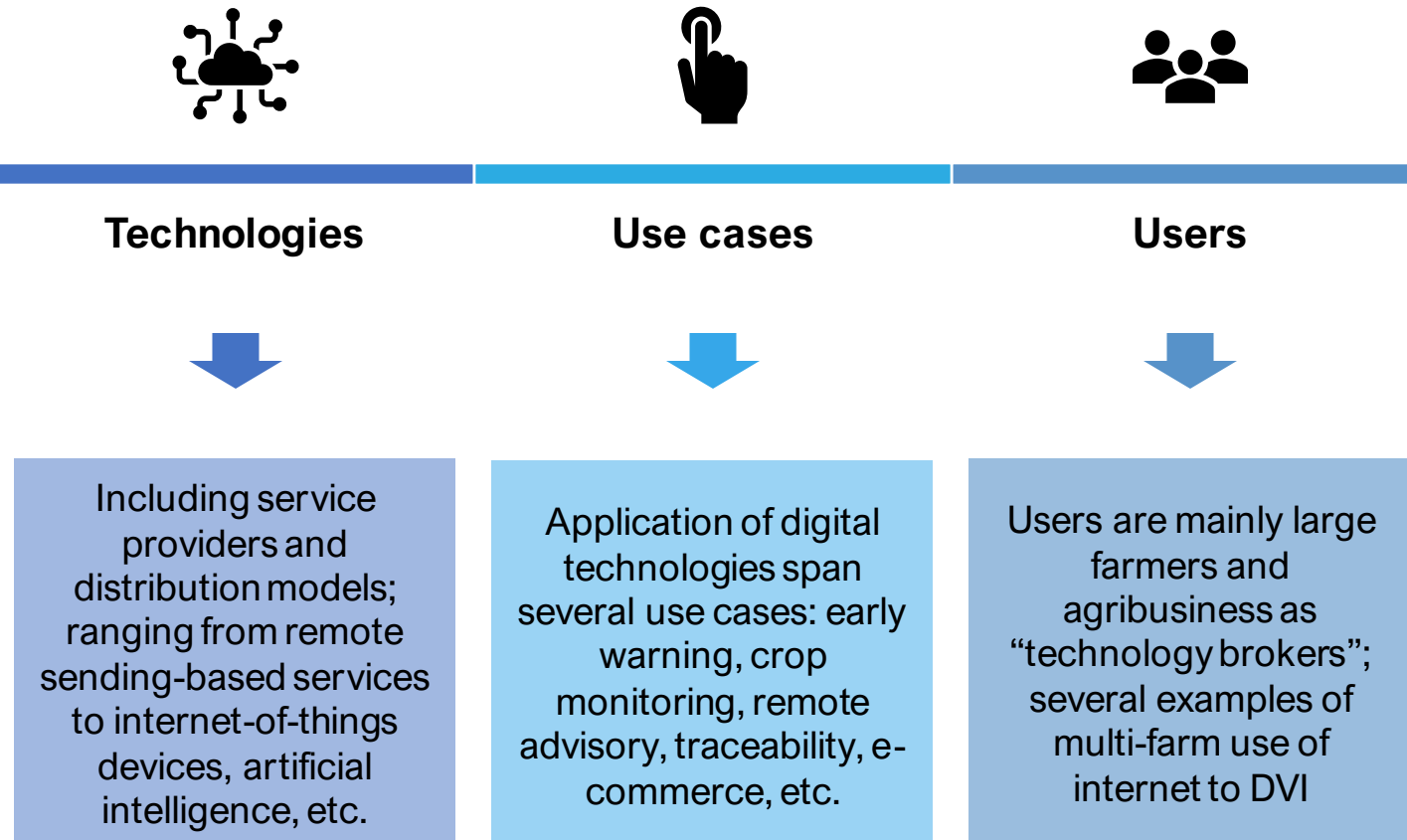
## Digital Villages Initiative (starting)

With the regional technical cooperation programme "DVI in Action", FAO will provide technical assistance to develop a pilot digital village in Türkiye. Three villages have been assessed so far.



# A growing sector facing numerous challenges

*Availability of digital technologies and solutions in agriculture are growing quickly but uptake is still limited*



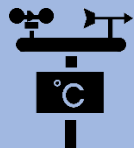
From top left to bottom right: ©Engr Fahad; ©Metos\_IBERIA; ©meteoblue





# Multi-farm use covering smallholder farmers

*An example of multi-farm use covering smallholder farmers*



## Digital weather stations

Early warning systems and remote farm advisory services

Kemalpasa Chamber of Agriculture  
Cherry growers Manissa MOAF  
Grape growers

Improved timing of agronomic practices  
Reduced pesticide applications (up to 30%)



## Digital insect traps

Early warning and remote monitoring

Provincial Directorates of MOAF  
Large cooperatives

Reduction of pesticide application



## Soil moisture sensors

Smart irrigation in orchards

Medium and large orchard growers

Reduction of water consumption and energy use (up to 30%)



# Challenges and opportunities for DVI

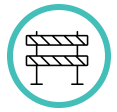
*There are several challenges and opportunities for DVI implementation in Türkiye*



Need for training and capacity development at all levels



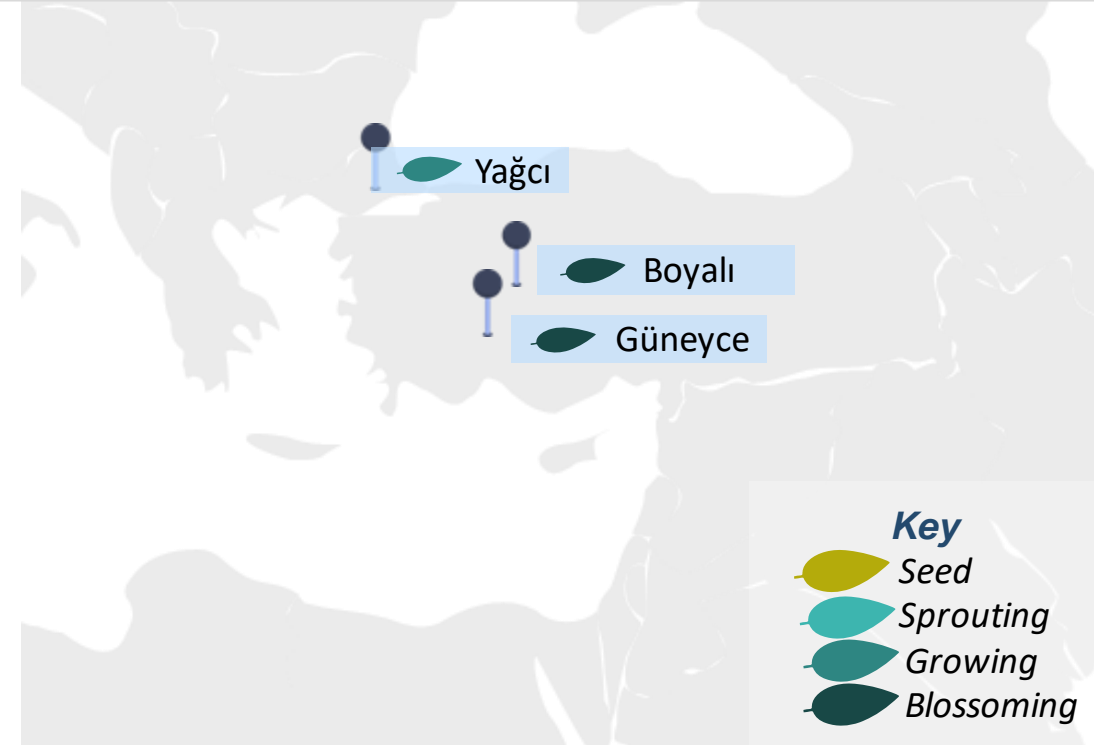
Develop viable business models for AgTech providers (tech sharing, service provider models)



Evidence on drivers and constraints to adoption, cost-benefit for different users under different conditions



Innovations for downscaling of technologies



# Stay tuned on our webpage!

<https://www.fao.org/digital-villages-initiative/europe/>

[REU-Digital-Agriculture@fao.org](mailto:REU-Digital-Agriculture@fao.org)



**DIGITAL VILLAGES IN ACTION**  
Europe and Central Asia

The screenshot shows the FAO website page for the Digital Villages Initiative in Europe and Central Asia. The page features a navigation bar with the FAO logo, the text 'Food and Agriculture Organization of the United Nations', a 'Discover' dropdown menu, and language options for 'English'. The main heading is 'Digital Villages Initiative in Europe and Central Asia'. Below this, there is a 'Featured Stories' section with three articles:

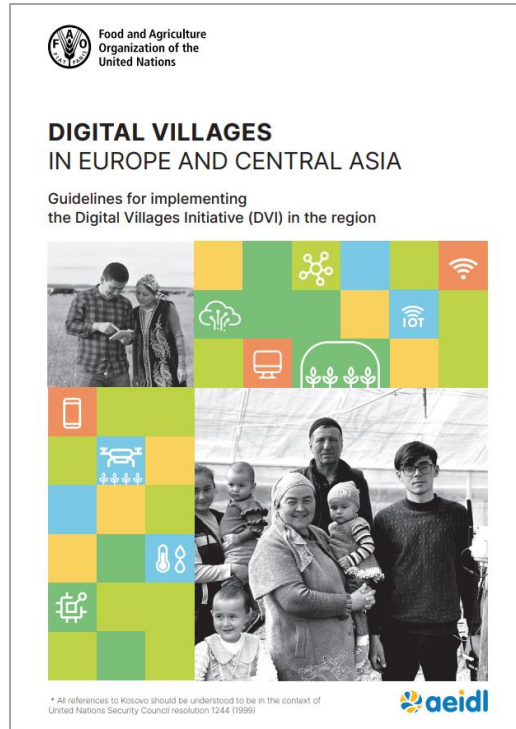
- Advanced weather data for smallholders in Tajikistan** (20/04/2021): Farmers in Tajikistan are benefiting from weather stations gathering important climate data and producing advanced agrometeorological information for...
- Smartphones are boosting gender equality in Georgia** (07/03/2023): The use of social media is transforming people's lives, including in small villages like Malika's. By communicating through social media and messaging...
- Smart farming** (20/10/2022): Raising greenhouse level with high-quality ser source technology phone interface...

On the right side, there is a 'CONTACT' section for Daniela Di Gianantonio, Digital Agriculture Team Leader, with the email address reu-digital-agriculture@fao.org. Below this is a 'Related links' section with several links to related resources and regional offices.

The 'Featured Videos' section at the bottom displays four video thumbnails:

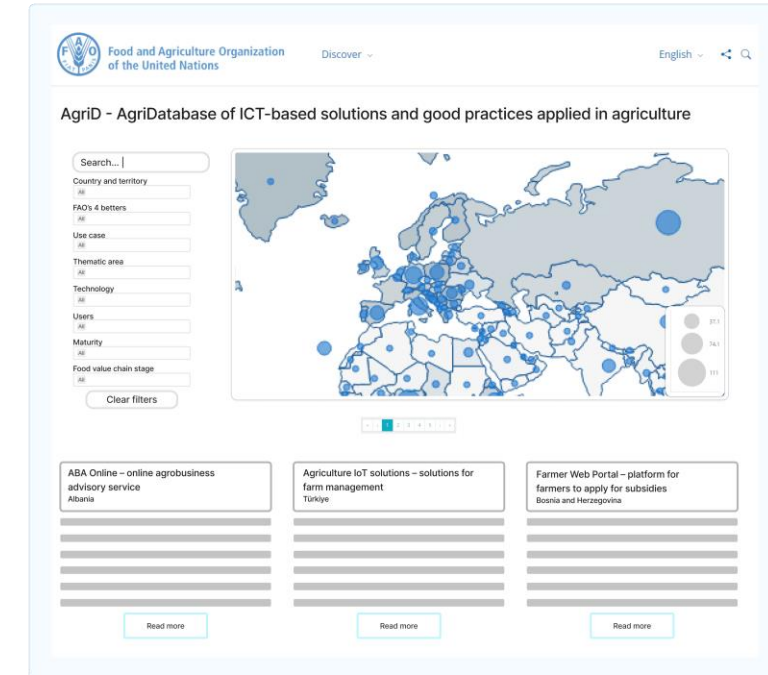
- Improving traditional livelihoods with modern technology in Kazakhstan** (13/04/2023): In Kazakhstan, approximately 2 million families earn a living in the dairy sector. 80 percent of all milk in Kazakhstan comes...
- Smartphones: A new agricultural tool for women in Georgia** (13/04/2023): Nestled in the vast plains of Georgia, in the shadows of the snow-covered Caucasus mountains, Malika Machalikashvili's farm in Pankisi Gorge was once...
- Street art promoting National Animal Identification and Traceability System** (30/10/2018): FAO in Georgia implements National Animal Identification and Traceability System (NAITS), funded by the Swiss Agency for...
- Vision for the Future: Transition to Digital Agriculture International Conference Azerbaijan** (13/04/2023): Organized by the Ministry of Agriculture of the Republic of Azerbaijan and with...

# Coming soon!



## Guidelines for implementing the Digital Villages Initiative in Europe and Central Asia

**DVI Readiness Assessment Tool**  
on our website soon  
<https://forms.office.com/e/a9hrpyTGix>



## AgriD – agriDatabase of digital solutions and practices stemming from Europe and Central Asia



**DIGITAL VILLAGES IN ACTION**  
Europe and Central Asia



Food and Agriculture  
Organization of the  
United Nations



# Thank you!

